An Economic Ranking of the US Presidents, 1789-2009:
A Data Based Approach

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By
Mark Zachary Taylor
Assistant Professor
Sam Nunn School of International Affairs
Georgia Institute of Technology
781 Marietta St NW
Atlanta, GA 30332-0610
(FedEx/UPS Zip Code is 30318)
Phone: (404) 385-0600
Fax: (404) 894-1900
contact: mzak@gatech.edu
website: http://www.mzak.net
twitter: @mzak123

ABSTRACT (239 words)
Using new data from the MeasuringWorth Project, this article presents economic rankings of the United States presidents who served from 1789 until 2009. It analyzes up to two-hundred twenty years of data on economic growth, unemployment, inflation, government debt, balance of payments, income inequality, currency strength, interest rates, and stock market returns to estimate an economic grade point average for each president. This estimate is then used to test for correlations with other variables in order to generate hypotheses regarding the conditions for superior and inferior economic performance. The correlations suggest that above average economic performance is enjoyed by presidents who: belong to pro-business political parties, work with a Congress in which only one house is dominated by the same party as the President, serve during wartime, or were raised in middle-class environments. Interestingly, Presidential intelligence and open-mindedness may count only at the extremes: the top ten most "intellectually brilliant" or mentally "open" presidents scored on average a substantially higher economic GPA than the bottom ten, but there was no significant correlation overall. Conversely, presidents with below average economic performance often belonged to parties which are relatively pro-farmer, pro-labor, or pro-consumer; entered a homogenous Federal government in which one Congressional house flipped parties; or were raised in relatively lower-class environments. Finally, some low correlations were also of interest. There were no substantive correlations between Presidential economic performance and pre-political career, birth order, historical "greatness", or darkhorse vs. well-vetted presidents.

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How relatively good or bad were the economic performances of our past presidents? The answers to this question remain unclear. Most evaluations of presidential performance cloud the issue with partisan bias, subjective judgments, or mix economics together with other policy areas. To address these shortcomings, this article uses new data from the MeasuringWorth Project to calculate the relative economic rankings of the United States presidents who served from 1789 until 2009. It analyzes up to two-hundred twenty years of data on economic growth, unemployment, inflation, government debt, balance of payments, income inequality, currency strength, interest rates, and stock market returns to estimate an economic grade point average for each president. These estimates are then used to test for correlations with other variables in order to generate hypotheses regarding the conditions for superior and inferior economic performance.

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How relatively good or bad were the economic performances of our past presidents? The answers to this question remain unclear. Most evaluations of presidential performance cloud the issue with partisan bias, subjective judgments, or mix economics together with other policy areas. To address these shortcomings, this article uses new data from the MeasuringWorth Project to estimate relative economic performance scores of the United States presidents who served from 1789 until 2009. These estimates are then used to test for correlations with other variables in order to generate hypotheses regarding the conditions for superior and inferior economic performance.

1. Introduction

"It's the economy, stupid!" is now a standard trope used to explain the outcomes of US presidential elections and favorability surveys. Originally proclaimed by the 1992 Clinton campaign headquarters to explain his surprise victory over George H.W. Bush, twenty years later analysts and campaign managers are now making similar arguments about the course of the 2012 presidential election. With poll after poll also ranking the economy as a top priority for voters, politicians and pundits on both sides of the aisle are eager to seize the mantles of Presidential economic success stories, like Reagan or Clinton, while attacking their opponents as being reminiscent of perceived failures such as George W. Bush, Woodrow Wilson, Herbert Hoover, or even one of the Roosevelt's.

But how relatively good or bad were the economic performances of our past presidents? The answers to this question remain unclear. Most presidential ranking systems cloud the issue with partisan bias, subjective judgments, or mix economics together with other aspects of presidential performance (Eland, 2009). Meanwhile, think tanks use presidential rankings to advance their policy agendas, while academic surveys of rank allow scholars to collectively muse over the grand sweep of history rather than produce rigorous, scientific evaluations of performance (Eland 2009; Vedder and Gallaway, 2001). As a result, there is currently no purely economic ranking which covers all of the US Presidents based on objective, statistical data.[1] If economic performance matters so much for elections, then scholars should attempt to more scientifically evaluate it and to ascribe responsibility where the empirical evidence is most compelling.

As a step towards resolving the economic performance puzzle, this article gathers together new data from the MeasuringWorth Project at the University of Illinois at Chicago, along with traditional government datasets on the economy.[2] It analyzes up to two-hundred twenty years of indicators of those aspects of economic performance which Americans find most important. These data were used to estimate an economic "grade point average" (GPA) of the US presidents who served from 1789 until 2009.[3] Cognizant of the "uses and abuses" of Presidential rankings, this article lets the economic data speak for themselves. No historical or ethical judgments were used to adjust the findings, nor was there any attempt to advance any particular political, economic, or theoretical agenda here. To further increase robustness, economic performance was triangulated on by using multiple and competing statistical measures, ranking algorithms, and time lags. In this way, much random error and latent subjective biases should cancel out, allowing systematic performance to show through.

These estimates of presidential economic performance are then used to test for correlations with other variables in order to generate hypotheses regarding the conditions for superior/inferior economic performance. The correlations suggest that above average economic performance is enjoyed by presidents who: belong to pro-business political parties, work with a Congress in which only one house is dominated by the same party as the President, serve during wartime, or were raised in middle-class environments. Interestingly, Presidential intelligence and open-mindedness may count only at the extremes: the top ten most "intellectually brilliant" or mentally "open" presidents scored on average a substantially higher economic GPA than the bottom ten, but there was no significant correlation overall. Conversely, presidents with below average economic performance often belonged to parties which are relatively pro-farmer, pro-labor, or pro-consumer; entered a homogenous Federal government in which one Congressional house flipped parties; or were raised in relatively lower-class environments. Finally, some low correlations were also of interest. There were no substantive correlations between Presidential economic performance and pre-political career (lawyers, military men, and farmers all averaged roughly the same), birth order, historical greatness (as judged by surveys of scholars), or darkhorse vs. well-vetted presidents.

2. Do Presidents Have Much Infuence on the Economy?

At first glance, it might seem that Presidents have only a minor role in determining the country's economic prosperity. After all, the United States has one of the world's most free-market economic systems, which tends to minimize the role of government. Also, Congress, not the President, controls the budget and holds primary jurisdiction over legislation. Nevertheless, every president since Washington has had

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[1] The only non-partisan, scholarly, data-based, purely economic rankings which have been published are limited to the eleven post-World War II presidents (Dolan, Frendreis, and Tatalovich. 2009).

[2] Lawrence H. Officer and Samuel H. Williamson, http://www.measuringworth.com/

[3] With the exception of William Henry Harrison and James Garfield who were omitted due to the abortive nature of their administrations.

Congressional allies with whom he has worked to affect economic policy. Certainly, the Federal government as a whole has a variety of levers by which policymakers can affect the economy. Over time, these policy levers have included taxes, trade policy, land grants and sales, service contracts, procurement programs, regulations, loans, subsidies, anti-trust regimes, intellectual property, and even military action. The President has direct control over a subset of these policies. Also, the executive branch can act as a focal point or source of policy, especially when Congress is fractured, gridlocked, or disorganized. And if "animal spirits" play a causal role in national economic performance, as is argued by economists, then the President at his bully pulpit is in a prime position to affect those spirits (Akerlof and Shiller, 2009; Wood, Owens, and Brandy, 2005). Indeed, the President's effect on the economy can sometimes be quite powerful. For example, Gauti Eggerstson at the New York Federal Reserve has identified Franklin D. Roosevelt's mere inauguration as the turning point of the Great Depression; certainly FDR's subsequent policy agenda was transformational (Eggertsson, 2008; Brands, 2008). Therefore, although the executive branch may appear to have a limited role on paper, the historical record suggests that presidents can affect the economy in large ways. Certainly voters seem to think so. Economic issues have been central to almost every Presidential election and appear to affect both voter turnout and choice (Lewis-Beck and Stegmaier, 2000; Nadeau and Lewis-Beck, 2001; Geys, 2006; Lewis-Beck, Nadeau, and Elias, 2008; Vavreck, 2009; Evans and Pickup, 2010; Singer, 2011). While most scholarly research has focused on this relationship during post-World War II elections, evidence for it has also been found across the history of American elections (Lynch, 2002).

If Presidents can affect the economy and are judged by voters, historians, and the media by economic outcomes during, or soon after, their administration, then it makes sense to develop more objective ratings of presidential economic performance.

3. Which Data Was Used and Why

Which data should be used to judge presidential economic performance? There is simply no objective answer to this question. Even experts disagree on precisely which indicators to include and how to weight them. Research has further shown that perceptions of performance and responsibility can be affected by partisanship (Tilley and Hobolt, 2011; Uscinski and Simon, 2011). This applies not only to scope conditions, but also which data to include, weights to assign, and algorithms to use. This problem is exacerbated by the fact that, clearly, initial choices about data and weights will affect the results. For example, in one ranking exercise, the libertarian Von Mises Institute uses only government spending as a percent of total output (Vedder and Gallaway, 2001). Naturally, wartime big-spenders (e.g. Lincoln, Wilson, and FDR) rank near the bottom of that list, while their successors, all peacetime budget-slashers, came in on top (e.g. A. Johnson, Harding, and Truman). Conversely, we can assume that a left-leaning judge might instead select measures such as income inequality, welfare spending, or poverty levels, and wind up placing some of those same big-spender presidents amongst the top ranks.

To minimize this kind of partisan or ideological subjectivity, this article's solution is to select those indicators most often mentioned by mainstream Western economists, the media, and voters when judging US economic performance. After all, it makes sense to judge American presidents using mainstream American economic values. This does not eliminate subjectivity, but it should at least take personal political biases out of the equation. It also attempts to match the ranking criteria with popular preferences. That is, it attempts to put the American public at the judge's table, rather than some supposedly "objective" expert or group thereof.

First, mainstream economists, policymakers, and observers generally applaud an economy which simultaneously achieves four goals:

- increases national wealth
- reduces unemployment
- minimizes inflation
- reduces the balance of payments burden

This combination of indicators is therefore used here as the base measure of economic performance. In order to construct the rankings, four more indicators are added: reduction in economic inequality, currency strength, interest rate changes, and stock market performance. These additional indicators are included because: 1) they are also generally viewed as broad measures of macroeconomic performance, 2) reliable data exist over long

periods of time, and 3) they do not correlate highly with each other or with the base indicators; therefore they likely capture different aspects of economic performance. Data with these characteristics are rare. Also, critics might argue that the four base measures are insufficient data upon which to base Presidential rankings. These secondary measures therefore bring valuable scope and depth to the calculation. The description of these data and summary statistics are abstracted below in Table 1. Complete explanations of the data sources, coding rules, and selection criteria are available in the Appendices.

While every effort has been made to minimize error and subjective judgments in the economic rankings reported above, there are two inherent biases worth pointing out. First, the choices of measures and weightings do contain assumptions in favor of mainstream neo-classical, perhaps neo-Keynesian, economics as is taught in most American universities (Mankiw, 2011). Therefore, even though measures of unemployment and income inequality are included in the above rankings, the overall weightings will tend to favor the achievement of wealth and efficiency over economic equity or social justice. While it makes sense to judge American executives using mainstream American economic values, this does not make these values objectively correct. Second, all economic data suffers from statistical errors and heteroskedasticity issues which increase as these time series recede backward in time. This ranking exercise is no different. Even with modern data gathering apparatus, most of the economic indicators used above are difficult to calculate; indeed, historical estimates are even more fraught with statistical error.

This study attempts to address these weaknesses in three ways. First, the rating system used here communicates in an accurate and familiar way the "signal" contained in the economic data, while simultaneously being explicit about the "noise" and subjective judgments involved in this type of exercise. It also attempts to correct for noise and bias by using triangulation, four-year periods, multiple time lags, and competing ranking algorithms. That is, the economic data, while containing error bars, does communicate objective information about economic performance which this study attempts to isolate. Second, the aggregation of data into four-year periods should help to eliminate some of the problems involved in making point estimates for individual years, as well as average out some of the random error. In those cases where change over time is measured then, as long as the error is similar across each year (either random or systematic), it will tend to be subtracted out. Finally, all data are available for other scholars, using their own scoring rules, weights, and additional input measures (e.g. leadership, progress in science and technology, wealth redistribution) to construct their own rankings for comparison.

Table 1: Data Description

Measure*	Unit	Source**	Max	Mean	Min	SD
Base Measures						
Internal Balance:						
Change in real per capita GDP, (1790)	Percentage	Johnston and Williamson (2011)	34.1%	5.6%	-21.4%	9.0%
Change in inflation rate (1789)	Percentage	Officer and Williamson (2011)	62.0%	5.0%	-24.2%	14.1%
Change in unemployment rate (1890)	Percentage points	1890-1947 data from US Dept of Commerce; 1948-2010 data from US Dept of Labor.	16.2	0.01	-9.1	5.0
External Balance:			**Max**	**Mean**	**Min**	**SD**
Average trade balance as % of GDP (1790)	Percentage	US Dept of Commerce	0.47%	-0.2%	-4.2%	0.87%
Average budget surplus as % of GDP (1790)	Percentage	1790-1970 data from Dept of Commerce; 1901-2010 data from Office of Mgmt and Budget.	1.27%	-0.4%	-4.4%	0.98%

Secondary Measures						
Change in Share of Aggregate Income Received by Top 5% (1913)	Percentage points	1913-1948 data from Lindert (2000); 1949-2010 data from U.S. Dept of Commerce	32.1%	19.4%	8.4%	6.11%
Percentage change in Dow Jones Industrial Average (1885)	Percentage	Williamson (2011)	110.6%	25.0%	-59.7%	38.2%
Change in interest rates (1798)	Percentage points	Officer (2011)	5.44	-0.02	-2.42	1.17
Percentage change in $US price of UK pound (1791)	Percentage	Officer (2011)	38.3%	-1.41%	-25.7%	9.5%

*First year of time series indicated in parentheses. **See Appendix I for full citations.

4. How The Grades Were Calculated

Grades were assigned in manner similar to that of a professor evaluating his/her students. Each student (presidential administration) is given eight assignments (the eight indicators of national wealth, inflation, employment, etc.). Performance on these assignments is graded individually using a traditional A-F (0-4 point) grading scale that is curved (see below). Then those grades are averaged into an overall GPA and class ranking. In calculating the grades and GPAs, each of the economic indicators was weighted equally and graded in an intuitive manner. The use of grades and GPAs is not intended to be cavalier, flippant, or cute. They are advantageous in several ways. First, grades constitute a ranking system that is accessible and familiar to the vast majority of readers. Second, grades most explicitly and honestly reflect the strengths and weaknesses of a rating exercise such as this. As teachers, parents, and former students, most readers will recognize that, like grades received in school, the grades reported here are an approximation. But while grades are never perfect measures, they are often good indicators of performance.

To provide a pragmatic and credible ranking of the presidents, several techniques were used to drive down random error and systematic bias. For example, since there is no consensus as to precisely when a new president become responsible for the economy, the GPAs were calculated separately for honeymoons of zero, one, and two years. Also, two competing grade curves were used. The first algorithm used strict quintiles: the top 20 percent of performers received an "A" (4 points), the second 20 percent received a "B" (3 points), and so forth. The second algorithm imposed a bell-curve. Specifically a "C" (2 points) was awarded to all scores within one standard deviation of the mean, centered on the mean. For the next half standard deviation, a "B" or "D" was awarded as appropriate; for the remaining administrations, an "A" or "F" was awarded accordingly. This method rewards/punishes extremes in performance, hopefully better identifying truly great or poor executives, while expanding the number of administrations considered to be merely average. After the individual indicators were graded, they were combined via a simple average into an overall grade for each administration or President.

The final GPA calculation brought together all of the above grades to produce Tables 2 and 3. For each President, each final "strict quintile" and "bell-curve" GPA for each honeymoon was averaged together and a final GPA assigned. Thus, in order to earn a 3.00 or higher, a president or administration had to consistently score well, regardless of honeymoon period or grading algorithm (e.g. FDR consistently got A's througout each different scoring approach). Likewise, in order to earn a GPA below 1.00, a president or administration had to consistently and robustly perform poorly.

A complete explanation of the grading methodology, as well as resolutions of technical issues are available in the Appendices. There readers can find technical discussions of issues such as periodization, multicollinearity, cross-algorithm consistency, and data commensurability. Let it suffice to say here that each of these issues was addressed with the goal of minimizing bias and error. Perhaps more importantly, all data used in these rankings are publically available for those readers who prefer to replicate or critique my methods, or to calculate alternative rankings using their own scoring rules, weights, or additional input data. Interested scholars

might further address particular presidents which they find to be controversial using historical research or more in-depth statistical methods.

5. Economic GPAs and Rankings, 1789-2009

Tables 2 and 3 below report the results of this novel rating system of Presidential economic performance based solely on quantitative data and generated by the methods described in the Appendices. The first set of ratings awards each President an economic grade point average and relative ranking (Table 2). The second set awards each separate administration a grade point average and relative ranking (Table 3). Even a casual examination of the tables reveals some surprises, such as the high rankings of some traditionally poorly-regarded presidents (e.g. Harding, Hayes, and Fillmore) or the relatively low rankings of some national heroes (e.g. Lincoln, Madison, Monroe, J.Q. Adams, and Jackson). These apparent paradoxes will be resolved in subsequent sections. Analysis of the grades and their correlations with other measures (party, veto-players, partisanship, president background) are also discussed below.

It is tempting to dismiss these rankings as the product of dumb luck: getting elected at the top or bottom of the business cycle. Randomness surely plays some role in these rankings but, as argued above, presidents also bear responsibility for making their own luck. For example, Van Buren and Hoover did not receive the lowest grades merely by accident of the major economic depressions which struck during their presidencies. For decades before the Panics of 1837 and 1839 struck, Martin Van Buren and his Democratic party eviscerated the very institutions which could have ameliorated the Depression of 1839-1843 which ruined his presidency. Nearly a century later, Republican Herbert Hoover took relatively minor actions in response to the Great Depression, adhering instead to the classical economic beliefs of his time that markets would self-correct, and that the federal government had no business providing aid or welfare to individuals. Meanwhile neither Hayes nor FDR simply "lucked out" by entering into office near the bottom of a depression. Hayes was an intelligent, adroit administrator who played physician to the plague of scandals and ineptitudes afflicting the long Grant administration which preceded his. Hayes actively attacked corruption, reduced the national debt, restored public credit, and forcefully addressed the new phenomenon of militant labor strikes. Decades later, FDR set unique precedents for government intervention into the economy in his attempts to end the Great Depression. Clearly more historical analysis is needed to better resolve the responsibility of each president for his economic performance. But, generally speaking, this article contends that presidents are neither helpless victims nor lucky lottery winners, hence their economic GPAs should not be dismissed as random draws.

Table 2: Economic Grades and Rankings of the Presidents

Rank	President	GPA	Grade	Rank	President	GPA	Grade	Rank	President	GPA	Grade
1	FDR	4.00	A	15	Cleveland	2.50	B-/C+	29	Madison	1.00	D
2	Harding	3.80	A	16	Jefferson	2.40	B-/C+	29	Monroe	1.00	D
2	Hayes	3.80	A	16	Taylor	2.40	B-/C+	29	W. Bush	1.00	D
2	McKinley	3.80	A	16	Wilson	2.40	B-/C+	32	Carter	0.86	D
5	Fillmore	3.60	A-	19	H. Bush	2.33	B-/C+	33	A. Johnson	0.60	D-
5	Washington	3.60	A-	20	Grant	2.30	B-/C+	33	Buchanan	0.60	D-
7	J. Adams	3.40	A-/B+	21	Polk	2.20	C+	33	JQ Adams	0.60	D-
7	Truman	3.40	A-/B+	21	Tyler	2.20	C+	33	Jackson	0.60	D-
9	JFK	3.20	B+	23	Nixon	2.14	C+	37	Arthur	0.20	F+
10	Clinton	3.00	B	24	Ford	1.90	C	37	Harrison	0.20	F+
10	Reagan	3.00	B	25	Teddy	1.86	C	39	Hoover	0	F
12	Ike	2.80	B	26	Lincoln	1.33	C-/D+	39	Van Buren	0	F
12	LBJ	2.80	B	27	Pierce	1.25	D+				
14	Coolidge	2.60	B-	28	Taft	1.20	D+				

Notes: Average GPA = 2.04, Standard Deviation = 1.21, Max/Min = 4/0.

Table 3: Economic Grades and Rankings of the Administrations*

Rank	Admin	GPA	Grade	Rank	Admin	GPA	Grade	Rank	Admin	GPA	Grade
1	FDR1	4.00	A	20	Clinton1	2.63	B-	39	Wilson2	1.14	D+
1	Hayes	4.00	A	21	LBJ	2.60	B-	40	Monroe1	1.00	D
3	FDR2	3.80	A	22	Clevelnd2	2.50	B-/C+	40	Monroe2	1.00	D
3	FDR3	3.80	A	23	Jeffersn1	2.40	B-/C+	40	Pierce	1.00	D
3	Harding	3.80	A	23	Taylor	2.40	B-/C+	40	Reagan2	1.00	D
6	McKinley	3.57	A-	25	Coolidge	2.38	B-/C+	40	Taft	1.00	D
7	Reagan1	3.50	A-/B+	26	Grant1	2.20	C+	40	W. Bush2	1.00	D
8	Fillmore	3.43	A-/B+	26	Polk	2.20	C+	46	Carter	0.86	D
9	J. Adams	3.29	A-/B+	26	Tyler	2.20	C+	47	Lincoln	0.80	D
10	JFK	3.20	B+	29	H. Bush	2.14	C+	48	A. Johnson	0.71	D-
10	Truman2	3.20	B+	30	Clevelnd1	2.00	C	48	JQ Adams	0.71	D-
10	Washingtn2	3.20	B+	30	Ike2	2.00	C	50	Buchanan	0.57	D-
13	Washingtn1	3.17	B+	30	Nixon1	2.00	C	51	Harrison	0.40	D-/F+
14	Clinton2	3.00	B	30	Truman	2.00	C	51	Jackson2	0.40	D-/F+
14	Grant2	3.00	B	34	Jackson1	1.40	C-/D+	51	Madison2	0.40	D-/F+
14	Wilson1	3.00	B	35	Ford	1.33	C-/D+	54	Arthur	0.33	D-/F+
17	Ike1	2.83	B	36	Jeffersn2	1.29	C-/D+	55	Teddy2	0.20	F+
17	Madison1	2.83	B	37	Nixon2	1.20	D+	56	Hoover	0.00	F
19	Teddy1	2.80	B	37	W. Bush1	1.20	D+	56	Van Buren	0.00	F

Notes: Average GPA = 2.00, Standard Deviation = 1.18, Max/Min = 4/0. *See online Appendix for an explanation of the codings of irregular administrations.

6. Hypotheses

The economic performance GPAs allow us to test for general correlations and thereby generate hypotheses about the relationship between the President and the economy. The variables considered below include political party type, federal veto players, partisanship, war, conomic class origins, intelligence and open-mindedness, pre-political career, birth order, historical greatness, and darkhorse vs. well-vetted presidents. Notably, this article does not analyze the effects of economic performance on elections, which is covered elsewhere by a vast scholarly literature (Lewis-Beck and Stegmaier, 2000; Nadeau and Lewis-Beck, 2001; Geys, 2006; Lewis-Beck, Nadeau, and Elias, 2008; Vavreck, 2009; Evans and Pickup, 2010; Singer, 2011). Since correlations cannot show causal mechanism, and do not control for conditional variables, *this is a hypothesis generation exercise intended to motivate further research.* Each of these observations is also robust to whether only the base data were used (per capita GDP, inflation, balance of payments) or the overall dataset (which includes unemployment, stock market, interest rates, inequality, and currency strength).

6a. The Economy Performs Better Under Pro-business Party Presidents: The twenty-one presidents belonging to parties which favored business interests (Federalists, Whigs, Republicans) had a better average GPA (2.24 vs.

1.82) than did those Presidents belonging to parties which were more pro-farmer, pro-labor, or pro-consumer (Democrat-Republicans, Democrats, as well as John Tyler and Andrew Johnson).[4]

6b. A Divided Congress is Not an Obstacle to a Strong Economy: Just as the President can veto an act of Congress; so too can a stubborn Congress refuse to pass policies supported by the President. Therefore maybe divisions within or between Congress and the Presidency affect economic performance. "Veto players" are defined here as the average of the number of Congressional chambers (House, Senate) dominated by a majority party different from that of the sitting President. The range is from zero (the majority of both houses of Congress is the same party as that of the President) to two (the majority of both houses of Congress is a different party than that of the President). Although there is no general correlation between number of veto players and economic GPA, there are some interesting observations worth reporting. The highest average GPA (2.46) went to the eight administrations in which only one house was dominated by the same party as the President (Washington2, Cleveland1, Cleveland2, Truman1, Ike1, Reagan1, Clinton1, W. Bush2). Meanwhile the lowest average GPA (1.06) went to the eight administrations which entered a homogenous Federal government, then one house flipped parties while the other remained dominated by the party same as the President's (Polk, Pierce, Buchanan, Grant2, Arthur, Harrison, Taft, Hoover).[5] Interestingly, the four administrations which suffered complete party reversals in Congress (from zero or one veto player to two veto players) did not suffer much, enjoying a merely average GPA (2.09) (Tyler, Hayes, Wilson2, Reagan2).

6c. Partisanship Matters: If we combine veto players with party identification, then further observations can be made. Note however that any correlations regarding different party combinations of Executive and Legislature must be taken with a grain of salt because sample sizes are often small, hence random effects of a particular Presidency or time period can be mistaken for systematic effects. For example, the two administrations with a pro-business president and one pro-business house (Washington2, Reagan1) average the highest GPA (3.35). These are followed by the ten administrations which enjoyed pro-business party (e.g Federalist, Republican) unity across all branches of government with an average GPA of 2.34 (Washington1, J. Adams, Lincoln, Grant1, McKinley, Teddy1, Teddy2, Harding, Coolidge, W. Bush1). The sixteen administrations which enjoyed "not pro-business" (e.g. Democrat) party unity across the government followed next with a slightly above average GPA of 2.17. The sixteen administrations during which one house of Congress changed its majority party did poorly. Specifically, the seven Democrat administrations which lost a house during their term scored on average only slightly better (GPA 1.72) than the nine Republican administrations which lost a house during theirs (GPA 1.51). The worst average GPA (1.3) was earned by those two executive-legislature combinations deemed too complex to neatly classify in party terms (Jackson2, Tyler).

6d. War Aids Economic Performance: Though not a novel finding, the rankings confirm that, on average, wartime administrations have a higher economic GPA (2.36) than "peacetime" administrations (1.88). This comparison used a conservative definition of wartime Presidents (Madison1, Polk, Lincoln, McKinley, Wilson2, FDR3, Truman2, JFK, LBJ, Nixon1, H. Bush, W. Bush1, W. Bush2). This difference in GPAs was robust to inclusion/exclusion of John Adams' Quasi-War and Nixon's post-Paris Peace Accords military participation in Vietnam. However, more expansive definitions of wartime (for example, to include periods of high external threat) erode this difference in average economic GPAs.

6e. Middle-Class Presidents Perform Best: Economic class seems to matter for presidential performance. Two competing classification approaches were used here based on subjective judgments of biographical material. In both approaches, presidents raised in middle-class backgrounds averaged the best economic GPAs, while those raised in lower class backgrounds averaged the lowest GPAs. Fourteen presidents can be assigned to the "upper class" of their generation with relative confidence (Washington, Jefferson, Madison, J.Q. Adams, Tyler, Polk, Taylor, Pierce, Buchanan, Teddy, FDR, JFK, H. Bush, W. Bush). Four presidents can be said to have been

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[4] Although elected as a pro-business Whig, Tyler vetoed several Whig bills and was quickly abandoned by his cabinet and his party. Although elected as Vice President on a Republican (temporarily renamed National Union Party) ticket, Andrew Johnson rose in politics defending labor and farmers, and he was a pro-Union Democrat when the Civil War erupted.
[5] If we focus solely on the occurrence, rather than the direction, of the flip, then Jackson2, which entered with the Senate in opposition but ended with party unity across both houses, brings the GPA down further to 0.99.

raised in relatively "lower class" environments (Fillmore, A. Johnson, Hoover, Nixon). Fifteen presidents appear to have been raised in relatively "middle class" environments for their time period (Monroe, Grant, Hayes, Arthur, Cleveland, Harrison, McKinley, Wilson, Harding, Coolidge, LBJ, Ford, Carter, Reagan, Clinton). The remaining seven Presidents are the basis for the two different classification approaches. In one approach, they were all lumped into the middle class. In a second approach, the wealthier were elevated to "upper class" (Taft) and the poorer demoted to "lower class" (Adams, Jackson, Van Buren, Lincoln, Truman, Ike). In both tabulations the middle class presidents received the highest average GPA (2.12, 2.27), while presidents from the poorest backgrounds received the lowest average GPA (1.59, 1.79), and those raised in the wealthiest environments were close to average (2.05, 1.99).

6f. Brains and Open-Mindedness Matter, But Only at the Extremes: In 2006, Dean Simonton used historical and biographical material to estimate the intellectual brilliance and open-mindedness of the US presidents (Simonton, 2006). The data suggest that these qualities may matter for economic performance, but only at their extremes. Overall, there is no substantive correlation between Presidents' economic GPA and Simonton's measures of intellectual brilliance (correlation = 0.05) or openness (correlation = 0.01). Indeed, some of the office's most intellectual men, such as J.Q. Adams and Hoover, received amongst the lowest economic-GPAs; while some of the men judged by historians to be relatively unintellectual received quite high economic marks (e.g. Harding, Fillmore). But the relation does hold at the extremes where brains may count for something. The top ten most intellectually brilliant presidents scored a substantially higher average economic GPA (2.24) than the bottom ten (1.72). Identical observations can be made about openness: correlation at the extremes, but not overall. For example, Madison, J.Q. Adams, Lincoln, and Carter were all deemed to have been open to new experience and ideas, but scored poorly on economic performance; while Truman and LBJ were fairly closed and stubborn but did well economically. Yet, at the extremes, openness may matter. For while the top ten most open presidents maintained a merely average economic GPA (2.00), it was significantly higher than that of the ten least open presidents (1.53).

6g. The President's Resume Doesn't Matter Much: The jobs held by the President prior to entering politics do not appear to matter much for economic performance. Three categories of profession appear to capture roughly thirty presidents before they entered politics: military, law, and agriculture. The six presidents with the most military experience (Washington, Monroe, Jackson, Taylor, Grant, Ike) scored just above average (2.10). The military men do even better (2.16) if Teddy, JFK, and Ford are allowed to join their ranks. The group of eighteen lawyers scored just below average (1.98). The four presidents who arguably spent the most time on the farm (Jefferson, Madison, Carter, Truman) also scored just below average (1.91). Clearly, this area requires closer study. Due to subjective classification strategy (e.g. was Harding a "journalist" or "businessman"? What exactly was Teddy's pre-political career?), job-hopping, dual professions, and changing definitions of work, the classification of pre-presidential "career" is not straightforward and sample sizes can be small (Uscinski and Simon 2012). As an aside, a quick test of birth order revealed no significant differences in economic performance, even when adjusted to count "eldest surviving son" as first-born (Andeweg and Van Den Berg, 2003). Interestingly, prior time spent in political office does not much affect presidential performance, nor does coming from "outside the beltway". But there does seem to be a sweet-spot in that the ten presidents with more than two, but less than ten, years of prior experience inside the Federal government earned a relatively high average GPA (2.42). Meanwhile the thirteen men who spent ten to twenty years inside the federal government before becoming president earned a relatively low average GPA (1.77).

6h. Historical "Greatness" Doesn't Indicate Economic Success: The most well-known Presidential rankings are surveys of experts which judge the executives on overall "greatness" or "leadership" (Schlesinger, 1997; C-SPAN; Taranto and Leo, 2005; Ridings and McIver, 2000). There is only a weak correlation between these expert surveys of historical "greatness" and the economic performance rankings reported above. The correlations of some of the most prominent expert surveys with the economic performance GPAs are as follows: C-SPAN Historians Survey of Presidential Leadership overall scores, 2009 (0.38),[6] Federalist Society-Wall

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[6] http://legacy.c-span.org/PresidentialSurvey/Overall-Ranking.aspx. Note that the correlation with C-SPAN's "Economic Management" index 2009 is somewhat higher (0.46).

Street Journal (0.27),[7] and Schlesinger 1996 (0.29).[8] Clearly there are tensions between these "greatness" surveys and the economic performance grades reported above. To take just one example, Lincoln's receives relatively low economic GPA (1.33), but a perennially high "greatness" ranking. This can be interpreted in multiple ways. First, one could argue that saving the Union and successfully prosecuting the Civil War was far more important than improving the next quarter's GDP. That is, there are more important matters than economic performance. This might explain the overall low correlation between my economic rankings and rankings compiled through surveys of historians. Alternately, it might signal a general lack of consideration of hard economic data by these historians. Are we allowing some presidents to gather impenetrable mantles of "greatness" or "ignobility" that ignores cold hard data? Or perhaps historians might be systematically biased by their field or politics (Tilley and Hobolt, 2011; Evans and Pickup, 2010). Finally, and perhaps more accurately, one could argue that Lincoln actually made the best moves possible for the US economy. Retaining the South was essential for the economic prosperity of the United States. Such an argument might consider the counterfactual of what US economic performance would look like if the Confederacy had been allowed to leave it.

6i. Darkhorses and Well-Vetted Presidents Perform Equally Well: A new "Leader Filtration Theory" (LFT) of Presidential leadership, put forward by management scholar Gautam Mukunda, makes a distinction between "modal" and "outlier" presidents (Mukunda, 2012). Modal presidents are those who have been well vetted by the competitive political system, outliers are those who have not. LFT posits that leaders are chosen in two stages. In the first stage, leaders are selected from a pool of candidates via a filtration process that homogenizes the pool. Examples of Presidential filtration include time spent in the House, Senate, as a cabinet member, state governor (non-ceremonial), or as a flag officer in the military. Well filtered leaders are fungible because those who are elected into the Presidency are highly similar to those who almost get the job. However, sometimes filtration is abbreviated or bypassed. When this occurs, an outlier leader who is quite different from the potential alternates can gain power. If, as President, an outlier leader faces weak constraints, either from within government or outside it, then "an unfiltered leader can have a very large impact on outcomes. Such leaders are likely to display a high degree of variance in their performance." (Mukunda 2012, 2). Mukunda codes the following as "outlier" presidents: Washington, Tyler, Polk, Fillmore, Pierce, Lincoln, A. Johnson, Grant, Arthur, Cleveland, Harrison, Teddy, Wilson, Harding, Coolidge, FDR, Ike, Carter, W. Bush.[9] The economic performance data does not support LFT. There is no significant difference in economic performance between the twenty-one "modal" and nineteen "outlier" Presidents. Their average grades were statistically indistinguishable (modal GPA 2.03, outlier GPA 2.06), while their standard deviations slightly contradicted LFT (modal SD 1.25, outlier SD 1.19). Finally only four "outlier" Presidents appear amongst the top ten economic performers, while another four "outliers" appear amongst the bottom ten. This evidence does not eliminate LFT as a viable theory, but only fails to support its application to short-term economic performance.

7. What's the Point?

Some readers might be tempted to dismiss this exercise as a bit of intellectual fun with numbers; they should not be so hasty. The economic rankings reported above are not intended to create the impossible (e.g. a perfectly unbiased and error-free ranking of the presidents). Rather, the objective here is to eliminate bias and statistical error where possible, and to be transparent about that which might remain. If one goal of science is to advance empirical measures through experimentation, then the data-based rankings above are meant seriously as a step in this evolution.

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[7] Survey of 132 prominent professors of history, law, and political science balanced with approximately equal numbers of experts on the left and the right, George W. Bush not included (Taranto and Leonard, 2000).

[8] Poll of thirty-two historians (Schlesinger, 1997).

[9] Mukunda's coding rules are summarized as follows: "All Dark Horse candidates and all idiosyncratically chosen Vice Presidents who become President are classified as Unfiltered. Eight years of national pre-Presidential political experience serves as a dividing line. Those with significantly more than eight years of experience should be classified as Filtered. Those with significantly less should be classified as Unfiltered". Dark Horses are defined as "If a President was nominated only after multiple ballots at the convention and had received little or no support on early ballots, he was a Dark Horse candidate." Idiosyncratic Vice Presidents are those "whom no one had considered a plausible candidate for the Presidency. All such Vice Presidents who are elevated to the Presidency...[by] the death of the President...are always Unfiltered." (Mukunda 2011, 105-107, Appendix I).

More importantly, scholars should not err in letting the perfect (or near perfect) be the enemy of the good which these rankings can do, which is to provoke constructive debate over Presidential performance and responsibility. For example, these rankings highlight the fact that even non-partisan, non-ideological decisions about scope and historical context have a subjective component which can affect performance metrics. That is, economic performance is the product of a multitude of forces and actors. The effects of some of these variables may not be realized for decades. Therefore any ultimate judgment on an individual president will depend on the judge's scope conditions. Thus it is important for rankings, and their advocates, to be clear about their subjective aspects, rather than advance the pretense of objectivity. Since such naïve candidness will likely be infrequent, it is imperative that we scholars enter this debate so as to identify and publicize the non-scientific or biased aspects of agenda-driven rankings.

Another goal of this article is to show that the scientific analysis of economic data can be a useful step towards a more objective consensus. Despite the problems with subjectivity, it remains important for scholars and voters to thoughtfully debate how much any particular president is responsible for the economy on his watch relative to other actors. Different degrees of institutional responsibility have existed across history. Some scholars argue further that the president's economic advisors can also make an substantial impact on policy, hence performance (Goff, 2010). Then of course, there are the ethical judgments of how to divvy up responsibility between actors, institutions, and environment. Again, all of these have subjective components which can vary across different observers.

The rankings presented above have demonstrated one way to approach these problems. Readers are encouraged to dig deeper into history, gather data, try their own rankings, and perhaps use them to think more deeply about how they view (and vote for) the President. Put simply, the message of this article is that, if "it's the economy, stupid", then we need to make stronger efforts to properly judge economic performance, and to assign credit and blame where they are most deserved. These rankings are meant to constitute a scientific step in this direction.

Data and Methods Appendixes

Appendix 1. Data Overview

1a. Base Measures

Mainstream economists, policymakers, and observers generally applaud an economy which simultaneously achieves four goals: increases national wealth, minimizes unemployment and inflation, and maintains a low balance of payments burden.[10] I therefore consider this combination of indicators to be my primary or "base" measure of economic performance. For my measure of change in national wealth, I use change in real gross domestic product per capita (in 2005 constant dollars). For inflation, I use consumer price index data, where the base period (=100) is the 1982-84 annual average. A simple percentage change in price levels is calculated for each administrative term. For unemployment, a simple change in unemployment as percentage of total civilian labor force is calculated for each administrative term. For change in balance of payments burden, I average the "grades" of two measures: change in trade balance and change in budget surplus, both as a percentage of real GDP. For trade balance, I calculate exports minus imports as a percentage of real GDP. For budget surplus, I use the annual US government budget surplus/deficit, also as a percentage of real GDP. A simple change in these percentages is then calculated for each administrative term.

1b. Secondary Measures

In order to construct my "overall" grades, I append to my "base" measures four additional indicators: stock market performance, currency strength, interest rates, and economic inequality. I include these additional indicators because 1) they are generally accepted as broad measures of macroeconomic performance, 2) reliable time-series data for them exist over long periods, and 3) they do not correlate highly with each other (or with the "base" indicators) and therefore likely capture different aspects of economic performance (see Appendices, Table A). Data with these characteristics are rare. Furthermore, the "base" measures employ only four indicators, one of which (unemployment) contains data only from 1890 onward. Critics might argue that this is insufficient data upon which to base Presidential rankings. Therefore these secondary measures bring valuable scope and depth to the calculation. Methodological issues (correlations, consistency, commensurability) are discussed below.

The secondary measures are calculated as follows. Stock market performance is calculated as the percentage change in the Dow Jones Industrial Average during each administrative term. For currency strength, I calculate the change in the price of the British pound in US dollars for each administrative term. The British pound is a major currency throughout the time period under consideration, and therefore offers a rough *prima facie* indicator of US dollar strength. For interest rates, I use the US long-term rates (consistent series) to calculate the absolute change in interests rates (in percentage points) during each administrative term. Decreases in interest rates are judged as good for the overall economy, while rising rates suggest poorer conditions. For economic inequality, I use the change in the share of aggregate income received by wealthiest five percent of Americans. Since rising inequality is bad for a variety of socio-economic indicators, and perhaps even for democracy itself, decreases in economic inequality (a declining share of national income going to the wealthy) receive higher grades than increases in economic inequality.[11]

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[10] Mankiw, N Gregory. 2011. *Principles of Macroeconomics 6th Edition*. Stamford, CT: South-Western College Publishers.

[11] Kaplan GA; Pamuk ER; Lynch JW; et al. 1996. Inequality in Income and Mortality in the United States: Analysis of Mortality and Potential Pathways. *British Medical Journal* 312(7037): 999-1003; Kelly, M. 2000. Inequality and Crime. *Review of Economics and Statistics*. 82(4): 530-539 ; Boix, Carles. 2008 Economic Roots of Civil Wars and Revolutions in the Contemporary World. *World Politics* 60(3):390-437.

Appendix 2. Grading Methodology

2a. General Approach

In calculating the grades and GPAs, each of the economic indicators is weighted equally and graded in an intuitive manner (see below), except for two indicators which need further discussion before proceeding: inflation and balance of payments. Although high inflation is generally disruptive to the macroeconomy, negative inflation is generally viewed as an economic catastrophe. Therefore lower inflation should not blindly earn a President a higher grade. Instead, adhering to assertions made by scholar-policymakers such as Ben Bernanke and Lawrence Summers, the highest grades are assigned to inflation in the 0-2 percent range.[12] As inflation increases above 2 percent the inflation "grade" decreases. Since deflation is generally to considered to be a worse situation and a more difficult policy problem to solve than inflation, the worst grades are reserved for negative inflation.[13]

For balance of payments, I grade two indicators separately (trade balance per GDP and budget surplus per GDP) and then average these two grades to arrive at a grade. Grades for budget surplus and trade balance are averaged together because, from a balance of payments point of view, they constitute somewhat orthogonal aspects of the same phenomenon (correlation = 0.56) with different mixes of private and public obligation, nor does one necessarily determine the other. Also, trade deficits have historically prompted distinctly different policy responses from government than have budget deficits.[14]

Timing is also controversial. It is not clear precisely when a new president becomes responsible for the behavior of the macroeconomy. Some scholars argue that presidents might have an effect on the economy immediately upon taking office, with the cases of FDR and Fillmore perhaps serving as the best examples.[15] However, a one year lag is often used by most ranking exercises which use quantitative data.[16] More recently, surveys have suggested that the public may award a new president as long as a two year honeymoon.[17] Since there is no consensus as to how long of a "honeymoon" should be granted, the ranking exercise described below was calculated separately for honeymoons of zero, one, and two years.[18]

The economic performance GPAs were calculated in the following manner. First, each economic indicator was separately graded and curved for each presidential administration. All indicators were treated as individual grades and given equal weights (except for the two indictors which comprise the balance of payments grade, discussed above). In my first grading algorithm, I curved the grades into strict quintiles: the top 20 percent of performers received an "A" (4 points), the second 20 percent received a "B" (3 points), and so forth. Administrations with the same numerical grade were given the same letter grade. Since there are fifty-seven administrations in my sample, unequal quintiles were determined by the gap between numerical grades. That is, the numerical distance between letter grade divisions was maximized while still adhering as tightly as possible to strict quintiles. After the individual indicators were graded, they were combined via a simple average into an overall GPA for each administration. To arrive at Presidential grades, those executives with two terms (or more, in the case of FDR) had their two administration grades averaged into a single Presidential grade before being curved into letter grades according to the "strict quintiles" approach described above.

[12] Bernanke, Ben S. 2003. "A Perspective on Inflation Targeting", Remarks at the Annual Washington Policy Conference of the National Association of Business Economists, Washington, D.C. March 25, 2003; Summers, Lawrence. 1991. "How Should Long-Term Monetary Policy Be Determined?" *Journal of Money Credit and Banking* 23(3), part 2: 625-631.

[13] "Deflation in America: The Greater of Two Evils." May 7th 2009. Economist; Williams, John C. 2009. The Risk of Deflation. *FRBSF Economic Letter*. Number 2009-12 (March 27, 2009) Federal Reserve Bank of San Francisco

[14] Lovett, William A., Alfred E. Eckes, Jr. and Richard L. Brinkman. 2004. *U.S. Trade Policy: History, Theory, and the WTO*. Armonk, NY: M.E. Sharpe; Eckes, Alfred E. Jr. 1995. *Opening America's Market: U.S. Foreign Trade Policy Since 1776*. Chapel Hill, NC : University of North Carolina Press; Wood, John H. 2009. *A History of Macroeconomic Policy in the United States*. New York: Routledge; Brownlee, W. Elliot. 2004. *Federal Taxation in America: A Short History*. New York: Cambridge University Press.

[15] Eggertsson, 2008; Smith, Elbert B. 1988. *The Presidencies of Zachary Taylor and Millard Fillmore*. Lawrence, KS: University Press of Kansas.

[16] Dolan, Frendreis, and Tatalovich. 2009.

[17] A July 5 - 11, 2011 Quinnipiac University poll of 2,311 registered voters found that they blame W. Bush more than Obama for the poor state of the economy 54 - 27 percent, http://www.quinnipiac.edu/polling.xml; Gallup polls similarly reported that the majority of Americans first began to blame Obama, rather than W. Bush, for the economy in mid-September 2011, http://www.gallup.com/poll/149600/Slight-Majority-Blame-Obama-Economy.aspx.

[18] For more, see Samuels, D. 2004. Presidentialism and Accountability for the Economy in Comparative Perspective. *American Political Science Review* 98(3): 425-436.

In a second algorithm, I used a similar procedure to that described above except that, instead of strict quintiles, I imposed my own bell-curve. Specifically I awarded a "C" (2 points) to all scores within one standard deviation of the mean, centered on the mean. For the next half standard deviation, I awarded a "B" or "D" as appropriate; for the remaining administrations, I awarded an "A" or "F" accordingly. This method rewards/punishes extremes in performance, hopefully better identifying truly great or poor executives, while expanding the number of administrations considered to be merely average. Since scores fell within two standard deviations of the mean for most indicators, the result for each indicator was usually a classic bell-curve, though sometimes a bell-curve with a slightly flared tail(s) resulted. Again, administrations with the same numerical grade were given the same letter grade, care was taken to maximize the gap between letter grades while still adhering as closely as possible to the algorithm, and different honeymoons were calculated separately.

The final GPA calculation brought together all of the above GPAs to produce Table 2. For each President, each final "strict quintile" and "bell-curve" GPA for each honeymoon was averaged together and a final GPA assigned. Thus, in order to earn an "A-/B+" or higher, a president or administration had to consistently score well, regardless of honeymoon period or grading algorithm. His excellent performance must be robust across different indicators, time periods, and grading algorithms. No matter how one sliced the quantitative data, the excellent performance came through. Likewise, in order to earn an "D-" or below, a president or administration had to consistently and robustly perform poorly. As grades head from these extremes towards "C", they indicate either mixed, uneven performance (across time, indicator, or algorithm) or consistent performance at a particular grade level. In this final grade assignment, finer gradations were allowed (4=A, 3.75=A-, 3.5=A-/B+, 3.25=B+, 3=B, and so forth) to communicate a more nuanced and honest ranking. To produce Table 3, each administration was treated in a similar manner.

Note that this method of calculating grades and ranks permits only the consideration of raw data, unadjusted for historical context, presidential character, intentionality, or ethical behavior. For example, Lincoln gets no "extra points" for having to fight a Civil War or ending slavery; neither Nixon nor Harding receive any demerits for their administrations' scandals. These relatively subjective adjustments are best left to qualitative case studies, preferably using methodologies which attempt to minimize the personal, political, or cultural biases of the researcher. Perhaps the only obvious bias in my exercise is that towards the mainstream American neoclassical economic assumptions which underlie it; yet, even here, a measure of income inequality is included to judge equity.

2b. Correlations
Table A: Correlation Matrix of Economic Indicators (n=25)

	GDP/cap	CPI	Unemplmt	TradBal/gdp	Budgt/gdp	$-Price of £	Interest	Dow Jones	Inequalty
GDP/cap	1								
CPI	0.14	1							
Unemplmt	-0.86	-0.23	1						
TradBal/gdp	0.07	0.16	-0.01	1					
Budgt/gdp	-0.04	-0.28	0.07	0.37	1				
$-Price of £	0.19	0.05	-0.34	-0.35	-0.29	1			
Interest	-0.14	0.42	0.16	0.21	0.31	-0.06	1		
Dow Jones	0.42	-0.13	-0.49	0.08	0.05	0.32	-0.36	1	
Inequalty	-0.58	-0.17	0.44	-0.12	0.11	-0.02	-0.04	0.28	1

Table A reports the correlation matrix for the data. The only high correlation is between unemployment and per capita wealth. Economic theory and traditional mainstream views of performance both strongly suggest that these two metrics should not be lumped together into a single measure, nor should one be dropped from the calculation. As a robustness test, I ran the ranking exercise without unemployment, and again without wealth. Both tests resulted in only marginal differences in the final GPA calculations. Other relatively high correlations with wealth include inequality and stock market performance, while the pairs of interest rates/inflation, stock market/unemployment, and inequality/unemployment have correlations above 0.40. Again, none of these

correlations are judged as strong enough to produce issues serious enough to degrade the current ranking exercise. Other scholars might consider using factor analysis to construct a single measure from these components, or investigating different weightings of the individual measures.

2c. Consistency

        One issue worth addressing explicitly is GPA consistency across different algorithms. The replication of a finding using different and competing methods is the often the best confirmation of any scientific measure.[19] I therefore report the results, in Table B, of how consistent Presidential grades were across different ranking algorithms (e.g. different honeymoon periods, "straight quintile" vs. "bell-curve" method). Six presidents were "perfectly" consistent. That is, they were awarded the same grade regardless of which honeymoon period or approach towards the grade curve was used. Ten presidents had "high" consistency. In this case all grades but one were identical, and the outlier was the adjacent grade (e.g. one "B" and the rest "A's"). The two Presidents with "above average" consistencies received all grades but one identical, and the outlier was not an adjacent grade (e.g. one "C" and the rest "A's"). The remaining consistency ranks degrade logically; the more the assigned grades varied according to different algorithms, the lower the consistency rank. At the furthest, extreme, Nixon and Ford were ranked as "inconsistent", extremely sensitive to honeymoon period and grade curve. To a certain degree, some correlation between grade and consistency makes sense: the best/worst performers should consistently score high/low across different algorithms, they should be consistently good or bad. Meanwhile, Presidents with mixed performances, hence more average overall GPAs, should be inconsistent across different algorithms. As expected, the most inconsistent Presidencies (Nixon, Ford) returned average overall GPAs. However, there were also some Presidents with average GPAs who were highly consistent in their average-ness (Grant, Tyler, LBJ, Ike).

Table B: Consistency of President's Grades Across Ranking Algorithms*

Perfect:		**High:**		**Above Ave.:**	
FDR	A	Harding	A	Fillmore	A-
Clinton	B	Hayes	A	Washington	A-
Reagan	B	McKinley	A		
Monroe	D	Ike	B-		
Hoover	F	LBJ	B-		
Van Buren	F	Grant	C+		
		Tyler	C+		
		Taft	D+		
		Arthur	F+		
		Harrison	F+		

Average:	
J. Adams	A-/B+
Truman	A-/B+
JFK	B+
Cleveland	B-/C+
Wilson	B-/C+
W. Bush	D
A. Johnson	D-

[19] Tashakkori, Abbas and Charles Teddlie (eds.). 2003. *Handbook of Mixed Methods in Social and Behavioral Research*. Thousand Oaks, CA: SAGE Publications; Denzin, Norman K. 1978. *The Research Act*, 2d ed. New York: McGraw-Hill.

Buchanan	D-					
J.Q. Adams	D-					
Jackson	D-					
Below Ave:			**Poor:**		**Inconsistent:**	
Coolidge	B-	H. Bush	B-/C+		Nixon	C
Polk	C+	Lincoln	C-/D+		Ford	C
Teddy	C	Carter	D			
Pierce	D+	Jefferson	B-/C+			
Madison	D	Taylor	B-/C+			

*Grades shown here are the economic performance grades indicated Table 1

2d. Commensurability

There is also the issue of data commensurability. Data are available from 1789 onwards for some indicators, but other time series start more recently (Table 1). There is no mathematically optimal way to deal with this issue; tradeoffs are involved. Imputing or estimating the missing data are too fraught with difficulty and error to be a reliable option.[20] A conservative solution would be to drop the incomplete time-series, but I argue that this would eliminate much valuable data and likely result in an unrepresentative, biased measure, at least for some presidents. My solution is to err on the side of more information. I use all the data available to produce the grades and rankings (Tables 1 and 2), but show the correlation of GPAs between the different data combinations, and let the readers judge for themselves. This approach has merit in academic practice. To continue with the analogy of grades in school, if some students miss some weekly quizzes for health reasons, most teachers do not simply drop those quizzes for all students in the final grade calculation. Rather, if no make-ups are permitted, then one standard practice is to drop the missed quizzes from those particular students' grade calculation. This is precisely the solution used here towards the Presidential grades. This solution may still introduce bias for some Presidents, but I argue that the informational gains outweigh the penalties. Also all data are made available for readers to investigate for themselves. Interested scholars can then address those instances which they find to be controversial using case-study research or more in-depth quantitative methods.

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[20] Feinstein, Charles H. and Mark Thomas. 2002. A Plea for Errors (Historical data, Industrial Revolution). *Historical Methods* 35(4):155-165

Appendix 3. Data Sources

Several datasets are taken from the MeasuringWorth Project based out of the Economics Department at the University of Illinois at Chicago. For more information see http://measuringworth.com/aboutus.php.

3a. Primary Indicators

GDP: Millions of 2005 constant dollars. Johnston, Louis and Samuel H. Williamson. 2011. "What Was the U.S. GDP Then?" MeasuringWorth. http://www.measuringworth.org/usgdp/

Inflation: Officer, Lawrence H. 2011. "The Annual Consumer Price Index for the United States, 1774-2010," MeasuringWorth. http://www.measuringworth.com/uscpi/

Employment: 1890-1947 data from "Labor Force, Series D 85-86 Unemployment 1890-1970" Chapter D "Labor" *Historical Statistics of the United States: Colonial Times to 1970, Part 1* (Wash DC: US Department of Commerce) page 135; 1948-2010 data from "(Seas) Unemployment Rate" Series Id: LNS14000000 (Seasonally Adjusted). 1947-2010 Labor Force Statistics from the Current Population Survey Bureau of Labor Statistics, US Department of Labor, accessed online at data.bls.gov.

Exports, Imports: 1790-1970 data from US Bureau of the Census. 1975. *Historical Statistics of the United States, Colonial Times to 1970, Part 2*, "Chapter U: International Transactions and Foreign Commerce". Washington DC: USGPO: "Series U 1-25 Balance of Payments 1790-1970": pp. 864-866, columns labeled "Exports of Goods & Services, Total" and "Imports of Goods & Services, Total". 1971-2010 data are Exports, Imports of goods and services and income receipts from Bureau of Economic Analysis, U.S. International Transactions Accounts Data, Table 1. U.S. International Transactions. I subtract imports from exports, then compute the result as a percentage of real GDP (rGDP), and finally calculate the change in the per-rGDP figure over the administration. I find there is little substantive difference between the old 1790-1970 US Census numbers and the BEA data, nor does the inclusion/exclusion of income receipts, etc. make a significant difference in the outcome.

Federal Budget: 1790-1900 data from US Bureau of the Census. 1975. *Historical Statistics of the United States, Colonial Times to 1970, Part 2*, using the following tables on page 1104-1105: Series Y 335-338 "Summary of Federal Government Finances--Administrative Budget 1789-1939" From this table use the column labeled column labeled "Surplus or Deficit". 1901-2010 data from "Table 1.1—Summary of Receipts, Outlays, and Surpluses or Deficits (): 1789–2016" from *Budget of the United States Government* Historical Tables Fiscal Year 2012.

Govt. Debt: 1790-1939 data from *Historical Statistics of the United States: Colonial Times to 1970, Part 2*. Bureau of the Census, US Department of Commerce. Washington DC 1975 using the following tables on page 1117-1118, Series Y 493-504 "Public Debt of the Federal Government 1791-1970" in Chapter Y: Government-Elections and Politics (Series Y 1-271); from this table use the column labeled "Total Public Debt". 1940-2010 data from Table 7.1—Federal Debt at the End of Year: 1940–2016 from *Budget of the United States Government*: Historical Tables Fiscal Year 2012, column entitled "Gross Federal Debt"

3b. Secondary Indicators

Value of Dollar: Officer, Lawrence H. 2011. "Dollar-Pound Exchange Rate From 1791" MeasuringWorth. http://www.measuringworth.org/exchangepound/

Interest Rates: US Long-Term interest rates (Consistent Series). Yield on long-term bonds, those that mature in at least 15 or 20 years. The "consistent series" involves smoothing of the corresponding contemporary series, showing the interest rate from the standpoint of the year-2001 observer. From Officer, Lawrence H. 2011. "What Was the Interest Rate Then?" MeasuringWorth. http://www.measuringworth.com/interestrates/

Dow Jones: annual percentage performance of the Dow Jones Average (close on Dec 31 of prior year to Dec 31 close of current year). Williamson, Samuel H. 2011."Daily Closing Values of the DJA in the United States, 1885 to Present," MeasuringWorth. http://www.measuringworth.com/DJA/

Economic Inequality: 1913-1948 data from Lindert, Peter H. 2000. Three Centuries of Inequality in Britain and America.In A.B. Atkinson and François Bourguignon (eds.), *Handbook of Income Distribution*, volume 1. Amsterdam: Elsevier Science, Ch. 3 (pp. 167-216). 1949-2010 data from. Table F-2. Share of Aggregate Income Received by Each Fifth and Top 5 Percent of Families, All Races: 1947 to 2010 from U.S. Census Bureau, Current Population Survey, Annual Social and Economic Supplements. For the one-year and two-year honeymoon calculations, for 1949 the percentage change in CPS data is used to estimate the shifted change in Kuznets data in Linder. Since the measurement sought is percentage point change during each administration, data consistency within administrations is important; investigation of the data suggests that differences between datasets are minor and should not affect the calculations performed in this article.

Appendix 4. Irregular Presidential Administrations

In determining the assignment of irregular administrative terms, I took historical context into account, deciding case-by-case which administration should be assigned to particular years. Alternative approaches might rule that any President serving less than one year has his time awarded to his successor. Or one could take the data's point of view, and award the year to whomever held the majority of that year. I leave these alternate calculations to other scholars, however my suspicion is that they would not be significantly different than those presented here. Indeed, my practice of triangulation using different honeymoon periods should address these issues.

Table C: Irregular Terms of Office

President	Term	Approx Time in Office	Data Treatment
W.H. Harrison	Mar 4, 1841 – Apr 4, 1841	1 month	Omitted. 1841 awarded to Tyler
Taylor	Mar 4, 1849 – Jul 9, 1850	15 months	Two years, 1849 and 1850
Fillmore	Jul 9, 1850 – Mar 4, 1853	32 months	Three years, 1850 through 1852 inclusive
Lincoln2	Mar 4, 1865 – Apr 15, 1865	1 month	Omitted. 1865 awarded to A. Johnson
Garfield	Mar 4, 1881 – Sep 19, 1881	6 months	Omitted. 1881 awarded to Arthur.
McKinley1	Mar 4, 1897 – Mar 4, 1901	48 months	Five years, 1897 through 1901 inclusive.
McKinley2	Mar 4, 1901 – Sep 14, 1901	6 months	Omitted. 1901 awarded to McKinley1.
TR1	Sep 14 1901 – Mar 4, 1905	42 months	Three years, 1902 through 1904 inclusive
Harding	Mar 4, 1921 – Aug 2, 1923	27 months	Three years, 1921 through 1923 inclusive.
Coolidge	Aug 2, 1923 – Mar 4, 1925	19 months	Five years, 1924 through 1928 inclusive, treated as a single term.
FDR4	Jan 20, 1945 – Apr 12, 1945	3 months	Omitted. 1945 awarded to Truman1.
JFK	Jan 20, 1961 – Nov 22, 1963	35 months	Three years, 1961 through 1963 inclusive.
LBJ	Nov 22, 1963 – Jan 20, 1969	62 months	Five years, 1964 through 1968 inclusive, treated as a single term.
Nixon2	Jan 20, 1973 – Aug 9, 1974	19 months	Two years, 1973-1974.
Ford	Aug 9, 1974 – Jan 20, 1977	29 months	Two years, 1975-1976.

W.H. Harrison (1841): omitted, time awarded to Tyler. Harrison served as President for only one month, March 4-April 4, during which time he mostly dealt with appointments or was ill. Congress was out of session, hence legislative and policy activities were minimal. Harrison did call the newly elected 27th Congress into special session, but it did not meet until almost two months after his death. By September, all of Harrison's cabinet had resigned from Tyler's administration, except for Secretary of State Daniel Webster.

Taylor (1850): Awarded two years, 1849 and 1850. In the Taylor-Fillmore case, both men can arguably claim 1850 as their own because: 1) the transfer of power occurred in mid-year; 2) the Federal government was active during this time (Congress was in session); 3) Presidential action had an immediate impact on policy (specifically the Compromise of 1850); 4) Taylor and Fillmore differed distinctly in their policy and administrative philosophies. Taylor believed in a passive executive and rarely included Vice President Fillmore in his councils or agenda. Taylor also opposed the spread of slavery, hence likely would have vetoed elements of the Compromise of 1850, possibly even fomented violent confrontation with the South. See below.

Fillmore (1850): Awarded three years, 1850-1852, inclusive. Fillmore had an immediate effect on policy upon taking office. Fillmore accepted the resignations of the existing cabinet members and replaced them all, a hitherto unprecedented change in top advisors and department heads. Also, Fillmore had a distinctly different theory of the Presidency, and decidedly different views on slavery, than his predecessor. His activist approach in support of the Compromise of 1850 ensured its passage. This had implications for the markets for labor, cotton, and land.

Lincoln2 (1865): omitted, time awarded to A. Johnson.

Garfield (1881): omitted, time awarded to Arthur. Garfield had an active administration of only four months (March 4 to July 2). During this time, his only major economic action was to negotiate a re-financing of US Civil War era bonds. He also reasserted the Presidential prerogative over the Senate in executive appointments and addressed the US Post Office's "Star Route" fraud, thus advancing civil service reform. However, much of his active administration was spent on dealing with a barrage of office-seekers which culminated in a standoff with fellow Republican and New York machine boss, Senator Roscoe Conkling, perhaps contributing to his assassination by a mentally ill patronage-seeker. After Garfield was shot, his biographer reports that "The only *bona fide* executive business that Garfield completed during his illness was the signing of an extradition treaty to return a jailed forger to Canada...In effect, for most of the summer of 1881, the United States of America was without a functioning chief executive."[21]

McKinley2 (1901): omitted, time awarded to McKinley1. McKinley's brief second term was largely devoted to foreign policy, specifically settling issues in Cuba and the Philippines. Congress went out of session after early March, not to return until months after his assassination. From May onwards, McKinley either traveled or vacationed at home in Ohio.

Harding (1923): awarded 1921-1923 inclusive.

Coolidge (1923): Awarded 1924-1928 inclusive. Congress was out of session when his predecessor, Harding, died (Aug 2, 1923) and did not return to session until early December. A former Massachusetts governor with no Federal experience, Coolidge was entirely new to Washington when he arrived. As vice president, Coolidge had been allowed to join Harding's cabinet meetings, but he did not participate. He was not deeply involved in any Harding agenda items. Instead he was given speeches to make, but otherwise his biographer reports that "Coolidge wasn't much of a force in politics, the capital or the nation".[22] After his succession to the presidency, Coolidge retained Harding's cabinet and policy agenda at first. He asserted his own stamp on it only in 1924.

FDR4 (1945): omitted, time awarded to Truman1. FDR's final term lasted only three months, Jan 20 – April 12.

JFK (1963): awarded three years, 1961-1963 inclusive.

LBJ (1963): awarded one five-year term, 1964-1968 inclusive.

Nixon2 (1974): awarded two years, 1973-1974.

Ford (1974): awarded two years, 1975-1976. Assumed the vice-presidency from the position of House minority leader in Dec 1973, after Vice President Spiro Agnew's resignation. Ford served only eight months as VP, during which time he mostly stumped for the Republican party and Nixon's 1974 re-election campaign, and occasionally acted as lobbyist for Nixon's legislation on Capitol Hill.

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[21] Rutkow, Ira. 2006. *James A. Garfield*. New York: Times Books, Henry Holt & Co. p. 121-122
[22] Greenberg, David. 2006. *Calvin Coolidge*. New York: Time Books.

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