

Article

Does the Misery Index Influence a U.S. President's Political Re-Election Prospects?

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Abstract: We seek to determine whether a United States President's job approval rating is influenced by the Misery Index. This hypothesis is examined in two ways. First, we employ a nonlinear model that includes several macroeconomic variables: the current account deficit, exchange rate, unemployment, inflation, and mortgage rates. Second, we employ probit and logit regression models to calculate the probabilities of U.S. Presidents' approval ratings to the Misery Index. The results suggest that Layton's model does not perform well when adopted for the United States. Conversely, the probit and logit regression analysis suggests that the Misery Index significantly impacts the probability of the approval of U.S. Presidents' performances.

Keywords: Misery Index; inflation; unemployment; Probit and Logit models; Okun's law

JEL Classification: C13; C30; E32; E66

1. Introduction

"It's the economy, stupid", a statement famously coined by James Carville, campaign strategist to presidential candidate Bill Clinton's 1992 U.S. election campaign team, claimed that electoral success hinged on the performance of the United States economy. Are U.S. citizens better off now than 4 years ago? Is it relatively easier to find a job now than four years ago? Typically, questions of this nature resonate in the minds of constituents and political representatives that are seeking to run for public office. However, the performance of the economy in relation to the success, or otherwise, of the election or re-election of political representatives and or political parties is not new. The core "Misery Index", devised by Arthur Okun, who served as presidential advisor to United States President Lyndon B. Johnson's Council of Economic Advisers, is the sum of the inflation and unemployment rates, which was used as a core measure of economic discomfort. The Misery Index was used by policymakers and politicians as an "objective" measure of well-being. An accurate and objective measure of the "peoples" discomfort is typically perceived to influence politicians' likelihood of electoral success.

The objective of this paper is to determine whether U.S. Presidents' job approval ratings are influenced by the rates of inflation and unemployment—the Misery Index. Does the economy matter? Are the political fortunes of U.S. Presidents determined by changes in the components of the Misery Index? We are motivated to undertake this research for several reasons. First, it is of important policy interest to determine whether increases (or decreases) in unemployment and inflation rates decrease (or increase) the likelihood of electoral success of U.S. Presidents. Second, the period January 1973 through to November 2015, including the second term of the Obama administration, represents several significant economic and political events; the period of stagflation in the 1970s, world-wide recessions of 1981–1982, 1990–1991, the Iraq War, the 1997 Asian Financial Crisis, sub-prime crisis, and the

Global Financial Crisis (GFC). Third, [Layton \(1992\)](#) estimated the degree that Australia's community welfare was affected by a number of macroeconomic variables that included unemployment, inflation rate, current account deficit, and the exchange rate. We extend this novel study by exploring the non-stationary properties of U.S. data and seek to determine whether the model adopted by [Layton \(1992\)](#) is robust to non-stationary tests and analysis. Fourth, we are not aware of any US study that has estimated the probability of electoral success of U.S. Presidents (as measured by their job approval rating) based on the Misery Index or its components and a set of "standard" macroeconomic variables using probit analysis. Fifth, it would be of policy interest to determine whether the impact of real economic variables matter to U.S. Presidents' approval ratings or is simply illusory and based upon perceptions, or non-economic factors. In particular, monitoring and managing the two components of the misery index, i.e., unemployment and inflation rates, are the congressional mandates of the Federal Reserve Bank.

This paper is organized in the following sections. Section 2 provides a review of the literature on the Misery Index. Section 3 describes the data and methodology employed in this paper. Section 4 reports the empirical findings. Section 5 is devoted to a short discussion of findings. Section 6 provides a summary of our findings.

2. Literature Review

The movement in the Misery Index, the sum of the levels of unemployment and inflation, has been used to monitor the movements in the level of macroeconomic welfare of a community. A decreasing (or increasing) value in the Misery Index is expected to improve (or deteriorate) well-being. In one paper, [Layton \(1992\)](#) employed a set of macroeconomic variables, namely, current account deficit, real wages, inflation, unemployment rate, rate of exchange rate between the Australian and US dollar (\$US/\$A), and an election dummy to examine the approval rating of the Prime Minister of Australia (dependent variable).

Many papers in the late 1970s addressed the relationship between the economy and the approval rate of U.S. presidents or votes they receive. [Mueller \(1970, 1973\)](#) led this line of research with his seminal work using Gallup aggregate approval ratings as the dependent variable in a number of regressions. His findings showed an asymmetric association between the state of the economy and presidential approval ratings. Specifically, the recessionary state of the economy was associated with declining presidential popularity, while positive economic trends did not show such association.

Other scholars explored the subject further. [Kenski \(1977, 1980\)](#), [Fair \(1978, 1982, 1988\)](#), and [Rogoff and Sibert \(1988\)](#), among others, are notable. The problem with many of these papers is that they relied on regression models that generally ignored the nonstationary time series. [Ostrom and Smith \(1992\)](#) are perhaps the first researchers that raised concerns about regression results regarding approval rates in the presence of nonstationary time series. It is well known that regression estimates in the presence of non-stationary variables produce spurious results.

Perhaps due to econometric issues, research prior to the mid-1990s failed to produce any consistent empirical verdict on the matter. Thus, even after decades since the first paper on the presidential approval rate, there is no clear consensus regarding the role of economic variables in the presidential approval rate. The literature tends to accept that the stance of the economy influences the popularity of the incumbent president. For example, [Norpoth \(1984, p. 266\)](#) states: "There can be little doubt that the economy matters for presidential popularity."

Researchers in recent years have examined the association of the misery index with several socioeconomic variables. For instance, [Lorde et al. \(2016\)](#), [Nunley et al. \(2011\)](#), [Tang and Lean \(2009\)](#), among others, studied the association of the crime rate and the misery index.

Given the econometric problems that beset most academic papers prior to 1990s, we focus our attention on papers that explore the association of the economy and the presidential performance approval in the post-1990 years.

Lean and Smyth (2011) show that the impact of positive aggregate demand shocks on misery index are temporary. Their findings would cast doubt that misery index and the presidential approval rate are associated over time.

Lovell and Tien (2000) investigate the association of the misery index with consumer confidence. Their findings indicate that there is a linear relationship between the two indices. Furthermore, they provide evidence that the frequency of the data may matter. For instance, the misery index that is the sum of annual rates of inflation and unemployment rate may be more useful in gauging consumer confidence. The unemployment rate is statistically significant in a comprehensive model of the relationship between the consumer sentiment and economic variables, while inflation rate is not.

Berlemann and Enkelmann (2014) offer an extensive survey of papers investigating the subject of the economy and presidential approval rate. They conclude that functional forms of equations that relate approval rate to economic variables, methods of estimation, presence of unit root in some time series, and the period of study, might have contributed to contradictory findings. However, they identify the inflation and unemployment rates as well as the budget deficit as economic factors that have been shown to influence presidents' approval ratings.

Berlemann et al. (2015), estimate popularity functions for the United States using semi-parametric estimation and flexible functional form, allowing for the data to determine the appropriate functional form. They prefer a flexible formulation form to linear models employed in most studies. Their estimation results offer statistical support for interaction of economic variables and non-linearities in the relationship between economic variables and presidential popularity. Allowing for the variable of time in office corroborates the common finding that presidential approval rate often declines toward the end of term in the office.

Choi et al. (2016) confirm that the relationship between the economy and the presidential approval is nonlinear. They employ a novel approach by estimating a nonlinear threshold model over quarterly data spanning the first quarter of 1960 through the second quarter of 2012. Impulse response functions track the impact of the shocks (rises) in unemployment and inflation rates on the presidential approval rate. Their impulse response functions show that presidential approval rate improves as the unemployment rate falls during the high unemployment periods, which is defined as above 7 percent. However, the impulse response of the approval rate is asymmetric and disappears if the unemployment rate is below the threshold rate of 7 percent.

Impulse responses of the presidential approval rate to inflation shocks also vary across the low to high unemployment rate conditions. They show that in periods of low unemployment rate (<7%), higher inflation shocks improve the approval rate, while the opposite occurs during high unemployment, at least in the first quarter. Given their findings on inflation and consumer sentiment shocks, Chi et al. believe further research is warranted.

Dickerson (2016) examines the association between the presidential performance approval rate in both directions. His approach is novel, which allows for feedback from the presidential approval to economic performance. This approach is based on the notion that the electorate uses economic information to confirm their existing political beliefs. His findings confirm the above notion by showing a stronger effect of presidential approval rate on economic perceptions than the other way around. His simultaneous equation estimation results suggest that recessionary economic periods may result in strong negative impact on presidential approval rate.

Ferreira and Sakurai (2013) investigate the relative importance of economic conditions versus other factors in determining the presidential approval rate. Specifically, do citizens consider macroeconomic conditions more important than personal attributes and charisma in forming their opinions of a president's performance rating? The analysis of the monthly data on Brazilian presidents' approval rates from 1999 to 2010 show that the economic and political indicators explain the variations in the presidential approval ratings in Brazil. Specifically, the unemployment rate and the minimum wage rate are the most important economic variables considered by citizens.

Edwards et al. (1995) suggest that saliency of issues for citizens may be the cornerstone of their rating of a president's performance. Saliency of issues vary over time. For instance, while the Federal debt may take salience over other economic issues during some periods, the attention of the public may shift to inflation rate, and inflation may rise to salience for the public. Thus, depending on how a president performs in dealing with salient issues at the time, the presidential rating could respond accordingly. Edwards et al. (1995) analyze media coverage of issues. They estimate logit models of public opinion polls and time series regression of relationship between salient issues and their association with presidential approval. They confirm that the public perception of salient issues varies over time, and there is a direct relationship between issues of salience to the public and their approval rating of the presidential performance. The findings of Edwards et al. (1995) lend support to Berlemann and Enkelmann (2014), among others, who find that depending on the time period, presidential approval rate may respond to different economic variables.

The popular media continues to link the performance of a president to the economy. For instance, Langer (2018) suggests that the good economies do not necessarily make a president popular, and vice versa.

He considers the unemployment rate as a proxy for economic performance and identifies four tiers of unemployment rate from low to high rates. Tier 1 represents periods of unemployment of 4.5 percent or lower, generally considered full employment; Tier 2, 4.6 to 5.5 percent; Tier 3, 5.6 to 6.8 percent; and Tier 4, 6.9 percent unemployment or higher. Trump's presidency is currently enjoying unemployment rates below 4.5 percent, yet his approval rate is just 36-percent approval in the latest ABC News/Washington Post poll.

Langer (2018) provides correlation coefficient estimates. These estimates indicate that the correlation between unemployment rate and presidential approval rate is erratic, tenuous, and counterintuitive. He computes correlation coefficients between approval and unemployment for Gerald Ford (0.70), George H.W. Bush (0.71), Dwight Eisenhower (0.68), and Clinton (0.66), indicating that high unemployment rate was associated with high presidential approval rate. On the contrary, high employment rates were negatively associated with the approval of Truman (−0.65), Johnson (−0.90), John F. Kennedy (−0.49), and now Trump (−0.66). Kennedy, Jimmy Carter, Ronald Reagan, and Barack Obama all started with high approval despite higher than 6.9 percent unemployment. These findings would cast doubt on the relationship between the economy and the presidential approval rates. His conclusions are that a poor economy may make it difficult for a president to be popular. However, a better economy does not necessarily lead to popularity, though it may make it likely.

Cohn (2018) is another article in the popular media that discusses the association between presidential approval rate and the economy. He cites evidence that the stock market has surged. Unemployment is at 4.1 percent. ISIS has largely been vanquished from Iraq and Syria. However, Donald J. Trump's approval ratings are mired in the upper 30s. This is the lowest for any president at this stage of presidency since modern polling began more than three-quarters of a century ago. If the approval rating would be boosted by economic performance, Trump's approval rating should have been lifted into the 50s, based on the experience. Lyndon Johnson is the only other first-term president in the era of modern polling with an approval rating under 50 percent while the unemployment rate was below 5 percent.

The controversy regarding the relationship between the economy and the presidential approval rate is not resolved. Academic and popular research indicate that conclusions run the gamut from no to some relationship between the economy and the presidential approval rate. As Berlemann and Enkelmann (2014) and Choi et al. (2016) suggest, further research is in order. Given the importance of the unemployment and inflation rates, i.e., the components of the misery index for U.S. policy makers, including the Federal Reserve Bank, we address the issue differently from the previous studies. Specifically, we estimate the probability of the changes in the approval rate with respect to the components of the misery index.

3. Data and Methodology

The monthly observations on all variables are sourced from the Federal Reserve Bank of St. Louis database, FRED (<https://fred.stlouisfed.org/>). The current account balance is reported on a quarterly basis and converted to monthly observations by linear interpolation. This method assigns each value in the quarterly series to the first monthly observation associated with the low frequency period, then places all intermediate points on straight lines connecting these points.

The real hourly wage rate is deflated by the US Consumer Price Index (CPI). The exchange rate of the dollar is the effective rate, which is represented by the Trade-Weighted exchange rate of the US dollar. The presidential job approval rates are monthly averages for the period 1973:1 to 2015:11, and cover the Nixon presidency and the second Obama administration period. The raw data is derived from the database maintained by the University of California at Santa Barbara (<http://www.presidency.ucsb.edu/data/popularity.php>). The Election is a dummy variable that denotes one for election years and zero otherwise. The methodologies adopted are multivariate regressions following Layton’s nonlinear functional form, and logit and probit regressions. We undertake tests for stationarity before estimating any regressions. Layton’s (1992) empirical findings may be invalid as the time series variables may be non-stationary. However, it is important to note that the paper was completed when stationarity tests were in their infancy. We apply the ADF and PP tests of stationarity to test for variable stationarity. We initially proceed by adopting the Layton (1992) methodological approach, because previous research (see Berlemann and Enkelmann (2014)) indicates that a nonlinear functional form may be superior to linear models. However, as (Edwards et al. (1995)) indicates, the saliency of issues as perceived by citizens may shift unexpectedly. Therefore, it may be difficult for any functional formulation to capture a relationship that stems from almost random behavior by the citizens. This may also explain the divergence of empirical econometric results. We estimate the probability that approval rate may respond to economic factors rather than focusing on coefficient estimates. Thus, we estimate logit and probit models that provide econometrically robust estimates using the maximum likelihood methodology. Furthermore, they provide the marginal probabilities of the changes in the approval rate due to changes in unemployment and inflation rate.

4. Empirical Findings

The initial estimation is to adopt the methodological approach of Layton (1992). We estimate and report the results of Equation (1) from Layton’s (1992) paper. The equation is estimated and expressed as follows:

$$APR = \alpha UR^{\beta_1} inf^{\beta_2} mrg^{\beta_3} rhw^{\beta_4} twdol^{\beta_5} e^u \tag{1}$$

The variable definitions are denoted follows:

APR = Monthly US President’s Approval Rate

UR = Unemployment rate

Inflation = Change in Consumer Price Index (CPI)

MRG = Mortgage rate

RHW = Real Hourly Wages

TWDOL = Trade Weighted Exchange Rate of the US Dollar

The economic variables that determine the approval rate of a president are not concretely defined. Furthermore, while there is anecdotal evidence that some economic variables may be associated with a president’s approval rate, the functional relationship is not obvious. Layton (1992) offers justification for including the above variables in his long-linear model. We also examine the linear functional form for probit and logit approach. Important variables that directly impact an electorate are unemployment and inflation because of their impact on household lives. Mortgage rates address housing accessibility, where higher mortgage rates make home ownership inaccessible, and vice versa. Real wage rates directly affect working people’s purchasing power and well-being. The exchange rate of the dollar may

affect the electorate’s confidence in the economy, and thus, a president’s approval rate. The components of the misery index, i.e., unemployment and inflation rates, are included as explanatory variables, as in Layton (1992). This allows us to investigate the impact of the disaggregated misery index on the APR and provide more granular information on these critical variables. Furthermore, the Federal Reserve Bank is mandated by the congress to maintain these two rates and the natural rate of unemployment, assumed to be 5 percent. We picked 5 percent as the natural rate of unemployment, however, the economists are not in total agreement on this rate, which is believed to be in the range of 4.7 to 5 percent. We also include an election dummy variable to capture the effects of election years on the incumbent US President’s approval rate. This variable is equal to one in an election year and zero otherwise.

Table 1, column 1, presents the results that are based on Layton’s estimated equation. Our findings, like Layton’s findings, are not reassuring. Moreover, the results are likely to be spurious given that the APR is stationary or I (0) and all the explanatory variables are all I (1), which requires them to be differenced to render them stationary. Furthermore, autocorrelation is also present as shown by the significance of the Breusch-Godfrey test of autocorrelation, with two degrees of freedom for the chi-squared test.

Table 1. Estimation results of alternative formulations of Equation (1).

Functional Form 1	(1)	Functional Form 2	(2)	Functional Form 3	(3)
Dependent Variable: Natural Logarithm of Monthly Presidential Approval Rate					
Intercept	4.115 ^a (1.183)	Intercept	4.471 ^a (1.195)	Intercept	3.977 ^a (0.033)
LN (UR)	−0.264 (0.400)	LN(TWDOL)	1.055 ^a (−0.18)	DLN(TWDOL)	−0.93 (0.806)
LN(UR)(-1)	−0.206 (0.4)	LN(RHW)	−2.233 ^a (0.499)	DLN(RHW)	−14.896 ^b (6.571)
LN(INF)	−0.008 (0.012)	LN(MRG)	−0.341 ^a (0.075)	DLN(MRG)	0.033 (0.358)
LN(INF)(-1)	−0.016 (0.01)	LN(URt-1)	−0.132 (0.393)	DLN(UR)	−0.244 (0.496)
LN(MRG)	−0.299 ^a (0.078)	LN(URt-2)	−0.044 (0.217)	DLN(CPI)	−20.717 ^a (8.363)
LN(RHW)	−2.036 (0.989)	LN(URt-3)	−0.406 (0.417)	ELECTION	−0.066 (0.049)
LN(TWDOL)	1.010 ^a (−0.189)	ELECTION	−0.064 ^c (0.039)		
ELECTION	−0.066 ^c (0.039)				
F	27.007 ^a	34.853 ^a			5.508 ^a
R ²	0.316	0.35			0.061
B-G	357.357 ^a	404.112 ^a			420.405 ^a

Notes: Columns (1) through (3) report the results of the variations of Equation (1) estimated by the Newy-West heteroscedastic and autocorrelation consistent methodology (HAC). (−1) stands for the lagged natural logarithm of a variable. B-G stands for the Breusch-Godfrey Lagrange Multiplier (LM) test of autocorrelation; D and LN, stand for the first difference and natural logarithm, respectively. ^a significant at 1% level, ^b significant at 5% level, ^c significant at 10% level.

The unemployment and inflation rates for the current and the previous months are negatively associated with the United States President’s Approval rate, but are statistically insignificant. The Real Hourly Wages (RHW) may possibly capture the sentiment of the business world and employers who may view this as inflationary, consequently triggering cost-push inflation. Furthermore, rising RHW may signal that there may be a negative impact on corporate profits. This may have a negative impact on equity markets, which may have a negative impact on U.S. presidents’ approval ratings. The signs on the mortgage rate and election year coefficients are consistent with expectations. The current account balance (CAB) was initially included but excluded due to its statistical insignificance. There may be a range of reasons why this variable may not be statistically significant in our analysis. First,

it is not recorded monthly and it was therefore necessary to interpolate the monthly data. Second, the financial and news media do not focus on the CAB. It is typically examined by academics. Third, the United States has been running a CAB deficit since the mid-1960s. Therefore, it is assumed that the United States will have a current account deficit that may or may not improve on a monthly basis. We re-estimate a slight variation of Equation (1) by the Newey-West method so that we obtain the heteroscedastic and autocorrelation consistent standard deviations and t statistics. These are reported in Table 1, column 2.

Column 2 of Table 1 shows the estimation results after several iterations of the model was estimated. The results show that the unemployment rate is negatively associated with the APR. The inflation rate may be captured by the real wage rate. Importantly, the rising real wage may have two opposing effects. First, it could be a sign of improvements in the labor market, which should positively influence the approval rate of a president. Conversely, rising real wage rates may signal future inflationary periods and be negatively associated with U.S. Presidents' approval ratings. In this sample, the inflationary signal of rising real wage rates dominates.

The Augmented Dickey Fuller (ADF) and Phillips-Perron (PP) tests indicate that the dependent variable APR is stationary, while the remaining explanatory variables are nonstationary. Therefore, we estimate the model by first differencing the explanatory variables. The regression of the United States President's approval rating on the changes in the explanatory variables may still be informative. For example, changes in CPI, if positive, signal rising prices. If there are dramatic rises in price levels, the United States President's approval rating may decline. There may be ambiguous effects on U.S. Presidents' approval ratings if there is an appreciation of the United States dollar. The business community may view this as an indication of future declines in U.S. exports. Conversely, financial markets may view this as the strength of the United States economy and increase the demand for the United States dollar. The Newey-West estimation results of regressing U.S. Presidents' approval ratings on the first difference of the logarithm of the explanatory variables is reported in Table 1, Column 3.

Column 3, Table 1, reports mixed results. While inflationary signals, such as the change in the consumer price index or changes in real wages, are negatively associated with the United States President's approval rating, the unemployment rate and other model variables are statistically insignificant. The Ramsey regression model specification also indicates that there may be problems with model specification. We estimate several alternative specifications. However, we cannot find any robust or concrete relationship between U.S. Presidents' approval ratings and components of the misery index. Furthermore, autocorrelation continues to be a persistent problem, as indicated by the significance of the Breusch-Godfrey Lagrange Multiplier test of autocorrelation with two lags of residuals included in the test regression.

Therefore, our next stage of investigation explores the use of probit and logit models in seeking to rigorously establish a relationship between U.S. Presidents' approval ratings and the macroeconomic variables listed above. We decided to explore the logit and probit models for several reasons. First, the Maximum likelihood (ML) estimates of model coefficients are robust in the presence of various issues, such as autocorrelation and heteroscedasticity. Second, we can compute the marginal probability of U.S. President's approval ratings with respect to changes in unemployment and inflation rates when using the ML coefficient estimates. Third, the efficient allocation of campaign funds to highlight political goals of presidential candidates, as well as accomplishments of incumbents, is paramount for campaign managers and strategists. Measuring the changes in the probability of approval rates in response to changes in unemployment and inflation rates may offer a guide to the allocation of funds in political advertisements. The results from logit and probit models are qualitatively almost identical. Therefore, we report only the estimates of the probit model in Table 2, as well as the probability of U.S. President's approval ratings and the marginal probabilities with respect to the two variables of interest (i.e., unemployment rate and inflation).

Table 2. Maximum Likelihood estimation of the Probit Model.

Dependent Variable: Presidential Approval Rate = 1 if >0.4697, 0 Otherwise	
Intercept	−0.93 (0.629)
CAB	0.003 ^a (0.001)
UR	−0.179 ^a (0.039)
INF	−0.024 ^a (0.073)
MRG	−0.083 ^a (0.03)
TWDOL	0.035 ^a (0.006)
ELECTION	0.267 ^c (0.143)
LR	78.805 ^a
Mc Fadden R ²	0.11
LL	−305.7
Restricted LL	−343.64

Notes: Probit model estimation. LL is the value of log likelihood function. LR is the likelihood ratio testing the null hypothesis restriction that all coefficients are statistically insignificant; ^a significant at 1% level, ^c significant at 10% level.

For logit and probit model estimation, the approval rate (APR) is set equal to one if the United States President’s approval rating is greater than 46.97%, or 0 otherwise. We chose 46.97, even though the mean and median of approval rates are 51%, as based on Chebyshev’s rule, 96% of time the United States President’s approval rating is between 46.97 and 55%. The coefficient of the real hourly wage rate in all attempts, including the logit and probit estimation, behaved erratically with a counter-intuitive sign. Therefore, this variable is dropped in the remainder of the analysis. All coefficients in the probit model are collectively significant with a *p*-value of virtually zero for the loglikelihood ratio test. The test compares the value of the logarithm of the likelihood (LL) function from the model with the LL function from a restricted model, i.e., a model that sets all coefficients except the intercept equal to zero. McFadden’s R-squared is 11%, which is consistent with the value of the log-likelihood ratio statistic. The McFadden’s R-squared measure is derived from the value of the LL values, with and without restrictions that all explanatory variables are insignificant. It is usually lower than the R-squared derived from OLS and its variations. The coefficients of the current account balance, the exchange rate of the United States dollar, and the dummy variable for the election year are all positive and statistically significant. The interpretation of these signs is that as the current account balance improves, so does the United States President’s approval rating. The same is also true of the effective exchange rate of the United States dollar. The election dummy variable is positively associated with the United States President’s approval rating of the incumbent president. The unemployment and inflation and mortgage rates are negatively associated with the United States President’s approval rating, as expected.

We estimate the United States President’s approval rating based on the average of all explanatory variables, the United States Federal Reserve’s inflation target rate, and the natural rate of unemployment of two and five percent, respectively. Based on the estimated coefficients, the United States President’s approval rating is 75.86 per cent, which is significantly above the mean and median of 51 percent. This is a plausible outcome and suggests that if the inflation and unemployment rates are at their targets, i.e., 2 percent and 5 percent, respectively, the United States President’s approval rating would be higher than the median and mean of all U.S. Presidents’ approval ratings. This may suggest the importance of unemployment and inflation on a United States President’s approval rating.

We compute the change in the probability of a United States President’s approval rating, or the marginal probability with respect to changes in unemployment and inflation rates ($\frac{\partial APR}{\partial UR}$, $\frac{\partial APR}{\partial INF}$, respectively). For instance, using the chain rule and the fact that the derivative of the cumulative normal probability with respect to standard normal variable (z) is the standard normal density function, we have:

$$\frac{\partial APR}{\partial UR} = \frac{\partial \Phi}{\partial z} * \frac{\partial z}{\partial UR}$$

$$\frac{\partial APR}{\partial UR} = (\phi|z = X) * \hat{\beta}_{ur},$$

where Φ and ϕ represent cumulative standard normal probability and the standard normal density functions, respectively. X is the vector of average of all explanatory variables, and UR and INF are set at 5 and 2 percent, respectively. The estimated coefficient of the unemployment and inflation rates are $\hat{\beta}_{ur} = -0.179$ and $\hat{\beta}_{inf} = -0.024$, respectively.

The results suggest that for a one per cent increase in the unemployment rate, the probability of a US President receiving approval decreases by 3 percent. The probability that a US President receives performance approval decreases by a probability of 7 per cent for a one per cent increase in the inflation rate. The marginal probabilities, with respect to unemployment and inflation rates, confirm that the misery index could adversely affect the approval prospects of US Presidents. The inflation rate appears to have gained saliency for the electorate relative to the unemployment rate for the period of this study.

- (a) $\frac{\partial APR}{\partial UR} = -0.03219$
- (b) $\frac{\partial APR}{\partial INF} = -0.07018$

5. Discussion

Table 2 shows that the probit model estimation produces results that are intuitively plausible. Previous research has produced mixed results regarding the role of the economy in relation to presidential approval rate (see Berlemann and Enkelmann (2014)). Edwards et al. (1995) offer a cogent explanation for inconsistent findings by researchers. They show that saliency of issues for citizens changes over time in an unpredictable manner. Therefore, econometric models may be incapable of accounting for the unpredictable shifts. However, the probit model enables us to compute the probabilities of change in the presidential approval rate with respect to economic variable rather than significant versus insignificant coefficient estimates.

All coefficients in Table 2 have the expected signs and are statistically significant. Furthermore, the maximum likelihood estimation method ensures that the results are econometrically reliable. Based on these estimates, the electorate is sensitive to the misery index components. Specifically, the components of the misery index are statistically significant in determining the probability of a president performance approval. The electorate is more sensitive to changes in the inflation rate than the rate of unemployment. This could be due to the aging population in the United States and the rising number of retirees on a fixed income. This segment of the population tends to actively participate in the political process and elections and be sensitive to the loss of purchasing power due to rising inflation rates. They may tend to be less concerned with unemployment rate because of their retired status. Not only do the retired individuals enjoy free time to focus on political issues, they also tend to be members of various action groups, such as American Association of Retired persons (AARP). AARP, with its 38 million people memberships in 2018 (roughly 12 percent of the US population), keeps members informed of political and economic changes that may impact their lives. It is plausible that this segment of the population would be more likely to rate a president negatively due to rising inflation rate relative to the increases in the unemployment rate.

Our findings are consistent with findings of research in the past (see Berlemann and Enkelmann (2014)) confirming that unemployment and inflation rate are associated with the probability of changing citizens’ view of presidents’ performance approval inversely.

6. Conclusions

This paper's objective was to determine whether a United States President's job approval ratings are influenced by the Misery Index, using both the Layton's (1992) macroeconomic model and probit and logit regression analysis. Our paper differs from previous research in its emphasis on computing change in the probability of receiving performance approval rather than solely focusing on statistical significance of coefficients of the economic variables.

The results suggest that Layton's model, similar to many other researchers' (see Berlemann and Enkelmann (2014)), does not perform well for the United States when non-stationarity issues are considered. Conversely, we found that both the probit and logit regression analysis suggest that the unemployment and inflation rates significantly influence U.S. Presidents' electoral prospects. For example, a one per cent increase in the unemployment rate decreases the probability of a United States President receiving a positive approval rating by three percent. A one per cent increase in the inflation rate decreases the probability of a U.S. President's favorable approval rating by seven per cent. The marginal probabilities of approval of a president's performance with respect to unemployment and inflation rates confirm that the statement "it's the economy, stupid" may have relevance for politicians seeking to run for public office in the U.S.

Author Contributions: J.M. was the author behind the main idea and objectives of the paper. The authors jointly compiled and completed the data set for the research. Econometric work was jointly completed using Eviews software and authors met at conferences to discuss the findings and perform further econometric work. The analysis of the results was done jointly. J.M. completed the first finished draft of the paper. B.A. and J.M. jointly completed further econometric estimations and revised the paper twice.

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