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Can the president really affect economic growth? Presidental effort and the political business cycle

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CAN THE PRESIDENT REALLY AFFECT ECONOMIC GROWTH? PRESIDENTIAL EFFORT AND THE POLITICAL BUSINESS CYCLE

CHRIS ROHLFS, RYAN SULLIVAN and ROBERT MCNAB*

Presidential elections are often seen as referendums on the health of the economy; however, little evidence exists on the president's ability to influence gross domestic product (GDP). This study examines the effect of the incentive to be reelected and the resulting increase in presidential effort on GDP growth. Growth is found to rise in reelection years for first-term presidents after 1932 and to fall in election years before 1932, when reelection was uncommon, and for second-term presidents generally. This effect is largest for high-quality presidents—who probably have the highest return to effort—and is spread across multiple sectors of the economy. (*JEL* D78, D72, E32, J24)

I. INTRODUCTION

Presidential election is often seen as a referendum on the performance of the economy. Ronald Reagan won the presidency in 1980 with a campaign that asked the question, "Are you better off now than you were 4 years ago?" and Bill Clinton's 1992 campaign centered on the reminder, "It's the economy, stupid." Mitt Romney, the 2012 Republican Presidential nominee, campaigned on his business acumen, strong economic performance of Massachusetts while he was governor, and his ability to "turn the economy around" (Lowry 2012). These slogans and arguments reflect the widespread belief among voters that economic growth is substantially affected by actions taken by the president.

Extensive research has shown that economic factors affect votes to reelect a president (Fair 1996; Silver 2011), but little concrete evidence exists on the causal relationship between presidential actions and economic performance. Assassinations of country leaders do not affect long-term economic growth (Jones and Olken 2009) and changes in the presidency in the United States do not appear to significantly influence growth in gross domestic product (GDP) (Alesina and Rosenthal 1995).[1] Historians rank presidents based partly upon their ability to manage the economy (Schlesinger 1997; Wikipedia 2011). Economic performance varies widely from year to year, however, and executives who presided over periods of growth may have simply been lucky. The degree to which GDP responds to presidential behavior is of enormous practical importance to voters and policymakers and for general understanding about how the economy functions.

This article uses a novel estimation strategy to measure the extent to which a president's actions influence economic growth. If governors and mayors, for example, exert effort to hire additional police officers during reelection years (Levitt 1997), then we may reasonably argue that presidents may exert effort to improve GDP growth in similar circumstances. Additionally, unlike unemployment, which is constrained by the "stickiness" of the labor market, GDP growth may be relatively malleable in the short term, as it can be affected by changes

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1. We should note that Alesina and Rosenthal's work does not differentiate between high- and low-quality presidents, and it is not clear by how much or in what direction one might expect growth to change after specific changes in presidents.

ABBREVIATIONS

GDP: Gross Domestic Product
GNP: Gross National Product
OLS: Ordinary Least Squares

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in hours per worker or usage of existing equipment. In a reelection year, the president faces an incentive to divert energy away from other objectives (e.g., improving national security) and toward increasing economic growth or to time growth-inducing policies to take effect in election years. Given modern term limits, this incentive only applies to first-term presidents. If the president's effort and policies influence economic growth, we should see especially high levels of growth in election years for first-term presidents, and we should observe no such effect among second-term presidents.

A large literature exists on the "political business cycle," and the extent to which growth rises in election years. Previous work on the United States has generally used data from only a few decades and has found mixed results, with some researchers finding large effects (Drazen 2000; Grier 2008; Nordhaus 1975) and others finding no such effect (Alesina, Roubini, and Cohen 1997). Those who find an effect attribute it to "artificial" increases caused by monetary or fiscal policy. However, such studies have failed to identify robust election cycles in inflation or government spending or evidence of post-election year crashes (Alesina et al. 1997 and Drazen 2000 provide reviews). This study is the first to propose that the election year effect reflects a true increase in economic performance that is caused by an increase in presidential effort. Unlike in previous studies, data are used on every U.S. president from George Washington to Barack Obama. New cuts of the data are presented to examine how this effect varies over time, with the characteristics of the president, and across sectors of the economy. Unlike in many of these previous studies, the regressions presented here do not control for potentially endogenous macroeconomic variables and focus purely on the essentially random cyclical variation in election years.

While somewhat imprecise, the estimates indicate that increased presidential effort in election years leads to substantial increases in growth. For first-term presidents since 1933, real GDP growth has been from 1.0 to 2.7% percentage points higher in the third and fourth years of office than in the first 2 years. This effect matches up roughly with the election cycle, beginning 1 year before the election in the third quarter of the third year. No crashes occur immediately afterward in the beginning of presidents' second terms, and no election year effect appears for second-term presidents. In some specifications, growth declines significantly in the fourth year of the second term, when the president's departure is imminent. A similar negative effect of election years is observable from 1837 to 1932, when reelection was uncommon, and for second-term presidents from 1791 to 1836.[2]

This article also provides suggestive evidence that, contrary to findings by Alesina and Rosenthal (1995), the competence of a president is a substantial predictor of growth and interacts with effort. One might expect the returns to effort to be increasing in the ability of the president, so that the positive effect of election years on growth would be larger for more capable presidents than for less capable ones. It is difficult to measure this difference in an objective way, as historians' rankings of presidents may be biased by random factors that influenced growth in the presidents' terms and made certain presidents appear to be particularly effective or ineffective in managing the economy. Using this measure, however, produces the result that GDP growth and the effect of election years are substantially higher for high-quality presidents than for low-quality ones. Effort might also be expected to be more effective when the president's party has majorities in the House of Representatives and the Senate. The data provide suggestive evidence to support this view, and growth is higher and the electoral cycle is clearer for presidents whose terms began with undivided governments than for those beginning with divided governments. One might also expect the amount of effort that a president exerts to be greatest for elections that are expected to be close. In the data, however, the effect of election years on growth is larger for those who won their first elections handily than for those whose initial elections to office were close.

It is not clear how, exactly, the effort of a presidential administration translates into results. We find that the effect of reelection years on growth is spread across multiple sectors, with the largest effects in the services and government sectors, smaller effects in the finance, insurance, and real estate and wholesale and retail trade sectors, and

2. These negative effects provide evidence to support the view that the correlation between growth and the election cycle is primarily attributable to effort and not due to presidential learning. If growth increased over the election cycle primarily due to presidential learning, then we would expect it to rise continuously into the second term. Growth is somewhat higher during presidents' second terms than during their first terms, which lends suggestive support to the view that presidential learning affects growth as well.

large negative effects in the manufacturing sector. Given the decline in manufacturing and the rise in services, the actions taken by the president might include policies to modernize the economy through building infrastructure and establishing rules and property rights for new markets. Some of the relevant actions may have also involved trade agreements, deregulation, or tax reductions. Recent evidence indicates that considerably more laws are passed in election years than in other years (Fritze 2010). This effect of effort does not appear to be associated with a single common strategy that can be measured in macroeconomic data. The rise in growth is not accompanied by rises in inflation or in the growth rate of government spending or private investment, although federal spending appears to shift slightly away from national defense.[3] There is some evidence of a reduction in unemployment in reelection years—an effect that may also result from efforts made by the president.

TABLE 1
Rates of Party Nomination and Reelection Among First-term Presidents by Time Period

	(1) 1789–1836	(2) 1837–1932	(3) 1933–2008
Ran in general election	1.000	0.550	0.917
Won reelection	0.714	0.300	0.667
Index of president quality (0–1)	0.779	0.407	0.581
Observations	7	20	12

Notes: Information on party nominations and elections taken from 270toWin.com (2011), U.S. Census Bureau (2014), and U.S. White House (2011c). Index on quality is based upon historians' rankings (the weighted average of rankings presented in Wikipedia 2011), which range from 1 to 43. The index is 43 minus the ranking, all divided by 42. Calvin Coolidge's and Lyndon Johnson's second terms are classified as first terms, because Johnson was eligible for a second reelection and Coolidge would have been under the provisions of the 22nd Amendment. Only presidents who survived until reelection are included in the sample.

II. A BRIEF HISTORY OF THE PRESIDENTIAL ELECTION PROCESS

The time-series data in this study are divided into three eras, based upon changes over time in the likelihood of reelection. Table 1 shows the fraction of first-term presidents who ran for reelection in the general election, the fraction who won reelection, and an index of historians' judgments of president quality for three separate eras in American history. In the first era, from George Washington in 1789 through Andrew Jackson in 1836, every first-term president ran for reelection in the general election, and 71.4% were reelected. The average of the zero-to-one index of quality for this era is 0.779. In the second era, from Martin Van Buren in 1837 through Herbert Hoover in 1932, all three variables are considerably lower. Only 55.0% of first-term presidents from this era ran for reelection in the general election, only 30.0% were reelected, and the average rating of quality was 0.407. Grover Cleveland, who was unseated after his first term but won 4 years later, is coded as having run but not won reelection. Primary elections did not occur in the early years of the country, and candidates from the same party sometimes ran against one another in the general election. Parties gradually developed nominating processes over the 1800s and 1900s, and a few states held the first informal primaries in 1912. The nominating process became solidified in 1972, when all of the state parties agreed to formal, binding primary votes (Berg-Andersson 2004; Coleman 2008; Reiter 1985, 1996; U.S. White House 2011c).

In the third era, from Franklin Roosevelt in 1932 through George W. Bush in 2008, the rates of being nominated by one's party and winning reelection and ratings of president quality are considerably higher than in the second era. This change may have been driven by the increased prevalence of primary voting and the increased ability of sitting presidents to reach wide audiences through the media. Radio and television are known to have played a substantive role in increasing the American public's awareness and fostering their engagement with national issues such as politics and the economy. While both technologies were first invented in the 1920s, the "golden age" of radio, when the medium reached its peak popularity, is generally thought to be in the 1930s and 1940s, after which it was replaced by the television (Finkelstein 2000; Hilmes 2011). The radio's use as a political tool coincided with its rise

3. One variable that comoves with the election cycle is the electoral cycle for Congress. Between the second and third years of a president's term, the likelihood that the president's party controls the Senate declines from 0.70 to 0.60, and the likelihood that the president's party controls the House of Representatives declines from 0.65 to 0.40. This drop occurs for both first- and second-term presidents, however, and it is not clear how having a divided government would foster immediate growth. For these reasons, presidential effort appears like a more plausible explanation for the patterns observed in the data. Data taken from U.S. House of Representatives (2011) and U.S. Senate (2011).

as a medium of entertainment, as evidenced by Franklin Roosevelt's "fireside chats," which began in 1933 (Buhite and Levy 2010). The division between the second and third eras is selected to coincide with these fireside chats.

Prior to Franklin Roosevelt's four-term presidency from 1932 to 1945, the Constitution included no term limit on U.S. presidents; however, no president before Roosevelt had served more than two terms. Congress amended the Constitution in 1951 to limit presidents from serving from more than two terms. A president who ascended to office due to the death of the previous president may serve three terms, provided that the first term lasted less than 2 years. Harry Truman, who was president at the time, was specifically exempted from this term limit; however, after losing the primary in New Hampshire, he chose not to pursue a third term (David 1954; U.S. Constitution 1947). Since 1932, only one other president, Lyndon Johnson, was eligible for reelection and did not win the nomination; Johnson served over two terms from 1963 to 1968 but was eligible for a third. Of the 11 presidents who served since 1932 and survived to reelection (with Johnson counted twice), two-thirds won reelection, and the average quality rating was 0.581.

III. GDP GROWTH AND THE ELECTION CYCLE

A. A. Main Findings

This section examines the main empirical question of the article—the extent to which real GDP growth increases during presidential reelection years. For presidents in the modern era, from 1933 to the present, election years are found to substantially affect growth, which is more than 1 percentage point higher in the later 2 years of a typical presidential term than in the first 2 years. Results from quarterly data indicate that this increase in growth begins in the second half of the third year—the half of that year that matters most for the election cycle. In the first era from 1791 to 1836, when voters typically did not have information on nationwide economic conditions, we observe the opposite result, with growth rates declining substantially over a presidential term. This negative effect also appears in the second era from 1837 to 1932, when reelection was uncommon.

The increase in growth in election years in the modern period only appears for presidents' first terms in office. For presidents' second terms, depending on which dataset is used, growth is steady over the second term or falls in the fourth year—a result that is consistent with a decline in presidential effort near the end of the second term, just before leaving office. For two-term presidents in the first two eras, the pattern is the same as for the modern era, with growth rising in the reelection year at the end of the first term and falling near the end of the second term.

B. Detailed Evidence

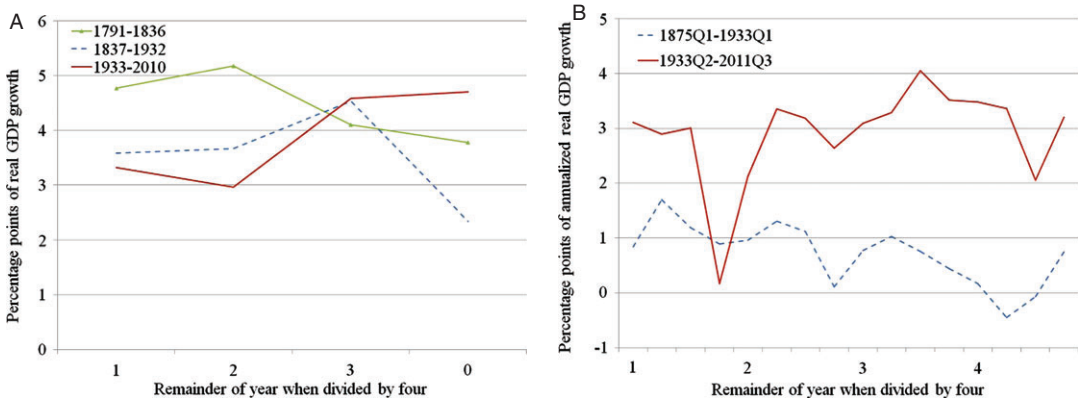
Figure 1A shows how annual GDP growth varies with the election cycle for each of the three eras described in Table 1. Percentage points of real GDP growth are plotted along the vertical axis, and the horizontal axis plots the remainder of the year after dividing by four, or mod(year,4). Presidential years, which are divisible by four, appear on the right of the graph. The averages by mod(year,4) and era are computed over the full 221-year range of available data. Growth for the first era is shown by the solid green line. Growth for the second era is shown by the dashed blue line, and the solid red line plots growth for the third era. While the GDP data from the first two eras (prior to 1932) are the best available, it should be noted that they are highly imprecise and rely upon a combination of annual data for some sectors (such as agricultural and industrial output) and interpolated data for others. For the interpolated sectors, constant growth rates are assumed between decennial censuses.

In the first era, reelection was common, but voters did not have access to information about the state of the national economy. In this period, we observe a negative pattern over the election cycle, with growth rates around 5% in years 1 and 2 and around 4% in years 3 and 4. We observe a sharper election cycle in the second era, when reelection was rare. Growth rates rose slightly from 3.7% to 4.5% in year 3 and dropped sharply to 2.3% in year 4. For the third era, when reelection was common and GDP data were typically available, we observe a very different pattern, with a sharp increase in growth from 3.0% in the second year of a term to 4.6% and 4.7% in years 3 and 4. A similar switch from a negative to a positive election year effect appears if the third era is defined to begin in 1929 with Hoover, in 1945 with Truman, or in 1953 with Eisenhower.

Figure 1B uses quarterly data to present a more detailed view of the election cycle in GDP

FIGURE 1

Real GDP Growth and the Presidential Election Cycle. A. Annual Growth, 1791–2010. B. Quarterly Growth, 1875:Q1–2011:Q3



Notes: Annual growth data are calculated using real GDP data from 1790 to 2010 from MeasuringWorth (2014). Quarterly real GDP growth data from 1949:Q1–2011:Q3 are taken from U.S. Bureau of Economic Analysis (2011). Real GNP growth for 1875:Q1–1948:Q4 is calculated using real GNP data from Gordon (1986).

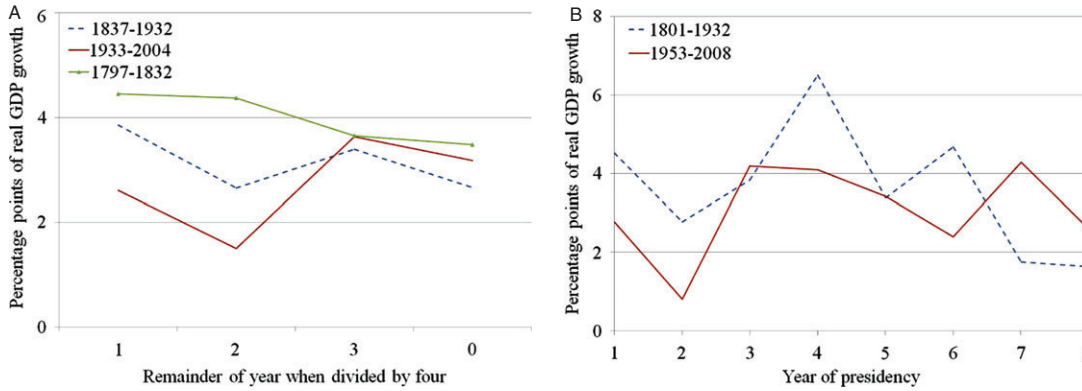
growth than can be seen in Figure 1A. These data begin in 1875:Q1, so that the first era cannot be shown; the data continue through 2011:Q3. As with the annual data, these quarterly data are imprecise for the earlier dates (prior to 1947) and use a combination of annual information on some sectors (such as agricultural and industrial output) and interpolated data for others. For the second era when reelection was rare, we observe a steady decline in growth from between 1% and 2% in the first two years to between zero and slightly negative and 1% in years 3 and 4. For the third era, we continue to observe a positive election year effect. This increase is somewhat less sharp than in Figure 1A, in part due to differences in the measures and comparatively due to the addition of the below-average growth quarters from 2011. Importantly, the rise from roughly 3% growth to slightly below 4% growth occurs midway through the third year, when the primaries are beginning, and it lasts through the second quarter of the fourth year, the last quarter for which voters can observe data prior to the election.

If the increase in years 3 and 4 in the third era truly reflects the effect of increased effort due to the incentive to be reelected, then it should apply for presidents in their first terms, but not in their later terms, when reelection was either banned or unlikely. To evaluate this hypothesis, Figure 2A shows the electoral cycle in GDP growth for presidents in their first terms, and Figure 2B shows the 8-year cycle for presidents who completed exactly two terms.

The results from Figure 2 support the view that the effects shown in Figure 1 are driven by reelection incentives. For first-term presidents in Figure 2A, the decline over the election cycle for the first era is slightly less than 1 percentage point, from 4.5% and 4.4% in years 1 and 2 to 3.7% and 3.5% in years 3 and 4. For the second era, when reelection was rare, we observe a general decline from 3.9% in year 1 to 2.7% in year 4, with a slight increase between years 2 and 3. In the third era, we observe an increase that is somewhat greater than 1%, from 2.6% and 1.5% in years 1 and 2 to 3.6% and 3.2% in years 2 and 3.

The results from Figure 2B indicate that this election cycle is concentrated in the first term. For two-term presidents in the first two eras, as shown by the dashed line, we observe a sharp increase from slightly below 4% growth in the third year to above 6% in year 4, followed by a steady decline to below 2% growth in the last two years of the presidency. For two-term presidents in 1953 and later, as shown by the solid red line, we observe a sharp increase from 2.8% and 0.8% in the first two years to 4.2% and 4.1% in years 1 and 3. Part of this growth reflects selection bias, as the presidents who are most likely to be reelected and to enter into the sample as two-term presidents are those who experienced high growth during election years. Growth is unsteady

FIGURE 2
Real GDP Growth by Year of Presidency for First Terms and for Two-Term Presidents, 1797–2008. A. First Terms and B. Two-Term Presidents



Notes: Real GDP growth is calculated using annual data from MeasuringWorth (2014), as in Figure 1. Only presidents who were initially elected to office and completed at least one full term are included in the data in panel A. Only presidents who completed exactly two full, consecutive terms are included in the data in panel B. Washington is not included because the data begin in the middle of his first term, and Truman is excluded because he was eligible for reelection in 1952. Two-term presidents before 1933 include Jefferson, Madison, Monroe, Jackson, and Wilson. Two-term presidents in 1945 and later include Eisenhower, Reagan, Clinton, and George W. Bush.

but generally declines in the later term, averaging 3.2% in the last four years. While GDP declines slightly after year 4, it remains fairly high, and we do not observe the sort of crash that one would expect if the election year bump was artificial and caused by a monetary or fiscal "trick."

We develop a formal econometric model for these given graphical results. For a given President i in year t, suppose that the growth rate of real GDP is determined by the following model:

$$(1)\quad GDP\ Growth_{it} = \beta_0 + \beta_1 Third\ YR_{it} + \beta_2 Fourth\ YR_{it} + Year_t + Year_t^2 + \epsilon_{it}$$

where $GDP\ Growth_{it}$ is the growth rate of real GDP; $Year_t$ controls for time effects in each year t; $Year_t^2$ is the square of $Year_t$, and ϵ_{it} is a white noise error term. $Third\ YR_{it}$ and $Fourth\ YR_{it}$ are the dummy variables for the third and fourth year of President i's term in office, respectively. The parameters β_1 and β_2 are the coefficients of interest; they measure the full reduced-form effects of the change in the growth rate of GDP in the third and fourth year of President i's term in office.

Columns 1–5 in Table 2 show the results obtained from Equation (1). Columns 6–8 use a variation of Equation (1) with quarterly data. These regressions include control variables for $Year_t$ and $Year_t^2$, plus quarter of the year dummies to control for seasonal effects. Columns 1 and 2 show results for the first era, from 1791 to 1836; columns 2 and 6 display results for the second era, with data ranging from 1837 to 1932 in column 2 and from 1875:Q1 to 1933:Q1 in column 4.[4] Columns 3–5, 7, and 8 show results from the third era, with data ranging from 1933 to 2010 in the annual data and from 1933:Q2 to the 2011:Q3 in the quarterly data. Columns 1, 4, and 7 show data for first-term presidents, and columns 2, 5, and 8 include data for second-term presidents. Because reelection was rare in the second era, results are shown for first- and second-term presidents together. The second terms of Calvin Coolidge and Lyndon Johnson are treated as first terms, because at the end of those terms, both had been in office less than 6 years. The second terms of Franklin Roosevelt and Harry Truman are not included in the data in columns 5 and 8, because both were eligible for reelection. Because of data limitations, the quarterly data from 1948:Q4 and earlier use growth in gross national product (GNP) rather than GDP as the dependent variable; the specification in column 7

4. Franklin Roosevelt's second term was the first for which the inauguration was held on January 20. Previous inaugurations occurred on March 4, so that the previous president remained in office for most of the first quarter of the year after the election.

TABLE 2
Ordinary Least Squares (OLS) Estimates of Effect of Election Cycle on Percentage Points of Real GDP Growth

	(1)	(2)	(3)	(4)	(5)		(6)	(7)	(8)
	1791–1836			1933–2010				1933:Q2–2011:Q3	
Year in Election Cycle	First Term	Second Term	1837–1932	First Term	Second Term	Quarter in Election Cycle	1875:Q1-1933:Q1	First Term	Second Term
Third year	−0.220	−2.603	0.967	0.959	1.647	Third year Q1	−0.135	0.273	1.651
	(1.018)	(1.716)	(1.182)	(1.069)	(1.806)		(0.724)	(1.555)	(3.412)
						Third year Q2	−0.446	−0.364	3.181
							(0.498)	(1.583)	(2.427)
						Third year Q3	−0.369	2.196	−0.956
							(0.815)	(0.954)**	(2.316)
						Third year Q4	−0.035	2.605	1.297
							(1.264)	(1.423)*	(1.404)
Fourth year	−0.147	−2.835	−1.182	2.702	0.005	Fourth year Q1	−0.727	1.719	0.734
	(0.916)	(1.669)	(1.515)	(1.384)*	(0.902)		(1.235)	(1.118)	(4.031)
						Fourth year Q2	−1.897	0.934	0.989
							(0.736)**	(2.206)	(1.609)
						Fourth year Q3	−1.158	0.628	−3.849
							(0.430)**	(0.873)	(1.216)**
						Fourth year Q4	0.306	3.276	−4.521
							(0.623)	(1.445)**	(3.195)
R^2	0.173	0.521	0.112	0.116	0.220		0.124	0.163	0.220
Observations	26	19	96	48	18		171	196	70
Clusters	7	5	22	13	5		12	13	5

Notes: Each column shows results from a different OLS regression in which the dependent variable is real GDP growth. Columns 1–5 use annual data, and columns 6 to 8 use quarterly data of annualized growth rates. The annual regressions control for year and year squared, and the quarterly regressions include those controls plus seasonal dummies for quarters. Due to data limitations, GNP rather that GDP data are used for 1875:Q1–1948:Q4 in the quarterly data; the regression in column 7 includes a control for whether GNP data are used. Standard errors adjust for clustering by president. Of note, the applied standard error correction is valid asymptotically only. Franklin Roosevelt's and Harry Truman's second terms are omitted from the "second term" regressions because both were eligible for reelection. Sources for growth data described in notes to Figure 1.

** and * indicate 5% and 10% significance, respectively.

Additional details in the text.

includes a dummy for whether the GNP data are used.[5] All of the standard errors are adjusted for clustering by president.

The results from Table 2 confirm the general findings from Figures 1 and 2. As column 1 shows, there is no effect of election years on GDP growth for first-term presidents in the first era, when voters did not have access to information about nationwide economic conditions. Column 2 shows large but imprecisely estimated and statistically insignificant negative effects of −2.603 and −2.835 in the third and fourth years in office for second-term presidents in the first era. This negative effect could reflect a decline in investment owing to uncertainty about the identity of the future president, or could reflect a decline in presidential effort near the end of the second term, when departure is imminent.

Column 3 shows a similar and also insignificant negative effect of election years on GDP growth in the second era, when reelection was rare and departure was also imminent. Relative to the effect in the first era, this negative effect appears later—in the fourth year rather than the third—and is less than half the size. In the quarterly regression in column 6, this negative effect arises in seven of eight of the quarters in years 3 and 4, with large and significant effects of −1.897 and −1.158 in the second and third quarters of year 4. Interestingly, this negative effect disappears in quarter four of the fourth year, possibly because the uncertainty about the future has been resolved by the election.

Among first-term presidents in the third era in column 4, we observe a statistically insignificant increase in growth of 0.959 in the third year of the term and a large and marginally significant increase of 2.702 in the fourth year. In column 7, we observe positive effects in the later six of the eight quarters from years 3 and 4. We observe a large, positive, and significant effect of 2.196 in the third quarter of year 3 and a large, positive, and marginally significant effect of 2.605 in the fourth quarter of that year. We observe smaller and statistically insignificant effects of 1.719, 0.934, and 0.628 in the first three quarters of year 4 and a large, positive, and significant effect of 3.276 in quarter four of year 4. This last

5. Quarterly GDP growth data are available beginning in 1947; however, GNP data are used through 1948 so that the variable does not switch for any president mid-term.

positive effect arises after the election and could not reflect the effects of presidential effort. It may arise due to a delayed effect of effort in earlier quarters or the reduced uncertainty associated with investors knowing the identity of the new president.

In results not shown, we examined whether the results in Table 2 were robust to including other covariates in the model such as partisan effects and potentially endogenous fiscal measures. For partisan effects, we created two fractionalization variables that measure the number of seats controlled by the Democratic Party in the House and Senate, respectively. Including the two fractionalization variables in the estimation model, we do not observe significant changes in the sign, magnitude, or statistical significance of the other explanatory variables. Setting aside the concerns for endogeneity, we also examined whether the obtained results are robust to the inclusion of a growth in government outlays variable. We found for the 1933–2010 sub-sample that the inclusion of the growth in government outlays variable was statistically significant at the 1% level (as one might expect a priori). The sign and statistical significance of the fourth-year coefficient in column 4, however, did not change. These robustness checks suggest that the estimated coefficients for the third sub-sample are robust to the inclusion of a variety of other covariates.

We find that some of the estimates are sensitive to the starting dates of the sub-samples. Using the beginning of World War I as the starting point instead of 1933, we observe that the signs of the coefficients in column 4 of Table 2 remain the same, but their magnitudes are smaller than presented in this article. Also, the statistical significance for the fourth-year coefficient in column 4 changes from marginally significant to insignificant. We find similar results when we shift the starting point for the 1933–2010 sub-sample to begin in 1951.

Among second-term presidents not eligible for reelection in the third era in column 5, we observe a large but imprecisely estimated and insignificant increase in growth in year 3 that disappears to zero in year 4. As the quarterly results in column 8 show, the increase in year 3 is concentrated in the first two quarters of that year. In the fourth year in the quarterly data, we observe slight positive and insignificant effects in quarters one and two, a large and significant negative effect of −3.849 in quarter three, and a large and insignificant effect of −4.521 in quarter four. As before, this drop in year 4 may reflect market uncertainty or a decline in presidential effort. The samples of years are similar for columns 5 and 8, and the discrepancy between the quarterly and annual data in year 4—with zero effect in the annual data but a large negative effect in the quarterly data—probably results from differences in the way in which the growth variable is measured.

IV. HETEROGENEITY IN THE EFFECTS OF THE ELECTION CYCLE

A. Main Findings

This section explores how the largest election-year increases and decreases in growth vary across different types of presidents. For presidents from the third era, from 1933 to the present, the difference in growth between the first 3 years of the term and the election year is positive for all of the presidents who survived until reelection except for Jimmy Carter and Dwight Eisenhower. Large effects can be observed for Democrats (including Franklin Roosevelt and Harry Truman) and for Republicans (including Gerald Ford, Richard Nixon, and Ronald Reagan). The returns to effort are probably greatest for high-quality presidents, and growth is larger—and the positive election year effect is larger—for presidents later rated as high quality by historians than for those later rated as low quality. The effect of election years is also largest for presidents whose parties initially controlled both houses of Congress, a result that suggests the returns to presidential effort are greatest when the president's actions are relatively unimpeded. Finally, this election year effect is largest for those presidents who initially commanded high shares of the electoral vote.

The negative effects of reelection years on growth in the first and second eras are somewhat less widespread than is the positive effect in the third era, with drops in the election year for about two-thirds of the presidents. The drops are tremendous for Theodore Roosevelt and Herbert Hoover and are still very large for many; however, large positive effects are observable in a few cases as well. The negative effect of election years is most pronounced for high-quality presidents, for those whose parties initially commanded both houses of Congress, and for those presidents who initially received large shares of the electoral votes. These interactions between election years and presidential quality, divided government, and presidential popularity are the mirror images of the interactions observed in the third era and are consistent with the theory that,

TABLE 3
Percentage Real GDP Growth in Election Years and Non-election Years by President, 1791–2008

	(1)	(2)	(3)	(4)	(5)	(6)
	Percentage Real GDP Growth in …					
	Year Preceding Office	Non-election Year, First Term	Reelection Year, First Term	Second and Later Terms	Reelection Minus Non-election	UK Placebo Test
Bush II	4.14	1.78	3.47	1.83	1.69*	0.60
Clinton	3.39	3.15	3.74	4.44	0.59	−0.31
Bush I	4.11	1.74	3.39		1.66	−0.49
Reagan	−0.27	1.70	7.19	3.73	5.48	0.82
Carter	5.37	4.43	−0.27		−4.71**	−4.34**
Ford	−0.55	−0.21	5.37		5.58	3.21
Nixon	4.84	2.22	5.31	2.62	3.09	1.21**
L. Johnson	4.37	5.15	5.31		0.16	2.86**
Eisenhower	3.83	3.72	1.98	2.69	−1.75	−2.53**
Truman	8.08	−4.32	4.32	4.95	5.34	4.23*
F. Roosevelt	−13.07	6.16	13.05	9.81	1.06	−0.10
Average, 1933–2008	*2.20*	*2.32*	*4.52*	*4.42*	*2.20***	*−0.17*
Hoover	1.15	−3.02	−13.07		−10.05	1.41
Coolidge	13.17	3.28	2.11		−1.17	6.38
Wilson	4.69	−0.33	6.47	1.60	5.40	−3.92
Taft	−10.81	3.85	4.69		0.84	−1.53*
T. Roosevelt	5.31	4.03	−7.18	1.78	−12.38*	0.61
McKinley	−1.65	7.36	2.51	5.31	−4.33	−3.60*
B. Harrison	5.75	4.59	5.10		0.51	−4.19*
Cleveland	1.72	5.25	2.05	−0.19	−0.72	1.87
Arthur	12.50	4.04	−1.65		−5.68	−3.34
Hayes	4.14	6.61	8.29		1.67	8.15*
Grant	3.90	3.49	8.36	3.58	2.82	−3.19*
A. Johnson	1.13	0	3.90		3.90	1.96
Lincoln	1.02	7.30	1.13		−6.16	−0.35
Buchanan	4.02	3.93	1.02		−2.91	0.23
Pierce	11.55	5.27	4.02		−1.25	2.64*
Fillmore	1.39	6.35	11.55		5.20	0.61
Polk	5.68	7.09	3.37		−3.72**	0
Tyler	0.27	3.46	5.68		2.22	5.93
Van Buren	2.96	2.54	0.27		−2.27	−6.06
Average, 1837–1932	*3.57*	*3.95*	*2.45*	*2.42*	*−1.50*	*0.45*
Jackson	1.35	7.09	4.86	3.26	−2.23	
J.Q. Adams	5.93	3.71	1.35		−2.36**	
Monroe	−0.01	2.63	4.96	5.01	2.33	
Madison	0.23	5.91	1.99	2.67	−3.92	
Jefferson	5.69	3.24	2.05	2.58	−1.19	
J. Adams	3.19	4.45	5.69		1.23	
Washington		5.98	5.29	7.67	−0.70	
Average, 1791–1836	*2.73*	*4.72*	*3.74*	*4.24*	*−0.98*	

Notes: This table lists GDP growth for each president who survived until reelection, broken down based upon when the year fell in the presidential election cycle. Reelection year averages growth in reelection years for presidents prior to 1951 (22nd Amendment). Annual GDP data from MeasuringWorth (2014) are used.** and * indicate differences between election years and pre-election years that are significant under the assumption of independent observations with heteroskedasticity. No significance test is possible for Ford, who had only one pre-election year and one election year. In addition to the U.S. results, we also examine whether there is a common growth pattern in the United Kingdom. We employ U.K. growth rates and U.S. President terms for this test in column 6. For real GDP growth in the United Kingdom, data are from the Bank of England and available from 1830 onwards. Additional details in the text.

when the chances of reelection are relatively remote, presidential effort to increase GDP growth declines near the end of the term.

B. Detailed Evidence

Table 3 illustrates how these election year effects vary across presidents. Real GDP growth rates are shown from the annual data for every president who survived to reelection from George Washington to George W. Bush. Column 1 shows growth in the year preceding office, column 2 shows average growth among non-election years in the first term, column 3 shows growth in the reelection year of the first term, and column 4 shows average annual growth in second and

later terms. Column 5 shows the difference in mean growth rates between reelection years and non-election years in the first term. The asterisks indicate whether the difference is significant or marginally significant when each year is treated as an independent observation.

For the third era, the difference in growth between reelection years and non-election years is positive for 9 of the 11 presidents (all except Dwight Eisenhower and Jimmy Carter). None of the positive differences are significant for specific presidents, and one (for George W. Bush) is marginally significant. The negative difference for Carter is large and significant. When averaged across all 11 presidents, the difference comes out to 2.20 percentage points and is statistically significant. When the standard errors are corrected for clustering by president, this effect is marginally significant.

Among the 19 presidents in the second era, growth is lower in reelection years than in other first-term years in 11 cases. One of these differences (for James Polk) is significant, and one (for Theodore Roosevelt) is marginally significant. When averaged across all of the presidents from 1837 to 1932, this difference is −1.50 percentage points and statistically insignificant. Among the seven presidents in the first era, the difference between reelection years and other first-term years is negative in five cases; one of these negative differences (for John Quincy Adams) is significant. The average of these seven differences is insignificant at −0.98 percentage points.

We obtain real GDP growth data from the Bank of England to examine whether presidential effort is a proxy for underlying (and unobserved) factors that are common among similar economies over time. Notably, the United Kingdom does not have the same election cycle as the United States Thus, as a placebo test for the U.S. results, we report data from 1830 to 2008 for the United Kingdom in column 6 of Table 3 (i.e., using the same dates as in column 5 rather than U.K. election dates). For similar periods in the third era, we observe that the United States experienced positive growth in first-term reelection years in contrast to the negative average growth rates in the United Kingdom. In the second era, average growth for the United States during reelection years was lower than non-election years. In comparison, for the United Kingdom, the opposite is true. These results provide further evidence that the prospect of being reelected provides modern-day U.S. presidents incentives to increase GDP growth rates during reelection years.

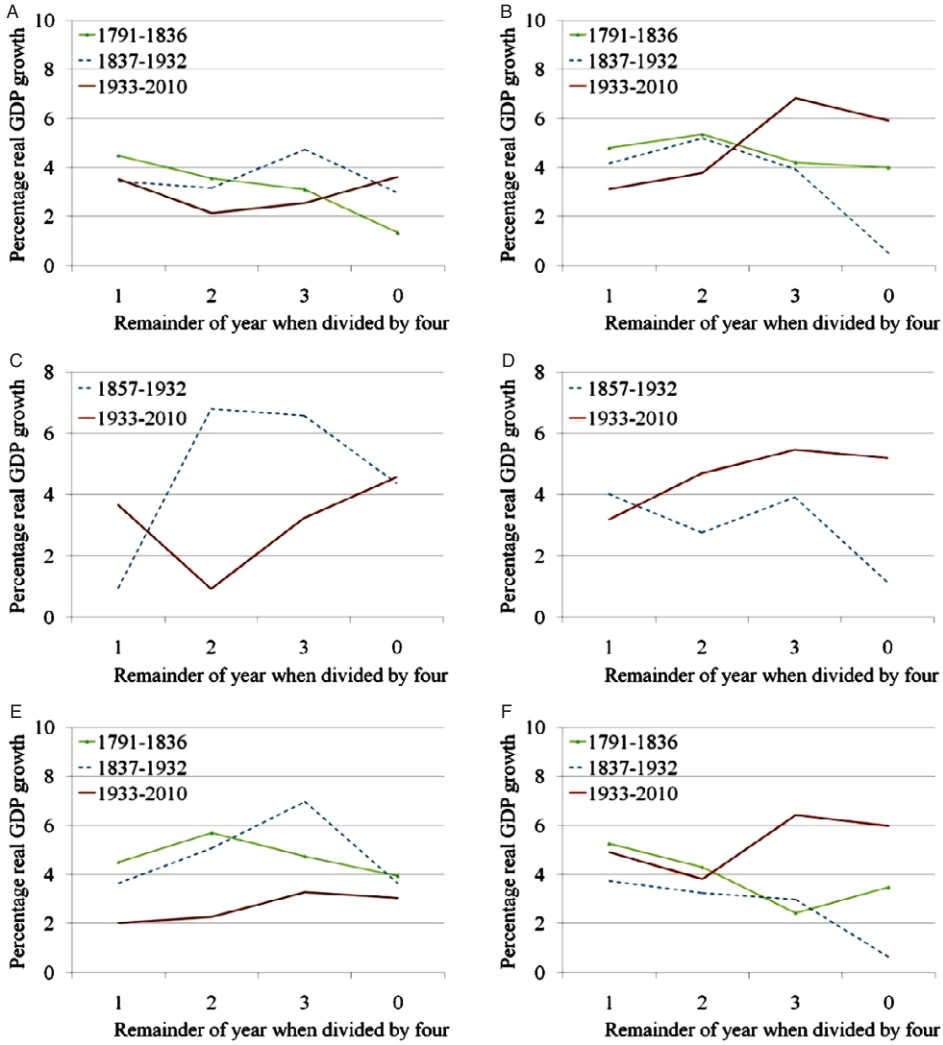
Next, Figure 3 illustrates the degree to which the election year effect varies systematically with characteristics of different presidents. All four panels have the same structure as in Figure 1A, but the graphs are shown for different types of presidents. Panels A and B show the electoral cycle in growth for presidents rated as high and low quality by historians. Panels C and D are restricted to data from 1857 to the present, when the party system had solidified, and they show results for presidents whose parties did not control the House and Senate and those whose parties did control both houses at the start of office. Panels E and F restrict the data to presidents who were initially elected to office (rather than through succession) and show results for presidents whose initial elections commanded high and low fractions of the electoral vote.

The presidential quality index that we use is computed from the rankings of presidential quality as presented in Wikipedia (2011). The rankings are computed by using a weighted average for 17 reputable surveys from presidential historians and other notable scholars on the subject. The results in these surveys reflect historians' views on overall presidential quality and not specifically on their economic competency. Economic policy competence is taken into consideration in these surveys, but it is not the only factor for the overall measure. Other measures such as competency on foreign policy, character, integrity, and so forth are taken into consideration in the rankings as well.

The quality measures in the literature are dominated by rankings of overall performance. Most of the other rankings in the literature, which are not part of the 17 weighted studies in Wikipedia (2011), are highly correlated with the rankings that we use. For instance, rankings across multiple decades such as those from Murray and Blessing (1983), University of Illinois at Chicago (2000), and Faber and Faber (2012) have correlations of 0.97, 0.96, and 0.79 with our ranking, respectively. Some rankings such as those from Faber and Faber (2012) have sub-rankings of various characteristics of presidents. Faber and Faber (2012) present ratings for presidents on foreign relations, domestic programs, administration and intergovernmental relations, leadership and decision making, and personal qualities. These have correlations of 0.40, 0.51, 0.79, 0.78, and 0.76 with our ranking, respectively. Thus, the graphs as shown in Figure 3 might change

FIGURE 3

Growth and the Election Cycle by Type of President and Divided Government. A. Low Quality Index. B. High Quality Index. C. Initially Divided Government. D. Initially Undivided Government. E. Low Initial Popularity. F. High Initial Popularity



Notes: The presidential quality index is computed from the rankings of presidential quality as presented in Wikipedia (2011), which range from 1 to 43. The rankings are computed by using a weighted average for 17 reputable surveys from presidential historians and other notable scholars on the subject. Initial popularity is computed as the ratio of the president's initial electoral votes to those of the second place candidate. For both quality and popularity, the low and high categories are determined by which observations fell above or below the median. Initially undivided government is an indicator for whether the Senate and House of Representatives both had majorities in president's party in the president's first year in office; data taken from U.S. House of Representatives (2011) and U.S. Senate (2011). Presidents who ascended to office due to death of the vice president are excluded from the samples in panels C and D. Electoral vote shares are taken from U.S. Census Bureau (1776) and 270toWin.com (2011). Additional details in the text.

slightly if different types of sub-rankings were used instead of the index.

The general pattern shown in Figure 1A appears in most of the panels of Figure 3; however, the patterns are extreme for some types of presidents, and the curves are relatively flat for others. The patterns shown in Figures 3A and 3B provide suggestive evidence that president

quality is a substantial determinant of economic performance and that it interacts with presidential effort. For low-quality presidents in Figure 3A, GDP growth is mostly between 2% and 4%. We observe a steady decline in growth over the election cycle for the first era, and the patterns are relatively flat for the remaining two eras. For the third era among low-quality presidents, growth is highest in the first year (possibly due to lagged effects of the previous president's policies) and increases steadily over years 2–4. Among high-quality presidents in Figure 3B, growth is generally higher than for low-quality presidents, beginning around 3% to 5% for all three eras. We observe a slightly negative relationship in the first era, a dramatic negative relationship in the second era, with a large drop to almost zero growth in year 4, and a dramatic positive relationship in the third era, with growth rates beginning at 3.1% in the first year (probably low due to lagged effects of the previous president's policies) and 3.8% in the second year and rising sharply to 6.8% and 5.9% in years 3 and 4.

The dashed blue line in Figure 3C shows that, for presidents in the second era whose parties did not control both houses of the legislature, economic performance was highly variable and does not follow a clear pattern—growth is initially low at just below 1% in year 1 of the term, increases sharply to 6.8% and 6.6% in years 2 and 3, and drops off somewhat to 4.4% if year 4. As the solid red line shows, the pattern is also somewhat unclear in the third era. Growth begins at 3.7% in year 1 of the term but drops sharply to 0.9% in year 2, then increases to 3.2% and 4.6% in years 3 and 4. For cases in Figure 3D of presidents that controlled both houses, the pattern is clearer. Growth steadily declines over the term in the earlier era when reelection was uncommon, as shown in the dashed blue line, which starts at 4.0% in the first year and drops to 1.1% by the fourth year. Having control of both houses appears to be particularly important for growth in the third era, when reelection was common. Growth ranged from 0.9% to 4.6%, averaging 3.1% over the 4 years for presidents with divided governments. For presidents with undivided governments in the third era, growth ranged from 3.2% to 5.5%, averaging 4.6% and steadily rising over the 4 years of the term.

As Figure 3E shows, for initially unpopular presidents, we observe a generally flat but slightly negative relationship in the first era. In the second era, we observe a steady and large increase from years 1 to 3 followed by a sharp decline in the fourth year. Finally, we observe a large increase from 2% to slightly over 3% in the third era. For initially popular presidents in Figure 3F, the pattern is more dramatic, with sharp declines for presidents from the first two eras and sharp increases for presidents from the third era.

V. SOURCES AND MECHANISMS OF GROWTH

A. Main Findings

This next section examines the ways in which the election cycle affects growth. Results from sector-specific growth data from 1948 to 2010 indicate that the electoral cycle in growth is spread across multiple industries. For first-term presidents, much of the rise in growth comes from the services and government sectors. Large positive effects can also be seen in the wholesale and retail trade, and finance, insurance, and real estate sectors, and a moderate-sized effect appears for construction. We observe a large negative effect on growth in the manufacturing sector and a moderate-sized negative effect in the mining sector. The negative effects for second-term presidents look much like the mirror image of the positive effects for first-term presidents. The negative effect on growth is concentrated in the wholesale and retail trade sector, with moderate-sized effects in services, finance, insurance, and real estate, and communication. The decline is partially mitigated by an increase in the manufacturing sector.

It is not entirely clear how presidential effort translates into improvements in economic performance. Because the positive effect of election years involves a decline in manufacturing and an increase in services, the growth appears to be associated with the modernization of the economy and may involve day-to-day policies to establish property rights and infrastructure for this modernization. We observe a decline in unemployment in election years, and no clear trends in other macroeconomic variables such as government spending or inflation. One factor that may comove with the election cycle is the real interest rate on federal bonds. Since 1913, interest rates have been affected by policies made by the Federal Reserve System, which is designed to be an independent entity but may be influenced by the president. The real interest rate on federal bonds is lower in years 2 of 3 of the electoral cycle for first-term presidents; this reduction in interest rates in years 2 and 3 may have spurred investment and had a lagged effect on growth in

years 3 and 4 of the electoral cycle. Another pattern for which there is suggestive evidence is a decline in defense-related expenditure in election years for first-term presidents, accompanied by increases in federal spending in the "health" and "other" categories. There is no such change for second-term presidents. This result is consistent with presidents focusing more on the economy and less on national security in election years.

B. Detailed Evidence

Table 4 shows the effects of election years on growth in modern times, separately for different sectors of the economy. Within each panel, each column shows results from a different OLS regression. Columns 1 to 11 show results for different sectors of the economy, and column 12 shows results for all sectors added together. For each sector, the dependent variable is sector-specific GDP in the current year divided by total GDP in the previous year. The regressors of interest are dummies for the third and fourth year in the electoral cycle. The coefficients on these dummy variables can be interpreted as the amount of growth in GDP caused in that sector by the third and fourth years in the electoral cycle. The effects on total GDP growth in column 12 are approximately equal to the sums of the effects from columns 1 to 11. The totals are not exactly equal because the 11 sectors do not include the "rest of the world" and "residual" sectors. Table 4A shows results for first-term presidents, and Table 4B shows results for second-term presidents. All of the regressions control for year and year squared. The sector definitions change in 1981, and each regression also controls for a dummy for 1981 or later.[6]

The results from Table 4 reveal an interesting combination of positive and negative sector-specific effects. For first-term presidents in Table 4A, the total 0.248% increase in GDP in year 3 involves a decline of nearly 1% of GDP in manufacturing and compensating increases in GDP attributable to the government, services, and finance, insurance, and real estate sectors. We also observe a moderate decline in mining and a moderate increase in construction in the third year. In the fourth year among first-term presidents, we observe a slightly smaller decline of −0.527% of GDP in manufacturing and larger

6. Sector-specific GDP data are available for both definitions of sectors for multiple years; 1981 is selected as the cutoff year so that these sector definitions do not change for any president mid-term.

TABLE 4

OLS Estimates of Effects of Election Cycle on Contribution to Real GDP Growth by Sector, 1948–2010

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
					Panel A: First Term Presidents (41 Years, 12 Presidents)							
	Agriculture	**Mining**	**Construction**	**Manufacturing**	**Transportation**	**Communication**	**Utilities**	**Wholesale & Retail Trade**	**Finance, Insurance, & Real Estate**	**Services**	**Government**	**Total**
Third year	−0.046	−0.175	0.156	−0.863	−0.032	−0.020	−0.038	0.061	0.261 (0.253)	0.408	0.507 (0.493)	0.248
	(0.075)	(0.117)	(0.233)	(0.864)	(0.096)	(0.081)	(0.075)	(0.210)		(0.309)		(1.072)
Fourth year	0.028	−0.132	0.168	−0.527	0.089	0.075	−0.041	0.341	0.305 (0.268)	0.643	0.461 (0.516)	1.299
	(0.059)	(0.136)	(0.231)	(0.578)	(0.102)	(0.073)	(0.094)	(0.220)		(0.352)*		(1.078)
R^2	0.990	0.656	0.155	0.946	0.941	0.971	0.691	0.953	0.974	0.984	0.637	0.167
					Panel B: Second Term Presidents (22 Years, 6 Presidents)							
Third year	−0.015	−0.001	0.167	1.140	0.065	0.067	0.116	−0.004	0.040 (0.228)	0.080	0.087 (0.330)	1.699
	(0.153)	(0.154)	(0.119)	(0.722)	(0.091)	(0.103)	(0.063)	(0.359)		(0.209)		(1.388)
Fourth year	−0.032	0.062	−0.036	0.584	−0.080	−0.117	0.076	−0.444	−0.167 (0.296)	−0.175	0.012 (0.385)	−0.313
	(0.168)	(0.164)	(0.194)	(0.401)	(0.026)**	(0.046)**	(0.089)	(0.364)		(0.358)		(0.857)
R^2	0.992	0.795	0.299	0.979	0.972	0.994	0.786	0.932	0.990	0.993	0.697	0.207

Notes: Within each panel, each of columns 1–11 in this table presents results from a separate OLS regression in which the dependent variable is real sector-specific GDP divided by the previous year's total GDP. The regressor of interests in each case are dummy for whether the remainder of year when divided by four is three or zero. The coefficients in columns 1–11 add up to roughly the coefficient in column 12, which measures the effect of an election year on overall real GDP growth. All 12 regressions control for year, year squared, and a dummy for 1981 or later, when the sector definitions changed. Standard errors are adjusted for clustering by president. Sector-specific growth rates taken from U.S. Census Bureau (2014) and U.S. White House (2011a). Additional details in the text.

increases of 0.643% of GDP in services, 0.461% in government, 0.341% in trade, and 0.305% in finance, insurance, and real estate, adding to a total increase of 1.299% of GDP in the fourth year. We also observe a moderate-sized decline in mining and a moderate-sized increase in construction in the fourth year. Notably, we find high R^2s above 0.90 in columns 1, 4, 5, 6, 8, 9, and 10. This suggests that a large portion of the variation in the GDP growth rates in these sectors is explained by including dummy variables for the third and fourth year of President *i*'s term in office and control variables including year, year squared, and a dummy for 1981 or later in the regressions.

Among second-term presidents in Table 4B, we observe a large 1.699% increase in GDP in year 3, two-thirds of which is attributable to an increase in production in manufacturing. We continue to observe a large positive effect of 0.584% on GDP due to manufacturing in the fourth year, but these effects are counterbalanced by a large decline in growth of trade and moderate declines in growth of finance, insurance, and real estate, services, and communications, leading to an overall negative effect of the fourth year on GDP growth of −0.313%. Similar to the high R^2s found in Table 4A, we find values above 0.90 in columns 1, 4, 5, 6, 8, 9, and 10 in Table 4B.

To better understand the mechanisms behind the electoral cycle in growth, Figure 4 plots a variety of macroeconomic indicators against mod(year,4). Figures 4A and 4B show the rates of growth in real government spending and revenue for the three eras. Figure 4E shows the real growth rates in three other key components of GDP—private domestic investment, consumption, and consumption of durables—for the 1933–2010 era. Figure 4F shows monthly unemployment rates for January, 1948 through October, 2011, presented separately for first-term and second-term presidents. Figure 4D shows inflation for the three eras, measured based upon the GDP deflator. Figure 4C shows the real interest rates on federal bonds for 1800 to 1899 (excluding 1833–1841, for which no data are available) and 1934–2011. The earlier data show the average interest rate on "selected federal bonds" by Homer and Sylla (2005), and the later data show the return on 3-month treasury bills on the secondary market.

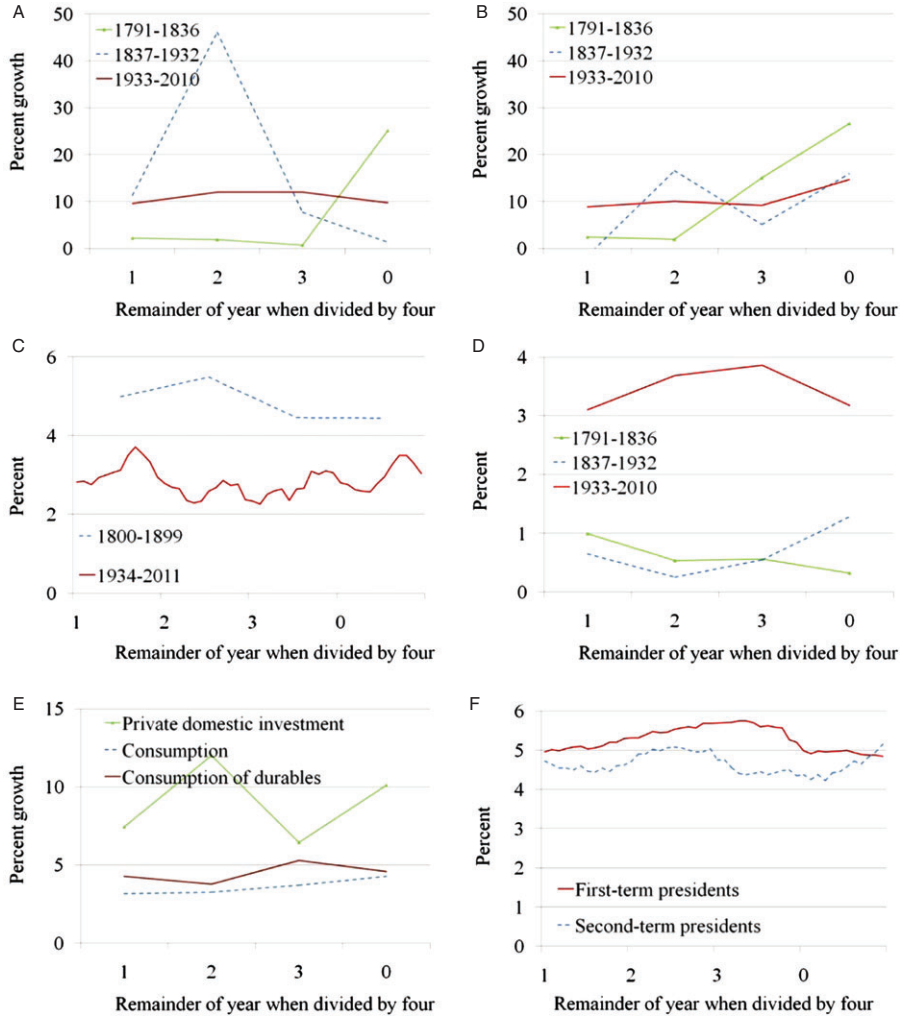
As Figure 4A shows, the electoral cycle in government spending growth varies substantially by era. In the first era, shown by the green line, growth in spending was small for the first 3 years of a term and increased substantially in the election year. In the second era, shown by the dashed blue line, growth in spending was higher generally and was greater than 40% in the second year of the term for reasons that are not clear. Unlike these earlier eras, the red line indicates that there is no apparent electoral cycle to spending growth in modern times, and the curve is flat across the 4 years of the election cycle. Government receipts grow fairly steadily over the election cycle for the era from 1791 to 1836, and they exhibit a rocky increase over the cycle for 1837–1932. The reason for these rises is unclear, as they rise at the same time that GDP growth was declining. In modern times, as shown by the red line, growth in government revenue is flat in the third year despite the rise in income growth, a result that suggests a slight reduction in tax rates in the third year of the electoral cycle.

Figure 4C provides some very suggestive evidence of electoral cycles in interest rates; however, it is not clear from these data whether the patterns reflect causal relationships or simply sampling variation. For the period 1800–1899, real interest rates on federal bonds were 0.5–1 percentage point lower in years 3 and 4 than in earlier years—an effect that may reflect an attempt to stimulate investment in years close to the reelection. For the modern period from 1934 to 2011, real interest rates are 3.5% to 3.7% in August to October of the second year and decline sharply to 2.3% in April to June of the third year. The rate hovers between 2.3% and 2.6% through July of the third year and then increases, ranging from 2.6% to 3.5% through the fourth year. The decline in real interest rates in years 2 and 3 could reflect strategic behavior, if the government wished to stimulate investment, which it believed had a lagged effect on growth.

As with government spending, the relationship between inflation and the electoral cycle varies by era, as shown in Figure 4D. In the first era, inflation declines steady from the first to the fourth year in office. In the second era, we observe three relatively low rates of inflation and a sharp increase in the fourth year. In the modern era, we observe an inverse u-shape, with slightly higher rates of inflation just below 4% in years 2 and 3 of the presidential term, relative to rates just above 3% in years 1 and 4. This rise in inflation in years 2 and 3 mirrors the decline in the real interest rate over the same period, but this pattern does not appear to match with a clear election-based strategy, unless it involves a strategy for reducing real interest rates in years 2 and 3.

FIGURE 4

Other Macroeconomic Variables and the Presidential Election Cycle. A. Government Spending. B. Government Receipts. C. Interest Rates on Federal Bonds. D. Inflation. E. Investment, Consumption, and Consumption of Durables, 1933–2010. F. Unemployment, 1948–2011



Notes: Government spending and receipts data taken from U.S. Census Bureau (2014). Consumption, durables consumption, and gross domestic private investment taken from U.S. Census Bureau (2014) and U.S. White House (2011a). Inflation for earlier years taken from GDP deflator on MeasuringWorth (2014). Later interest rate on treasury bonds and inflation in later years measured using monthly consumer price index from U.S. Federal Reserve Bank of St. Louis (2011). Unemployment rate taken from U.S. Bureau of Labor Statistics (2011). Interest rate in earlier years is missing 1833 to 1841 and is taken from Homer and Sylla (2005).

For the other components of GDP in the third era, as shown in Figure 4E, we observe that real growth in private investment spikes in year 2, when the real interest rate is lowered. In 2010, private domestic investment is roughly 12% of GDP, and 12% growth in investment would contribute 1.5 percentage points of growth in GDP. Investment growth also rises in year 4 for reasons that are not entirely clear. Consumption naturally increases with income, and as GDP growth rises over the election cycle, both total consumption and consumption of durables rise as well.

The monthly data from 1948 to 2011 on unemployment in Figure 4F do appear to show an election cycle. For first-term presidents, we observe a steady rise in the unemployment rate over the

TABLE 5
OLS Estimates of Effects of Election Cycle on Tax Rates, Inflation, and Growth in Government Expenditures by Function

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Panel A: First Term Presidents							
				Percentage Growth in Real Federal Spending on …				
	Maximum Marginal Income Tax Rate	**Maximum Corporate Tax Rate**	**Inflation**	**Defense**	**Health**	**Income security**	**Social Security**	**Other**
Third year	−0.289	−1.710	0.755	−6.437	6.283	4.450	0.559	10.96
	(1.039)	(0.966)	(0.784)	(5.994)	(10.26)	(5.153)	(1.247)	(9.433)
Fourth year	−0.681	−1.377	0.209	−1.520	2.394	−4.531	−1.861	1.127
	(2.319)	(1.404)	(0.672)	(2.910)	(4.126)	(6.753)	(1.542)	(3.383)
R^2	0.750	0.729	0.110	0.397	0.129	0.038	0.651	0.119
Years	49	48	44	44	44	44	44	44
Presidents	13	13	12	12	12	12	12	12
	Panel B: Second Term Presidents							
Third year	−2.891	−1.222	−1.170	−1.039	1.059	−4.890	−2.117	−4.062
	(3.761)	(1.365)	(0.836)	(1.472)	(1.819)	(4.170)	(1.484)	(10.91)
Fourth year	−4.630	−2.356	−0.943	−0.140	−2.117	−5.122	−1.204	−2.109
	(6.685)	(3.008)	(0.937)	(3.337)	(1.474)	(11.52)	(1.200)	(1.666)
R^2	0.953	0.902	0.213	0.169	0.700	0.210	0.870	0.080
Years	18	18	18	18	18	18	18	18
Presidents	5	5	5	5	5	5	5	5

Notes: Table is structured in the same way as Table 4. Tax rates are taken from Tax Policy Center (2011a, 2011b). Inflation is taken from the GDP deflator in MeasuringWorth (2014). Federal spending by category is taken from U.S. White House (2011b). Each regression controls for year and year squared, and standard errors adjust for clustering by president.

first 3 years, followed by a sharp drop from 5.6% near the end of the third year to 5.0% at the start of the fourth year; the rate declines further to 4.8% by the end of the fourth year. This drop is slightly less pronounced but still appears when 2009–2011, 3 years with particularly high unemployment, are dropped from the sample. For second-term presidents, we observe some evidence of an election cycle, but it is less pronounced, with a temporary increase in unemployment from 4.5% to 5.1% in the second year in office and a steady rise in the later part of the fourth year, from 4.4% in April to 5.2% in December.

The final set of evidence comes from Table 5, which explores specific policies in greater detail for the period from 1933 and later. The structure of Table 5 is the same as for Table 4, with separate panels for first- and second-term presidents. The outcome variables include maximum marginal income tax and corporate tax rates in columns 1 and 2, inflation in column 3, and growth in real government expenditure, broken down by major function: defense in column 4, health (including Medicare) in column 5, income security programs in column 6, Social Security in column 7, and all other federal expenditures in column 8.

The results from Table 5 help to clarify some of the findings from Figure 4. Figure 4B showed a slight increase in tax revenue in year 4 in the later period, presumably attributable to rising income in election years. In column 1 of Table 5A, we obtain the imprecise results that, relative to the first 2 years of the term, income tax rates are 0.289 and 681 percentage points lower in years 3 and 4 for first-term presidents. The effect is larger for corporate taxes, with declines of 1.710 and 1.377 percentage points in years 3 and 4. It is unlikely that this pattern is driving the electoral cycle in growth, however, as larger drops in taxes are observable among second-term presidents (for whom growth decreases in election years) in Table 5B. In column 3, we observe a slight increase of 0.662 percentage points in inflation in year 3 of first-term presidents' terms and slight decreases in inflation in years 3 and 4 of second-term presidents' terms. The slight increase for first-term presidents does not continue into the fourth year, however, and the relationship does not appear to be sufficiently strong to support the contention by Nordhaus (1975) that the rise in real growth is driven by inflation. We observe declines in inflation of −1.170 and −0.943 in years 3 and 4 for second-term presidents.

One notable, although statistically insignificant, change in fiscal policy that can be seen in columns 4 to 8 is that growth in defense spending declines for first-term presidents, with growth 6.437 and 1.520 percentage points lower in years 3 and 4 than in earlier years. Corresponding increases of +6.283 and +2.394 percentage points can be seen in health-related expenditures, and we observe a large 10.96 percentage point increase in expenditures in the "other" category during the fourth year. This pattern does not appear for second-term presidents, for whom we see moderate-sized declines in election years in growth in the income security and "other" categories.

VI. CONCLUSION

This study presents new evidence that the president plays a substantial role in influencing GDP growth. Sitting presidents in their first terms face strong incentives to increase growth in election years; presidents in later terms face no such incentive. To the extent that the president's effort influences economic activity, we should observe increases in growth in election years for first-term presidents but not for second-term presidents. Using data from 1933 to the present, we find that growth increases by 1.0 to 2.7 percentage points in the third and fourth years of first-term president's terms. There is no such pattern for second-term presidents or for presidents in earlier eras, when reelection was rare. Many of the specifications show a decline in GDP growth at the end of second-term presidents' terms, an effect that is consistent with a decline in presidential effort as departure becomes imminent. The positive effect of reelection years on GDP is concentrated among high-quality presidents, for whom the returns to effort are probably largest. The effect is spread across multiple sectors of the economy and coincides with a drop in unemployment and a slight shift in federal spending away from national defense and toward other sectors.

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