

# **The Effects of the Outlook of the Economy on Personal Savings in the United States**

**Advanced Microeconometrics**

**University of North Carolina at Charlotte**

## **Introduction**

How are personal savings affected by the outlook for the economy specifically in the United States within the 30 years' time period from today? It is important to observe how the average personal savings percentages change throughout the years because these are the money that is part of the economy, thus should be measured. It is also important to see what factors have a significant impact on savings because savings can be an indicator on the people's outlook of the future. Major events that affected the U.S. market such as the Great Recession in 2007 and the global pandemic of Covid-19 can show these measurements drastically, thus can see the relationships clearer. This is an important topic to discuss on how much personal savings as a percentage out of the disposable income changed throughout the year with the focus on factors such as inflation rate, interest rates, unemployment rates, and GDP, and uncertainty effects on personal savings percentage and to know the relationship and how it would affect whether or not the personal savings percentage would be greatly affected by these factors.

## **Literature Review**

Personal savings accounts are ideal as it provides people with more options to their financial needs. By having a personal savings account, it should lower the concern for money as you have a layer of extra money for emergency uses or any future financial obligations such as retirement (Fontinelle, 2022). Thus, savings are used to decrease the concern for money meaning increased savings are expected from a negative outlook of the economy. A study was conducted in 1998 by Atish Ghosh and Jonathan Ostry on the macroeconomic uncertainty on savings. It was concluded that higher uncertainty would lead to an increase in precautionary savings due to an decrease in investment and decrease in government consumption (Ghosh & Ostry, 1998). This study has proven that people would be incentivized to save to prepare for the uncertain future.

To further explore the study conducted by Ghosh and Ostry, important factors to consider are inflation rates, interest rates, unemployment rates, GDP, and uncertainty effects personal savings. Inflation rate is the rate that describes the falling value of the currency compared to the rising prices of goods and services. High inflation would not be ideal as it means a decrease in economic growth (Fernando, 2022). Interest rate is the percentage rate the bank is willing to pay the money depositor for keeping their money in the bank allowing the bank to lend the money that was deposited to other customers at a higher interest rate. The interest rates are known as annual percentage yield (APY) for savings accounts (Kopp, 2022). Unemployment rate is the percentage rate of unemployed people over the labor force. The labor force includes both of the unemployed and employed people (*U.S. Bureau of Labor Statistics* 2021). Unemployment rate is important to consider because this factor can describe the economy if the rate of unemployment is high or low. Gross Domestic Product (GDP) is the market value of all of the goods for a single country within a particular period. GDP is often used to describe a country's economic growth, the higher the GDP represents more economic development for the country (Fernando, 2022). Uncertainty describes the unpredictability of the future outlook of the economy. An increase in uncertainty will show an decrease in economic growth (Kliesen, 2021). These factors are important to consider as it can help predict or determine the disposable income of personal savings. How would the outlook of the economy affect people's savings habits? In order to address this question we must include these factors to see the magnitude of each variable on how it affects the changes in disposable income of personal savings over the years. As these variables will show how the economy is doing based on major different aspects with uncertainty included to measure the people's outlook as well.

### **Econometric Model and Data**

The objective is to find how these factors affect personal savings percentage out of the disposable income in the United States specifically within the last three decades. Ordinary Least Squares (OLS) regression to model the dataset with the dependent variable as the personal savings percentage and the independent variables as the uncertainty, inflation rates, GDP, unemployment rates, and interest rates. The observations will be from the years 1991 to 2020 using the variable `observation_date` as the time series. The datasets are found on the Federal Reserve Bank of St. Louis and Macrotrends. These data are all observations for the United States measured annually in percentage. After gathering the dataset, it must merge into a single dataset and import the dataset into Stata in order to perform the regression and analyze the data results.

My expected hypothesis for increase in inflation rates should result in decrease in personal savings because the value of the currency that was used for savings has decreased. Increase in interest rates should result in an increase in personal savings because it would benefit the depositor to keep money in the bank if they can earn more interest on their money. Increase in the unemployment rate should decrease the money in the savings account because those savings would now be used for living expenses instead. Increase in GDP should result in decrease in savings because the people are inclined to borrow and invest the money into the economy rather than keeping it in a savings account. Increase in uncertainty should result in an increase in savings because people would be scared to put their money into the market, thus would result in more money to be put on the side for savings.

### **Results**

Figure 3 performs the OLS regression with personal savings as the dependent variable and the factors we are interested in as the explanatory variables. The regression shows high

standard errors and statistically insignificant variables for predicting personal savings. To try to reduce the standard errors, Figure 1 was performed with robust standard errors. The standard errors were still high. In Figure 2, correlation was conducted to test for multicollinearity. As a result, inflation rates and interest rates are close to being classified as strongly correlated with each other as the correlation measure was .6206. This suggests that these two independent variables have a moderate relationship. Due to the high standard errors, figure 4 was conducted to perform the Breusch-Pagan test to test for heteroscedasticity with the null hypothesis being homoscedasticity. The test rejected the null, thus determining the regression has heteroscedasticity in the model. This would affect the OLS by making the standard errors unreliable, but the coefficients would remain unbiased. The presence of heteroscedasticity suggests that there are omitted variables in the model and/or outliers in the model. As the result of the presence of multicollinearity and heteroscedasticity, interest rates were omitted and log was used to transform the independent variables to prevent the Gauss-Markov assumptions from being violated. As a result, the standard errors for inflation decreased in figure 5, but the explanatory variables are still statistically insignificant.

To further explore the factors against personal savings, figure 6 was conducted to see the effects on distributions through quantile regressions. The plot indicates that the log GDP growth, log uncertainty, and log unemployment rates continue to increase as the percentile increases. On the low end of the distribution, log unemployment has strong effects on personal savings meaning when the economy has high unemployment it would have the most effect on those who have low savings. The plot shows a downward trend for log unemployment showing that as the percentile gets higher the log unemployment becomes irrelevant, which makes sense because people who have high amounts of savings are not worried about unemployment rates.

## **Conclusions**

Concluded that there are missing variables that are omitted that are needed for a proper analysis in order to find the true effects of the outlook of the economy on personal savings in the United States. Based on figure 5, log GDP growth, log uncertainty, and log unemployment rates have a positive relationship with personal savings percentage out of the disposable income. Log inflation rates have a negative effect on personal savings percentage out of the disposable income. My hypothesis was incorrect for the relationship effects of unemployment and GDP on personal savings, but was correct with expecting a negative relationship for inflation and a positive relationship with uncertainty. Log of unemployment rates and log of inflation were the largest factors that affect personal savings the most. This concludes that these two variables can show the state of the economy the most out of the other factors listed as independent variables, but with missing variables that are statistically significant as a concern. Further research must be conducted to include these omitted variables to show the true relationships of these factors on personal savings.

Based on the results, an increase in personal savings would result from a negative state of the economy because people are less inclined to borrow and invest into the market, but between inflation and unemployment an increase in these two factors would show a decrease in economic growth. Inflation has a negative effect on savings, while unemployment has an increased relationship on savings. This can be explained because inflation will decrease the value of the currency, thus people are having to use more cash for the same goods. Increased unemployment rates will increase savings as people are less likely to spend when unemployed, thus more money to set aside for savings. This is an indicator that the market is in a bearish market. If there was a

decrease in personal savings it would be resulted from a bullish market because people would be inclined to put money into the market.

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## Figures

Figure 1

```
. reg savings GDPGrowth Inflation interest uncertainty Unemployment, vce(robust)
```

Linear regression

Number of obs	=	30
F(5, 24)	=	1.11
Prob > F	=	0.3834
R-squared	=	0.2680
Root MSE	=	.02309

savings	Coefficient	Robust std. err.	t	P> t	[95% conf. interval]	
GDPGrowth	-.3877857	.5094241	-0.76	0.454	-1.439185	.6636139
Inflation	-.2136993	.7338344	-0.29	0.773	-1.728259	1.300861
interest	-.0577058	.3839481	-0.15	0.882	-.8501357	.7347241
uncertainty	.0112707	.0395588	0.28	0.778	-.0703745	.092916
Unemployment	.2815988	.307515	0.92	0.369	-.353081	.9162786
_cons	.0631169	.0304702	2.07	0.049	.0002295	.1260044

Figure 2

```
. correlate
(obs=30)
```

	observat~e	savings	GDPGrowth	Inflat~n	interest	uncert~y	Unempl~t
observat~e	1.0000						
savings	0.2201	1.0000					
GDPGrowth	-0.3855	-0.4621	1.0000				
Inflation	-0.5111	-0.2618	0.2532	1.0000			
interest	-0.6566	-0.3701	0.4479	0.6206	1.0000		
uncertainty	0.6852	0.2895	-0.4639	-0.4897	-0.5749	1.0000	
Unemployment	0.0438	0.3930	-0.5051	-0.2284	-0.5544	0.1404	1.0000

Figure 3

```
. reg savings GDPGrowth Inflation interest uncertainty Unemployment
```

Source	SS	df	MS	Number of obs	=	30
Model	.004686123	5	.000937225	F(5, 24)	=	1.76
Residual	.012796544	24	.000533189	Prob > F	=	0.1599
				R-squared	=	0.2680
				Adj R-squared	=	0.1156
Total	.017482667	29	.000602851	Root MSE	=	.02309

  

savings	Coefficient	Std. err.	t	P> t	[95% conf. interval]	
GDPGrowth	-.3877857	.2973161	-1.30	0.205	-1.001416	.2258445
Inflation	-.2136993	.5585461	-0.38	0.705	-1.366482	.9390832
interest	-.0577058	.3822895	-0.15	0.881	-.8467125	.7313009
uncertainty	.0112707	.0498118	0.23	0.823	-.0915359	.1140773
Unemployment	.2815988	.3635522	0.77	0.446	-.4687359	1.031934
_cons	.0631169	.0377641	1.67	0.108	-.0148244	.1410583

Figure 4

```
. estat hettest
```

Breusch-Pagan/Cook-Weisberg test for heteroskedasticity  
Assumption: Normal error terms  
Variable: Fitted values of savings

H0: Constant variance

chi2(1) = 23.28  
Prob > chi2 = 0.0000

Figure 5

```
. reg lnsavings lngdpGrowth lnInflation lnuncertainty lnunemployment, r
```

Linear regression

Number of obs	=	26
F(4, 21)	=	1.80
Prob > F	=	0.1667
R-squared	=	0.1905
Root MSE	=	.28245

lnsavings	Coefficient	Robust std. err.	t	P> t	[95% conf. interval]
lngdpGrowth	.076795	.1652379	0.46	0.647	-.2668361 .4204261
lnInflation	-.1253582	.0819867	-1.53	0.141	-.295859 .0451425
lnuncertainty	.0156436	.0923978	0.17	0.867	-.1765081 .2077953
lnunemployment	.3708103	.2259993	1.64	0.116	-.0991809 .8408016
_cons	-1.907691	1.153888	-1.65	0.113	-4.307332 .49195

Figure 6

