The Effect, Historically, of the Party of the President on the US Economy

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- A simple analysis of historic data was done to see if there was a correlation between the performance of the US economy and the party of the president in office, Republican versus Democrat
- No effort was made to seek a correlation with any other variable, such as composition of the congress, national or international events, particular policies (economic or otherwise), etc.
- The historical interval used was the Kennedy administration through the Obama administration,
 - ▶ 1962 2017
 - ▶ 14 Presidential Terms, 56 years
 - Equal numbers of presidencies and years in office for each party (fortuitously) giving each party equal opportunity to affect the economy by their presidents bggibbard@gmail.com

Economic Indicators

Indicators studied

- Per Capita Gross Domestic Product
- Federal Debt as a Fraction of Gross Domestic Product
- Unemployment Rate
- ► S&P 500 Index
- Mean Household Income for:
 - ▶ Middle 20% of Households
 - Lowest 20% of Households
 - ► Top 5% of Households

These are among the more commonly referenced indicators

They are available from authoritative sources (primarily government)

Methodology

- Obtain tables for each indicator by (fiscal) year
 - Attribute fiscal years to president who started them. Fiscal years do not align with start and end of presidential terms (terms currently begin 1/3 of way through a fiscal year)
- Correct dollar values for inflation, when not already so corrected
- Parameterize each indicator as a fractional change from the preceding year
 - For example, the GDP at the end of a fiscal year is a certain fraction (per cent) higher (or lower) than at the end of the preceding fiscal year
 - The initial reference year is FY 1961 from which the first multiplier gives the value at the end of FY 1962 (the first Kennedy year)
 - Applying the multipliers one after the other for each year, one gets to the last multiplier which produces the value at the end of FY 2017 (the last Obama year)

Methodology (continued)

Why use fractional change rather than the amount of year to year change?

- Over historical range, 56 years, some indicators increased by factors of 2-4 (even inflation corrected), GDP for example
- \$1 trillion is more significant to a \$5 trillion GDP (1960's) than \$2 trillion is to a \$20 trillion GDP (today) (20% increase versus 10%) but it is a smaller amount
- For Household Income data, Census Bureau data were not available back to 1961 so a more limited range was used
 - Carter presidency through Obama presidency
 - ▶ 1977-2017, 40 years, 10 presidential terms
 - ▶ 5 terms and 20 years for each party's presidents

Methodology (continued)

- The comparison between the parties' presidencies had four aspects, four somewhat different ways of looking at the data
 - 1. Compare the average annual increase (or decrease) of each indicator for one party to that average for the other party
 - 2. Compare the average evolution of each indicator during each full presidency of one party to that average for each full presidency of the other
 - 3. Compare the total evolution of each indicator over the entire span of the study for each party in the absence of contributions from the other party
 - 4. Attempt to obtain an estimate (or at least a sense) of the statistical significance of any observed trend

Per Capita Gross Domestic Product

- Used Per Capita GDP rather than GDP to remove effect of simple growth in US population over 56 years
 - 184 million in 1961 versus 326 million in 2017 (77% growth)
- Average annual fractional growth in inflation corrected (PC)GPD
 - ► All 56 years 0.0200 (2.00%)
 - ► GOP years 0.0162 (1.62%)
 - ▶ Dem years 0.0241 (2.41%)
- Following graphs show fractional growth in (PC)GDP over the course of each presidency plus averages for each party's presidents

Bureau of Economic Analysis / "Real" Gross Domestic Product Ref: www.bea.gov

Per Cent Increase by "Year Into Presidency" of Per Capita GDP For Democrat Presidents

8



Per Cent Increase by "Year Into Presidency" of Per Capita GDP For Republican Presidents

9



Per Cent Increase by "Year Into Presidency" of Per Capita GDP For Average of Republican and Democrat Presidents

10



Per Capita Gross Domestic Product¹¹

- While the above plots show economic behavior during individual presidencies, the following plot shows, in black, the overall evolution of the US (PC)GDP in 2017 \$'s over 56 years ending with 2017
- The background shading of the plot is light red for the FY's of Republican presidents and light blue for FY's of Democrat presidents
- Also shown in the plot are what the contributions made by each party's presidents would have been in the absence of the other party's presidents' contributions
 - Red for the Republican contribution
 - Blue for the Democrat contribution



(PC)GDP Observations

- Note that since a multiplicative parameterization is used, each party's contribution builds on the other's so the total changes of each separately do not add up to the actual overall change
- The above plots indicate that the (PC)GDP rose by a factor of 3 over the 56-year period with a greater increase during Democrat administrations than during Republican
 - The average growth during individual Democrat presidency rising more steeply than that of Republican presidency
 - The cumulative effect over the entire 56-year period of the Democrat presidencies in the absence of Republican contributions is measurably more than that of Republican presidencies in the absence of Democrat contributions
- This is summarized in the next table

Per Capita Gross Domestic Product¹⁴ (Inflation Adjusted)

	Average Annual Fractional Increase	Total Change
Combined	0.0200 (2.00%)	\$40,100
Republican Only	0.0162 (1.62%)	\$11,000
Democrat Only	0.0241 (2.41%)	\$18,700

Methodology (Revisited)

Plots and tables like the preceding will be generated for other economic indicators

Trends across indicators will be sought

At the end, there will be an attempt to estimate the statistical significance of any observed trends

Federal Debt as Fraction of GDP

Debt significance scales with size of economy, GDP, so described as fraction of GDP

16

- Inflation corrected GDP has increased a factor of 3 over 56 years
- ▶ Debt as fraction of GDP increased $53\% \rightarrow 105\%$ over this period
- Implies inflation corrected debt actually rose by a factor of 6
- Average annual fractional growth in Federal Debt as fraction of GDP
 - All 56 years 0.0136 (1.36%)
 - ► GOP years 0.0394 (3.94%)
 - ► Dem years -0.0122 (-1.22%)
- Following graphs show fractional growth in Federal Debt (as fraction of GDP) over the course of each presidency plus averages for each party's presidents

Per Cent Increase by "Year Into Presidency" For Democrat Presidents of Total Federal Debt as Fraction of GDP

17 70% 50% 30% 10% -10% ----Kennedy/Johnson ---Carter ----Clinton -30% ---Obama Average -50% 2 3 5 0 4 6 7 8

Per Cent Increase by "Year Into Presidency" For Republican Presidents of Total Federal Debt as Fraction of GDP

18



Per Cent Increase by "Year Into Presidency" of Total Federal Debt as Fraction of Gross GDP for Average of Republican and Democrat Presidents



Years Into Presidency

19

Federal Debt as Fraction of GDP

20

While the above plots show economic behavior during individual presidencies, the following plot shows, in black, the overall evolution of the Federal Debt as Fraction of GDP over 56 years ending with 2017

- The background shading of the plot is light red for FY's of Republican presidents and light blue for FY's of Democrat presidents
- Also shown in the plot are what the contributions made by each party's presidents would have been in absence of the other party's presidents' contributions
 - Red for the Republican contribution
 - Blue for the Democrat contribution



% of GDP

Fiscal Year

Federal Debt Observations

- Not all agree about the importance of the Federal Debt
 - Fiscal conservatives/Republicans generally say increased debt is bad
 - Progressives/Democrats generally say modest debt increase, in a good cause, is tolerable
- These plots indicate that, on average, Democrat presidents have presided over modest decreases in the Federal debt while Republican presidents have presided over substantial increases in that debt
 - Contrary to professed positions

► This is reflected in

- The slightly decreasing changes on average during individual Democrat presidencies versus increasing changes on average over the course of individual Republican presidencies
- Looking at the cumulative effect over the entire 56-year period, for Democrat presidencies in the absence of Republican presidencies, there would have been a decrease in the debt while for Republican in the absence of Democrat, the debt would have been significantly larger
- This is summarized in the next table



Federal Debt as Fraction of GDP

	Average Annual Fractional Increase	Total Change
Combined	0.0136 (1.36%)	+52.0%
Republican Only	0.0394 (3.94%)	+98.8%
Democrat Only	-0.0122 (-1.22%)	-16.4%

Unemployment Rate

- The unemployment rate is one of the most widely watched indicators of economic performance
- Unlike others it is not generally increasing with time but has swung up and down over the last 56 years with a mean value around 6%
- Talking of fractional changes in the unemployment rate is somewhat confusing since it is usually quoted as a per cent which is itself a fraction of total employment
 - When the unemployment rate goes from 5% down to 4% that is a -0.20 fractional change in the unemployment rate, it is not a -0.01 fractional change (that would be the fractional change of the total employment)

24

- Average annual fractional growth in the unemployment rate
 - ► All 56 years 0.0047
 - ► GOP years 0.0600
 - Dem years -0.0505
- The following plots show the fractional increase in unemployment over the course of each presidency plus the increase over the average presidency of each party

Bureau of Labor Statistics / Unemployment Rate <u>Ref: https://data.bls.gov</u>

Fractional Increase by "Year Into Presidency" of Unemployment Rate For Democrat Presidents



Fractional Increase by "Year Into Presidency" of Unemployment Rate For Republican Presidents

Unemployment Rate

28

While the above plots show economic behavior during individual presidencies the following plot shows, in black, the overall evolution of unemployment over 56 years ending with 2017

- The background shading of the plot is again light red for FY's of Republican presidents and light blue for FY's of Democrat presidents
- Also shown in the plot are what the contributions made by each party's presidents would have been in absence of the other party's presidents' contributions
 - Red for the Republican contribution
 - Blue for the Democrat contribution

Fiscal Year

Unemployment Rate Observations

These plots indicate that, during all Democrat presidencies except Carter's, the unemployment rate decreased significantly while for all Republican presidencies, except Reagan's, the unemployment rate increased, almost as significantly 30

While perhaps not realistic, it is interesting to note in the 56-year cumulative plot that:

- Had the Republican presidencies immediately followed each other, without the intervening Democrat presidencies, these fractional changes would have produced an unemployment rate in excess of 20%, like that of the Great Depression
- Similarly, uninterrupted Democrat presidencies would have produced an unemployment rate below 2%

These observations are summarized in the table below

Unemployment Rate

	Average Annual Fractional Increase	Total Change
Combined	0.0047	-2.50%
Republican Only	0.0600	+14.58%
Democrat Only	-0.0505	-5.38%

Inflation Adjusted S&P 500

- The S&P 500 index, a general, widely quoted measure of the performance of the stock market is important to ...
 - those of significant wealth directly invested in the stock market
 - those with 401k retirement plans invested in the stock market
 - those with union or corporate retirement plans so invested
- Average annual fractional growth in the inflation adjusted S&P 500
 - All 56 years 0.0418 (4.18%)
 - ► GOP years 0.0241 (2.41%)
 - Dem years 0.0594 (4.94%)
- The following plots show fractional growth in the S&P 500 index over the course of each presidency plus averages for each party's presidents

Per Cent Increase by Year Into Presidency of S&P 500 33 For Democrat Presidents 160% ----Kennedy/Johnson 140% ---Carter 120% ----Clinton 100% ---Obama 80% Average 60% 40% 20% 0% -20% -40% 2 3 5 6 0 4 7 8

Per Cent Increase by Year Into Presidency of S&P 500 For Republican Presidents

Per Cent Increase by Year Into Presidency of S&P 500 For Average of Republican and Democrat Presidents

Years Into Presidency

35

Inflation Adjusted S&P 500

- While the above plots show economic behavior during individual presidencies the following plot shows, in black, the overall evolution of the S&P 500 over 56 years ending with 2017
- The background shading of the plot is again light red for the FY's of Republican presidents and light blue for FY's of Democrat presidents
- Also shown in the plot are what the contributions made by each party's presidents would have been in absence of the other party's presidents' contributions
 - Red for the Republican contribution
 - Blue for the Democrat contribution

S&P 500 Growth Observations

These plots indicate that Democrat presidents have presided over very substantial increases in the S&P 500 while Republican presidents have presided over rather modest increases 38

► This is reflected in

- The much steeper average rise during individual Democrat presidencies relative to the average rise during individual Republican presidencies
- Looking at the cumulative effect over the entire 56-year period, for Democrat presidencies in the absence of Republican presidencies, there would have been a more than ten times greater gain than that under Republican presidencies in the absence of Democrat presidencies.
- This is summarized in the next table

39

Inflation Adjusted S&P 500 Index

	Average Annual Fractional Increase	Total Change			
Combined	0.0418 (4.18%)	\$ 2,041 (357%)			
Republican Only	0.0241 (2.41%)	\$ 116 (20%)			
Democrat Only	0.0594 (5.94%)	\$ 1,602 (280%)			

Inflation Adjusted Mean Household Income

40

- The mean household income is the ultimate measure of the success or failure of the economy for most people
- The data used for this comes from the Census Bureau and is limited to the 40 years from 1977 to 2017, again a period of equality opportunity for the two parties' presidencies
- The Census data is binned into fifths of the income range (20% each) plus an additional overlapping bin for the top 5% of earners
- I chose to work with the middle 20% bin, the lowest 20% bin, and the top 5% bin

Per Cent Increase by "Year Into Presidency" of Mean Household Income of Middle 20% for Democrat Presidents

41

Per Cent Increase by "Year Into Presidency" of Mean Household Income of Middle 20% for Republican Presidents

Per Cent Increase by "Year Into Presidency" of Mean Household Income of Middle 20% for Average of Republican and Average of Democrat Presidents

Inflation Adjusted Mean Income for the Middle 20% (1/5th)

While the above plots show household income growth during individual presidencies, the following plot shows, in black, the overall evolution of household income over 40 years ending with 2017

As Before

- The background shading of the plot is again light red for FY's of Republican presidents and light blue for FY's of Democrat presidents
- Also shown in the plot are what the contributions made by each party's presidents would have been in absence of the other party's presidents' contributions
 - ► Red for the Republican contribution
 - Blue for the Democrat contribution

Fiscal Year

Mean Household Income for Middle 20%

These plots indicate that Democrat presidents have presided over most of the modest increase that has occurred in the household income of the middle 20% over the past 40 years

► This is reflected in

The steeper average rise during individual Democrat presidencies relative to the average rise during individual Republican presidencies 46

- Looking at the cumulative effect over the entire 40-year period, for Democrat presidencies in the absence of Republican presidencies, there would have been a more than ten times greater gain than that under Republican presidencies in the absence of Democrat presidencies
- This is summarized in the next table

Inflation Adjusted Mean Household Income for Middle 20%

	Average Annual Fractional Increase	Total 40 Year Increase		
Combined	0.0053 (0.53%)	\$11,388 (23%)		
Republican Only	0.0011 (0.11%)	\$ 961 (2%)		
Democrat Only	0.0096 (0.96%)	\$ 10,231 (20%)		

Per Cent Increase by "Year Into Presidency" of Mean Household Income of Lowest 20% for Democrat Presidents

Per Cent Increase by "Year Into Presidency" of Mean Household Income of Lowest 20% for Republican Presidents

49

Per Cent Increase by "Year Into Presidency" of Mean Household Income of Lowest 20% for Average of Republican and Democrat Presidents

Years Into Presidency

50

Inflation Adjusted Mean Income For the Lowest 20% (1/5th)

51

While the above plots show household income growth during individual presidencies, the following plot shows, in black, the overall evolution of household income over 40 years ending with 2017

► As Before

- The background shading of the plot is again light red for FY's of Republican presidents and light blue for FY's of Democrat presidents
- Also shown in the plot are what the contributions made by each party's presidents would have been in absence of the other party's presidents' contributions
 - Red for the Republican contribution
 - Blue for the Democrat contribution

Mean Inflation Adjusted Household Income for Lowest 20% vs Fiscal Year

Mean Household Income for Lowest 20%

These plots indicate that Democrat presidents have presided over very modest increases in household income of the Lowest 20% over the past 40 years, while Republican presidents have presided over actual losses of income for this segment of our population

► This is reflected in

The steeper average rise during individual Democrat presidencies relative to the average rise during individual Republican presidencies

Looking at the cumulative effect over the entire 40-year period, for Democrat presidencies in the absence of Republican presidencies, there would have been a small but measurable gain, while looking at Republican presidencies in the absence of Democrat presidencies, there would have been a measurable loss

This is summarized in the next table

Inflation Adjusted Mean Household Income for Lowest 20%

54

	Average Annual Fractional Increase	σ	Total 40 Year Increase
Combined	0.0022 (0.22%)	2.76%	\$ 935 (8%)
Republican Only	-0.0013 (-0.13%)	2.20%	\$ -361 (-3%)
Democrat Only	0.0057 (0.57%)	3.24%	\$1,335 (11%)

30% ---Carter 25% ---Clinton 20% ----Obama 15% Average 10% 5% 0% -5% -10% 2 3 5 6 8 0 4 7

Per Cent Increase by "Year Into Presidency" of Mean Household Income of Top 5% for Democrat Presidents

55

Per Cent Increase by "Year Into Presidency" of Mean Household Income of Top 5% for Republican Presidents

Per Cent Increase by "Year Into Presidency" of Mean Household Income of Top 5% for Average of Republican and Average of Democrat Presidents

57

Inflation Adjusted Mean Income for the Top 5%

While the above plots show household income growth during individual presidencies, the following plot shows, in black, the overall evolution of household income over 40 years ending with 2017

As Before

- The background shading of the plot is again light red for FY's of Republican presidents and light blue for FY's of Democrat presidents
- Also shown in the plot are what the contributions made by each party's presidents would have been in absence of the other party's presidents' contributions
 - ► Red for the Republican contribution
 - Blue for the Democrat contribution

Mean Inflation Adjusted Household Income for Top 5% vs Fiscal Year

59

Mean Household Income for Top 5%

60

This is reflected in

- The highly intertwined rising growth rates of the average presidencies of the two parties
- In the cumulative effect over the entire 40-year period, each party would, in the absence of the other, have produced nearly equal, substantial income increases for the Top 5%
- This is summarized in the next table

Inflation Adjusted Mean Household Income for Top 5%

	Average Annual Fractional Increase	Total 40 Year Increase
Combined	0.0173 (1.73%)	\$184,735 (92%)
Republican Only	0.0181 (1.81%)	\$ 79,621 (40%)
Democrat Only	0.0165 (1.65%)	\$ 75,242 (38%)

61

Summary: Overall Trends

- For 6 of the 7 indicators, Democrat presidents have, on average, presided over significantly better performance than Republican presidents, as discussed below, with the 7th a virtual dead heat
- First, measured average growth rates for Democrats are larger where larger is good

62

- Gross Domestic Product, S&P 500 Index, and Incomes
- ... and smaller where larger is bad
 - Debt and Unemployment
- In the following summarizing table, also shown is the standard deviations, σ, for each average annual increase
- These were used to obtain a sense of the statistical significance of the better democrat performance for each indicator which are then shown in the final column of the table
- Except for "Income of the Top 5 %", the individual significances range from highly to modestly significant and taken as whole leave no doubt that the economic outperformance of Republican by Democrat presidents is statistically very significant

Average Annual Change In Economic Indicators For Republican versus Democrat Presidential Years

(Fractional Change in the Indicator Expressed as a Per Cent of that Indicator)

			Combined		GOP		DEM		Probability of Such a
	Economic Indicator	Fiscal Year	Average Annual		Average Annual		Average Annual		Result Solely by
		Range	% Increase	σ	% Increase	σ	% Increase	σ	Statistical Fluctuation
1	Per Capita Gross Domestic Product (Inflation corrected)	1961-2017	2.00%	2.02%	1.62%	2.39%	2.41%	1.55%	~1 chance in 14
2	Federal Debt as % of GDP (%'s change in per cent of GDP))	1961-2017	1.36%	4.83%	3.94%	5.45%	-1.22%	4.23%	~1 chance in 8500
3	Unemployment Rate (%'s change in per cent unemployment)	1961-2017	0.47%	1 7.48 %	6.00%	20.80%	-5.05%	11.27%	~1 chance in 110
4	S&P 500 (Inflation Corrected)	1961-2017	4.18%	16.20%	2.41%	17.70%	5.94%	14.88%	~1 chance in 5
5	Income: Middle 20% of Population (Mean Household, Inflation Adjusted)	1977-2017	0.53%	2.04%	0.11%	1.68%	0.96%	2.21%	~1 chance in 11
6	Income: Lowest 20% of Population (Mean Household, Inflation Adjusted)	1977-2017	0.22%	2.76%	-0.13%	2.20%	0.57%	3.24%	~1 chance in 5
7	Income: Top 5% of Population (Mean Household, Inflation Adjusted)	1977-2017	1.73%	4.52%	1.81%	5.20%	1.65%	3.00%	~1 chance in 2

Overall Trends (continued)

Second, looking at the evolution of these indicator during the typically 8 years of individual presidencies

- The average Democrat evolution is much better than the Republican average for all indices, except for "Top 5% Household Incomes" which was a dead heat
- Third, as measured by separating, by party, the contribution to overall indices evolution during the entire span of the study
 - Past 56 years for most indices but 40 years for household incomes
 - As summarized in the next table, Democrats outperform Republicans by a "very large" to "significant" margin, again except for "Top 5% Household Incomes" where Republicans do slightly better (2%) than a dead heat
 - Remembering that for Debt and Unemployment decreases (negatives) are better

Total Economic Indicator Evolution by Party of President

			Combined	Republican	Democrat	Per Cent
Economic		Starting	(Actual)	only	only	Democrat
Indicator	Period	Value	Ending Value	Ending Value	Ending Value	Advantage
Per Capita GDP (2017 \$'s)	1961-2017	\$19,833	\$59 <i>,</i> 977	\$30,845	\$38,564	39%
Federal Debt as % of GDP	1961-2017	53%	105%	152%	37%	-115%
Unemployment Rate (%)	1961-2017	6.7%	4.2%	21.3%	1.3%	-20%
S&P 500 (2017 \$'s)	1961-2017	\$571	\$2,613	\$687	\$2,173	260%
Household Income Mid 20%	1977-2017	\$50,176	\$61,564	\$51,137	\$60,407	18%
Household Income Low 20%	1977-2017	\$12,323	\$13,258	\$11,962	\$13,658	14%
Household Income Top 5%	1977-2017	\$200,554	\$385,289	\$280,175	\$275,796	-2%

Conclusions

- Republicans have historically been thought to be champions of business and economic growth through free markets, deregulation, reducing taxes (especially graduated taxes), balancing the budget (controlling the deficit), limiting labor unions, limiting social programs which might discourage the work ethic, and generally conducting both domestic and foreign policy with an eye to benefit the economy
- Democrats have historically been thought to give higher priority to social issues than the economy, and so to have frequently compromised the optimization of the economy to social ends
- The preceding analysis of US economic evolution over the last half century, without attributing it to any particular policies, shows that Republican presidents have failed, dramatically, to deliver economic growth and well being nearly as effectively as the "less business-oriented" Democrat presidents

Conclusions (My Takeaway)

- There are various reasons for voting for a particular party's presidents...
- ... abortion rights, gun control, immigration, diversity, the environment, traditional values, US role in the world, etc. of which many are hard to evaluate in other than subjective terms, but ...
- ... economic reasons, commonly cited as a reason to vote for a Republican president, are objectively refuted by the past 50 years of history, as shown in the preceding
- If economic theories are currently not capable of convincingly predicting the outcomes of various policies ...

... it is more logical to choose what has been empirically observed to work over the past half century and vote for Democrat presidents

And What About Trump

- In the context of this study, how is he doing?
- ► The data set available for Trump:
 - ▶ % increase for one year, FY 2018, for each economic indicator...
 - ... except no data yet available for the 3 household incomes
- Remember that the preceding study extended over 56 years, 28 for each party, so we can not expect anything very conclusive
- The following slide shows a histogram of the factional annual increase of each indicator with this one year of Trump presidency in among the 28 years of Democrat and the 28 years of other Republican presidencies

Fractional Increase in Unemployment Rate

■Dem ■GOP ■Trump

And What About Trump (continued)

- ► A single year has little statistical significance and ...
- In this one point, appearing in grey on those histograms, falls in the most populated bin for each indicator
- Therefore, to the extent that one can conclude anything, based on this single year, he has been neither especially good nor especially bad for the economy
- He inherited a very good economy and, so far, with very limited statistics, all we can say from this analysis is that he...
 - ... has not screwed it up, at least yet
 - ... has incrementally improved it, much as, on average, most presidents have done
- We will have to wait to see
 - ... but he is a Republican so we might be able to guess, based on the preceding, what is most likely to ultimately happen