

The Growth of the United States Economy:  
Republican Presidents vs Democratic Presidents



## **Introduction**

Two of the ways to look at the growth of the United States economy is to look at the change in GDP and the change in the unemployment rate. The GDP stands for gross domestic product, which is the monetary value of the goods and services produced during a specified time period. The unemployment rate is the measure of the number of people who are not currently employed but are available and seeking work. Throughout history the GDP and unemployment have constantly fluctuated, but some presidents have had more successes in steering these numbers in the right direction. The question that this project addresses is: Do republican presidents, or democratic presidents, do better at causing positive changes to these measurements of the economy?

## **Data**

The data collected for this project was found on multiple websites and spans across all of the presidents since the platform switch between the democrats and republicans. The first set of data is a comparison of the average annual growth rate of the GDP for each president. This data is shown in Table 1 below. The second set of data is a comparison of the average annual job growth rate. This data is shown below in Table 2. The data in Table 1 shows that John F. Kennedy had the highest growth rate of the GDP at 5.3%, and George W. Bush had the lowest growth rate of the GDP at 1.6%. The average growth rate of the GDP for democratic presidents was 3.9% and the average for republican presidents was 2.5%.

Table 1: Average Annual Growth Rate of Real GDP

<b>President</b>	<b>Average Annual Growth Rate of real GDP</b>
Barack Obama	2.0 % (as of May 2016)
George W. Bush	1.6 %
Bill Clinton	3.7 %
George H.W. Bush	2.0 %
Ronald Reagan	3.4 %
Jimmy Carter	3.4 %
Richard Nixon/Gerald Ford	2.7 %
John F. Kennedy/Lyndon B. Johnson	5.3 %
Dwight D. Eisenhower	2.4 %
Harry Truman	4.9 %

The data in Table 2 shows that Jimmy Carter had the highest job growth rate at 3.3% and George W. Bush had the lowest rate at -0.04%. The average job growth rate for democratic presidents was 2.5% and the average rate for republican presidents was 1.0%. In Table 1 and Table 2, presidents that are democrats are highlighted in blue and the presidents that are republicans are highlighted in red.

Table 2: Average Annual Growth Rate of Private-Sector Payrolls

<b>President</b>	<b>Average Annual Growth Rate of Private-Sector Payrolls</b>
Barack Obama	1.2 % (as of May 2016)
George W. Bush	- 0.04 %
Bill Clinton	2.6 %
George H.W. Bush	0.4 %
Ronald Reagan	2.3 %
Jimmy Carter	3.3 %
Richard Nixon/Gerald Ford	1.7 %
John F. Kennedy/Lyndon B. Johnson	3.0 %
Dwight D. Eisenhower	0.5 %
Harry Truman	2.7 %

Tables 3 and 4 display that summary statistics for the data in Tables 1 and 2 respectively. The distribution is normal for Table 1 because the mean and median are very close together for each type of president, but the distribution of the data in Table 2 is only normal for the democratic presidents. The mean and median for the republican presidents in Table 2 are much farther apart and therefore the data is skewed right. This is shown by the mean being twice as large as the median.

Table 3: Summary Statistics: Average Annual Growth Rate of Real GDP

	Mean	Standard Deviation	Median
Democratic Presidents	3.86 %	0.013088163	3.70 %
Republican Presidents	2.42 %	0.006870226	2.40 %

Table 4: Summary Statistics: Average Annual Growth Rate of Private-Sector Payrolls

	Mean	Standard Deviation	Median
Democratic Presidents	2.56 %	0.008080842	2.70 %
Republican Presidents	0.97 %	0.009833209	0.50 %

Figure 1 displays the information from Table 1 in a bar graph. Figure 2 displays the data from Table 2 in a bar graph.

Figure 1: Bar Graph of Average Annual Growth Rate of Real GDP

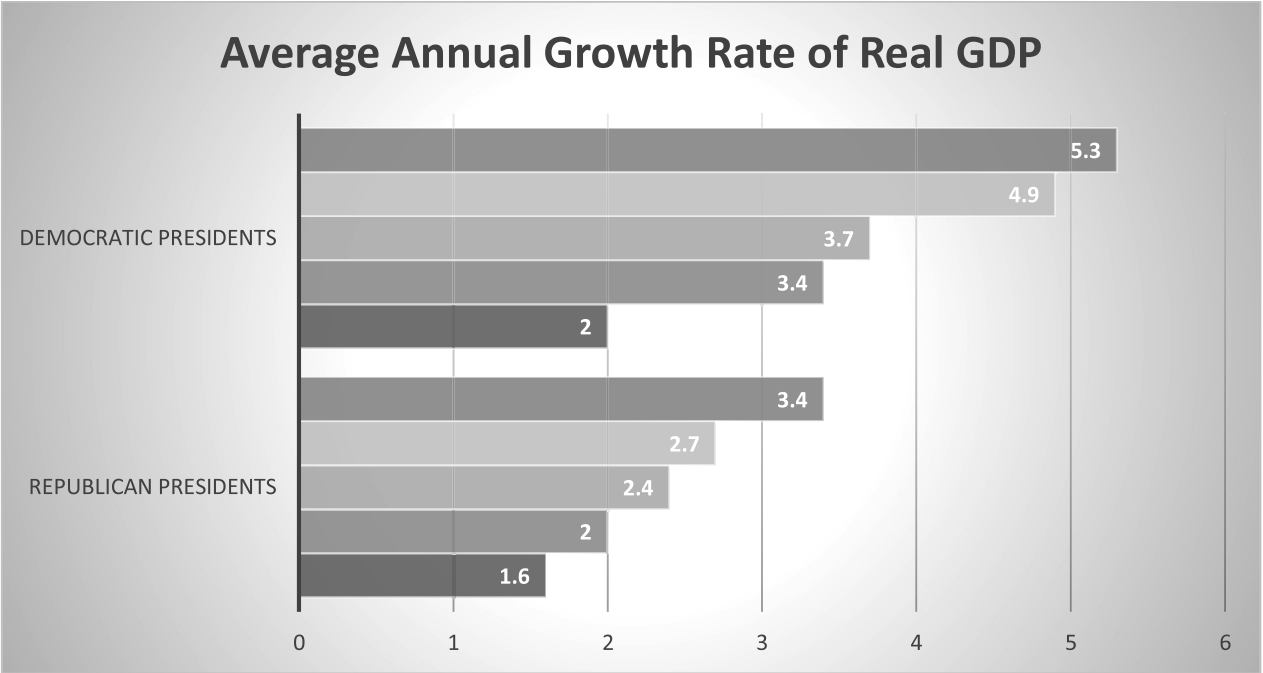
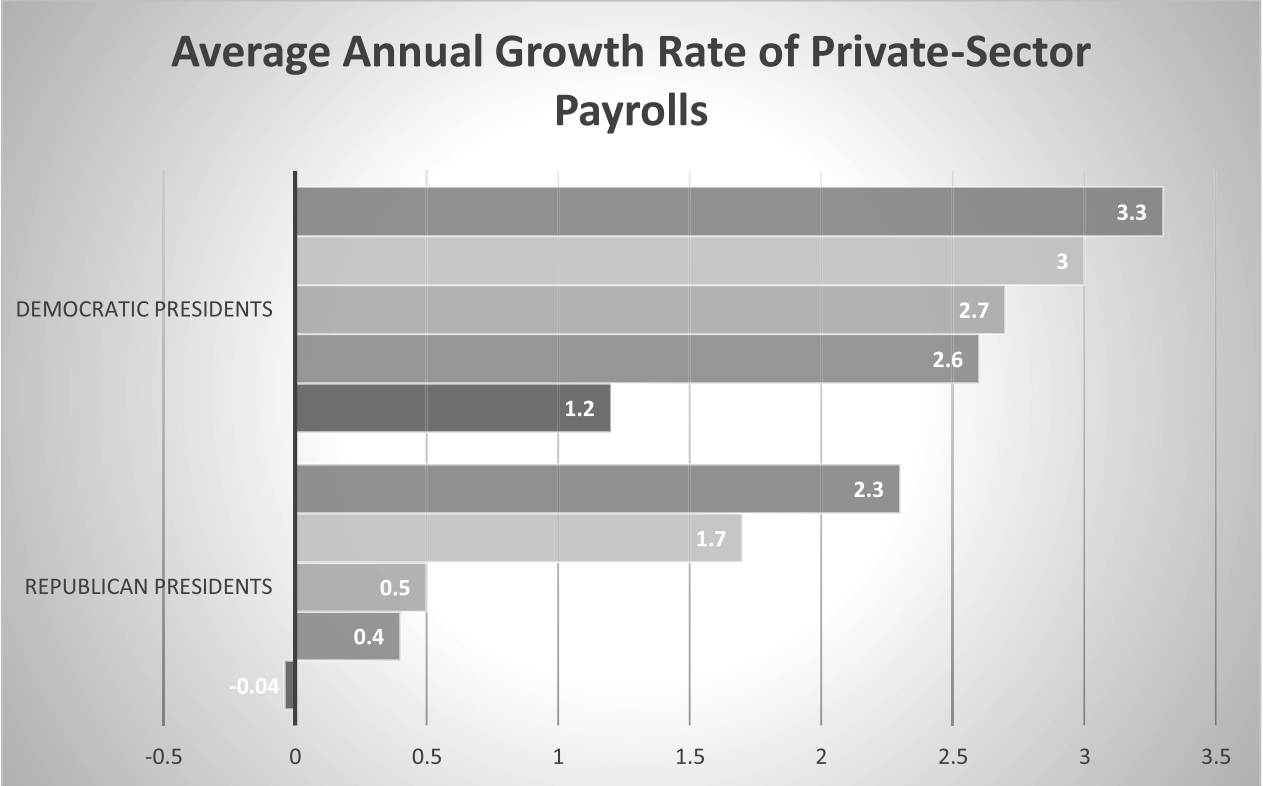


Figure 2: Bar Graph of Average Annual Growth Rate of Private-Sector Payrolls



## Hypothesis Test

The hypothesis is to test if the average annual growth rate of real GDP of democratic presidents is greater than or equal to the average annual growth rate of real GDP of republican presidents, and if the average annual growth rate of private-sector payrolls for democratic presidents is greater than or equal to the average annual growth rate of private-sector payrolls for republican presidents. All of the data gathered suggests that the democratic presidents have higher averages in both sections. The null hypothesis for the average annual growth rate of real GDP is  $H_0 : \mu = 2.42$  and the alternate hypothesis is  $H_a : \mu > 2.42$ . The null hypothesis for the average annual growth rate of private-sector payrolls is  $H_0 : \mu = 0.97$  and the alternate hypothesis is  $H_a : \mu > 0.97$ . The corresponding test statistic is t-test:

Average annual growth rate of real GDP:

$$t = \frac{\bar{X} - \mu}{\frac{s}{\sqrt{n}}} = 246.02$$

Average annual growth rate of private-sector payrolls:

$$t = \frac{\bar{X} - \mu}{\frac{s}{\sqrt{n}}} = 439.97$$

For these equations,  $\bar{X}$  is the sample mean,  $s$  is the standard deviation, and  $n$  is the number of samples. When the significance level is set at 0.10, the critical value is 1.533. Since  $246.02 > 1.533$ , the null hypothesis is rejected, and since  $439.97 > 0.97$ , the null hypothesis is rejected.

## Conclusion

Do republican presidents, or democratic presidents, do better at causing positive changes to these measurements of the economy? The data collected shows that the democratic presidents have a higher percentage increase in the average annual growth rate of real GDP, and a higher percentage increase in average annual growth rate of private-sector payrolls.

## References

- [1] United States Joint Economic Committee. "The Economy Under Democratic vs. Republican Presidents." *Reports - United States Joint Economic Committee*, 22 June 2016, [www.jec.senate.gov/public/index.cfm/democrats/2016/6/the-economy-under-democratic-vs-republican-presidents](http://www.jec.senate.gov/public/index.cfm/democrats/2016/6/the-economy-under-democratic-vs-republican-presidents).