THE EFFECT OF THE 2008 TAX REBATES ON CONSUMER ATTITUDES

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ABSTRACT

In 2007, the economy showed significant signs of slowing down. In response, Congress and the President signed into law the Economic Stimulus Act of 2008. Part of the Act gave tax rebates to American taxpayers, specifically up to $600 for single individuals making less than $75,000 and up to $1,200 for families jointly making less than $150,000.

The effect of tax rebates have been debated over time. Historically, rebates have been distributed to provide economic stimuli in times of recessions. The literature indicates that short-term economic benefits exist for tax rebates but reveals little on the long-term effects of such rebates. One way to test for the long-term effect of tax rebates is to measure consumer attitudes toward the economy. Consumer attitudes include such consumer metrics as consumer confidence and the index of consumer sentiment (ICS). Studies have indicated that there is a link between consumer attitudes toward the economy and economic indicators such as gross national product (GNP).

The University of Michigan Survey of Consumers (MSC) computes three indices related to consumer attitudes. These indices include the ICS, the index of current economic conditions (ICC), and the index of consumer expectations (ICE). The Survey includes monthly data on 500 individuals on economic questions related to the formation of these indices. The Survey also collects various demographic data, including age, gender, income, marital status, and education level.
In this paper, the effect of the 2008 tax rebates on the MSC indices is tested controlling for various demographic characteristics. The paper uses an ordinary least squares (OLS) regression to measure the effect of the rebates on these three indices controlling for age, gender, marital status, education level, and race. The study will look at two months in particular, December 2007 and August 2008. Since the actual law was not announced until January of 2008, December 2007 serves as the control month for those who did not know about the impending rebates. August 2008 is a month after all rebates were given, and it serves as the test month.

The results of this study reveal that tax rebates do not have a statistically significant effect on consumer attitudes. None of the three consumer attitude indices are statistically significant at the 95 percent confidence level. I conclude, therefore, that tax rebates do not have an effect on consumer attitudes, and consequentially, the rebates do not affect the economy via consumer attitudes.
Dedicated to my thesis advisor, Ben Harris, my data advisor, Eric Gardner, and my family. Thanks for all your advice and support.
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1 Introduction

In late 2007, the U.S. economy was showing signs of trouble. In the fourth quarter of that year, growing problems in the housing market and a credit squeeze had slowed economic growth to its lowest level since 2002. As the housing market began to crash and foreclosures mounted, then Secretary of Treasury Hank Paulson said in October of 2007 that policymakers should mobilize to alleviate future crises and that the housing troubles could impact the economy and capital markets for some time to come (AFP, 2007). Those words proved prophetic. By early 2008, the economy had stagnated. Consumer spending advanced by 1 percent in the first quarter of 2008, which was its weakest showing since 2001, the last time the economy was in a recession. The collapse of the housing market limited consumers’ ability to borrow against their homes. In addition, fewer jobs and shrinking paychecks had begun to take their toll as Americans cut back on a variety of discretionary purchases to conserve cash for necessary spending. According to the New York Times, such cutbacks in spending were the primary factor in the economic stagnation (Goodman, 2008). Then, in September of 2008, the economy began to slip on the verge of disaster. Starting with the collapse of Lehman brothers, the stock market dove as other banks began to fold. Americans all over the country feared an economic apocalypse and another Great Depression.

As it became clear the U.S. was headed for increasing economic difficulties in late 2007, the President and Congress moved to act. On February 13, 2008, President Bush signed into law the Economic Stimulus Act of 2008. Part of this Act gave tax rebates to low and middle-income families — specifically up to $600 for single taxpayers earning less than $75,000 and up to $1,200 for married couples filing jointly earning less than $150,000. Married couples with
children received $300 extra per dependent child. In order to qualify for payment, a person must have had an income tax liability or qualifying income of at least $3,000. Qualifying income included any combination of earned income and certain benefits from Social Security, Veterans Affairs, or Railroad Retirement (IRS, 2008). For those who made above these $75,000 and $150,000 caps, the rebate check was reduced by 5 percent of the amount earned above the Adjusted Gross Income (AGI) income cap. In March 2008, the Internal Revenue Service (IRS) announced that more than 130 million rebates would be distributed starting May 2 until mid-July (IRS, 2008). For those taxpayers who chose direct deposit, stimulus payments were distributed between May 2 and May 16 provided that returns were received and processed by April 15. For those taxpayers who did not choose direct deposits on their tax returns but whose returns were processed by April 15, paper checks were mailed starting on May 16, with the initial mailings completed around July 11. More than 25 percent of the rebates were distributed in the first three weeks of May (IRS, 2008).

Given the economic conditions in late 2007, the purpose of the 2008 rebates was to increase consumer spending in order to stimulate the economy. Historically, tax rebates have been distributed to produce an increase in spending and to stem economic recessions. According to famed economist John Maynard Keynes, an increase in income tends to increase the marginal propensity to consume (Keynes, 1964). However, economists debate whether such a short-term income boost stimulates spending and economic growth only in the short run or whether such a stimulus also causes increased consumer confidence and more long-term positive effects on the economy. According to the New York Times, the 2008 rebates were viewed as a short-term solution to buy time while the Federal Reserve lowered interest rates to create fresh investment
and hiring (Goodman, 2008). Indeed, consumer growth and gross domestic product (GDP) did grow more in the second quarter of 2008 than if the rebates had not been distributed. However, growth in the following quarter also declined more than it would have if the rebates had not been distributed (Shapiro and Slemrod, 2009). The Congressional Budget Office (CBO) also indicates that tax rebates only have a short-term stimulus effect (Russek, 2009).

Despite the view that tax rebates only have a fleeting effect, one way to test whether they give consumers an overall better long-term view of the economy is to examine indices that indicate consumers’ economic attitudes. A general increase in consumer confidence indices may indicate more sustained spending that could boost the economy in the longer run. Conversely, sudden drops in consumer confidence are often considered the start of economic recessions. When the stock market crashed in 1987, consumer confidence fell but quickly recovered, helping the U.S. dodge a potential recession. However, in 1991, rising oil prices raised consumer worries and stalled the U.S. economy (Kukis, 2008). Various papers have confirmed the link between consumer attitudes and growth. Matsusaka and Sbordone show that gross national product (GNP) is affected by consumer sentiment (2007). Other research has shown that low consumer confidence is associated with lower consumer spending (Ludvigson, 2004). Clearly, there is a link between consumer attitudes and the economy.

This paper examines the effect of tax rebates on consumer attitudes using three indices from the University of Michigan’s Survey of Consumers (MSC). These indices include the index of consumer sentiment (ICS), the index of current economic conditions (ICC), and the index of consumer expectations (ICE). The effect of the tax rebates on consumer attitudes is examined by regressing these indices on receipt of the tax rebates while controlling for various
demographics. Performing such a regression can help determine how consumer attitudes respond to the tax rebates and whether the rebates can actually result in long-term effects on the economy.
2 Literature Review

Various studies have shown that tax rebates tend to influence consumer spending and that consumer attitudes affect the economy. These studies are highlighted in the following summary of the literature on the topic.

Parker et al. (2010) analyze the Consumer Expenditure Survey (CE) with consumption as a dependent variable to explain the effect of the 2008 tax rebates on consumer expenditures. They find that households spent about 12 percent to 31 percent of the rebates on nondurable goods during the period in which payments were received. Durable goods spending also increased, but expenditures were smaller in the subsequent three month period. The study also finds that older, lower-income, home-owning households spent more.

Research by Sahm et al. (2009) using the MSC finds that about one-fifth of 2008 rebate recipients said that the rebates led to increases in spending across all months of the survey. In November and December, about one-fifth said the tax rebates led to increases in saving. During these same months, there was also a slight increase in the rate debt was repaid. The paper also finds that individuals tended to spend the rebates rapidly; typically, rebates were spent within the first three months. This is especially true of lower income households. Consistent with the Parker et al. paper, the oldest groups spent the most. This study, however, does contradict other studies and the CBO that state that lower income households tend to spend more. In the Sahm et al. paper, higher income individuals tended to spend more.

Shapiro and Slemrod (2003) examine the 2001 tax rebates using the MSC and find that, like the 2008 tax rebates, about one-fifth of those who received the rebates said they would spend them (21.3 percent). For those who did not say they would spend them, 32.0 percent said
that their rebates would lead to increased saving, while 46.2 percent said they would lead to paying off debt. Like the 2008 rebates, higher income individuals spent more than lower income individuals. This paper also looks into the differences between stockholders and non-stockholders. Poorer stockholders tended to save, while wealthier stockholders tended to spend. The paper tries to explain the low spending rate by stating that respondents were pessimistic about the size of future tax rebates. The study attaches a rider to the MSC to ask specifically what consumers used the tax rebates for. The survey looks at consumer responses in August, September, and October of 2001. The rebate checks were distributed in August and September of that year.

Johnson et al. (2004), using a rider survey on the CE, find that 20 percent to 40 percent of households spent the 2001 tax rebates on nondurable goods during the three month period the rebates were received. In addition, two-thirds of the rebates were spent during the rebate distribution period and three months afterward. Contrary to the Shapiro and Slemrod (2003) paper, lower income households spent more than higher income households. According to Johnson et al., low income households spent about 62 percentage points more of their rebates on nondurable goods than typical. This difference between the Johnson et al. and the Shapiro et al. studies can probably be explained by the difference in what consumers said they would spend and what they actually spent. Examining consumer attitudes may help predict how consumers actually feel about the economy when tax rebates are distributed, explaining such a difference. Compared to the Shapiro et al. study, the Johnson et al. paper is more of a panel study looking at periods before, during, and after the rebates were distributed. The paper finds that the maximum amount of spending occurred while the rebates were distributed, the second-most amount of
spending occurred after the rebates were disbursed, and the least amount of spending occurred before the rebates were disseminated. It is possible that consumers viewed the economy differently at each stage, and consumer attitudes may be a good way to judge why spending varies across time periods.

Another study by Shapiro and Slemrod (2002) uses the MSC to analyze whether the 2001 tax rebates stimulated spending. The paper finds that people actually spent more than they originally predicted when interviewed six months after the rebates were disbursed, while they saved less and paid off debt more. The study examines consumer responses during the time the rebates were received, a month after, and a period six months after the rebates were distributed. In addition, the paper indicates that being better off financially than a year ago is associated with a higher spending rate.

The literature also addresses broader policy implications regarding the 2001 tax cuts. Gale and Potter (2002) find that the 2001 tax cuts were fiscally unsustainable and did not raise long-term growth. Instead, the cuts increased burdens on future generations as well as raised interest rates. According to the paper, the tax cuts also favored the rich. The paper does acknowledge, however, that lower tax rates raise incentives for people to work, acquire human capital, save, and invest. Orszag and Greenstein (2002) argue that the 2001 tax cuts had two countervailing effects on the economy. In the short run, tax cuts that had already taken place exerted a positive effect on the economy by boosting consumer spending. However, tax cuts scheduled for future years would exert a negative effect on the economy in the short run. The cuts immediately raised long-term interest rates and increased the cost of business investment and home mortgages. The paper argues that the overall effect of the tax cuts were negative.
because the higher long-term interest rates impacted the economy more negatively than the positive effect of increased spending at the time.

Steindel (2001) conducts a historical examination of tax changes, studying the effect of tax changes on consumer spending from 1968 to 1982. He discovers that consumers will likely boost spending if the change in tax liabilities is permanent. Consumers will also wait to increase spending until a tax change affects their take-home pay. His work suggests that examining consumer attitudes may help determine how economic forecasts affect spending before and after tax rebates are distributed, as well as their effect on spending based on future tax cuts.

The literature also examines the effects of consumer attitudes on spending and the economy. Sydney Ludvigson (2004) studies consumer confidence and consumer spending using the University of Michigan’s ICS and the Conference Board’s Consumer Confidence Index (CCI), finding that these measures of consumer confidence have significant predictive power for quarterly consumption growth. Moreover, the University of Michigan and Conference Board indices have incremental forecasting power for total personal consumer expenditure growth. This paper is important for the present study because it finds a link between consumer confidence and consumer expenditure.

Finally, Matsusaka and Sbordone (1995) look at the relationship between consumer confidence and GNP, finding that consumer sentiment has a statistically significant effect on GNP in the United States from 1953 to 1988. Between 13 percent and 26 percent of the variance of GNP innovations is the result of consumer sentiment. Therefore, the paper concludes, consumer confidence is an important independent factor in explaining economic fluctuations.
3  Conceptual Framework and Hypothesis

This paper evaluates the effect of receiving a stimulus check on consumer attitudes, with these attitudes measured by consumers’ answers to questions about how they feel about the economy. These questions can predict the direction the economy is moving. Consumer attitudes can be evaluated in a number of ways. One of the ways consumer attitudes are measured is the U.S. CCI. This survey is conducted by The Conference Board, an organization that conducts consumer analysis. This paper uses indices computed by the MSC to measure consumer attitudes. The calculation of consumer attitudes in this study comprises three indices used in the MSC: the ICS, ICE, and ICC.

The ICS is a factor computed from five questions. It measures consumer attitudes on the business climate, personal finance, and spending. It also forecasts consumers’ future spending. The questions are:

1. Are people better off or worse off financially than they were a year ago?
2. Do people think they will be better off or worse off financially a year from now?
3. Do people think that business conditions will be good or bad within the coming year?
4. Do people think that good times will continue during the next five years, or that there will be periods of unemployment and depression?
5. Do people think it is good time or bad time to buy major household items?

The responses are entered into a formula that generates the ICS. The ICE is similarly an index that is calculated from questions two, three and four above. The ICC is calculated from questions one and five.
These indices of consumer attitudes can be affected by a variety of factors. Generally, economic conditions at the time of the survey influence the indices. When the economy is doing poorly, consumer confidence is generally low and vice versa when the economy is doing well. Aside from actual economic performance, various demographic factors can influence consumer attitudes. These include age, income levels, race, gender, disability status, and location. For example, studies have shown that lower income individuals and older people spent more of the 2008 tax rebates (Parker et al., 2008). However, when asked whether they would spend, save, or repay debt with the rebates, higher income consumers said that they would spend a larger share of their rebates than lower income consumers said they would spend (Shapiro and Slemrod, 2003). This difference in actual spending and predicted spending may be because consumers perceive the economy in different ways before, during, and after stimulus checks are distributed. Examining consumer attitudes for various demographics may determine how different segments of the population feel about the economy and their propensity to consume before, during, and following the 2008 tax rebates.

Theoretically, the receipt of a stimulus check may change consumer attitudes. An economic stimulus, in theory, should increase a consumer’s marginal propensity to consume. Basic consumer choice theory states that people tend to maximize their utility subject to a given budget constraint.\(^1\) When a stimulus is distributed, the budget constraint expands since people have more money to spend, allowing individuals to increase their utility by consuming more goods. Moreover, according to economic theory, an increase in income tends to increase the marginal propensity to consume (Keynes, 1964). However, individuals may also save or invest

\(^1\) Utility is defined as the level of satisfaction individuals obtain from consuming goods (Besanko and Braeuigam, 2008).
more with their increased income. The goal of a stimulus is to increase consumers’ income and propensity to consume, causing greater spending and boosting the economy. By examining consumer attitudes, I can forecast consumers’ view of the economy and whether they are more inclined to spend in the long-term. According to recent research, higher consumer confidence indicates greater consumption (Ludvigson, 2004). This paper hypothesizes that receiving a tax rebate has a positive effect on the ICS, ICE, and ICC when controlling for age, gender, education level, marital status, and race.
4 Data and Methods

4.1 Data

The data used for this study is the MSC conducted by the University of Michigan’s Survey Research Center. The Survey is conducted monthly and consists of approximately 500 telephone interviews with adult men and women living in households in the contiguous U.S. An independent, cross-sectional sample of households is drawn for each monthly sample. The respondents in the drawing are then reinterviewed six months later. The total sample for any survey is normally composed of 60 percent new respondents and 40 percent being interviewed for the second time. The method used to draw the monthly sample is random digit dialing telephone sampling in which random telephone numbers are used to conduct the survey. The survey is a stratified, one-stage, equal-probability sample of telephone households. Corrections for non-telephone ownership, survey nonresponse, and panel attrition are done through post-stratification by selected demographic characteristics. In addition, data from the Current Population Survey (CPS) is used to adjust for variations in the age and income distributions in the monthly samples.

The MSC collects data on a number of questions. Specific to consumer attitudes, the study asks economy-based questions that are used to calculate the ICS, ICC, and ICE. These questions are discussed in the Methodology section below. The survey also asks other economic questions related to consumers’ feelings about the economy, including trends in personal financial situations, income expectations, price expectations, perceptions of business conditions, employment, and buying conditions. Finally, the survey collects demographic data including age, gender, race, marital status, region, income level, and education.
The sample used in this paper is broken down into individuals who did and did not receive the 2008 tax rebates. The subsample of full tax rebate recipients consists of single taxpayers who made an AGI of less than $75,000 and couples filing jointly who made an AGI of less than $150,000. For those who earned more than these amounts, the rebates were reduced by 5 percent of the amount over the AGI. Those who earned at least $3,000 from Social Security or veterans’ disability benefits also received rebates.

The sample is limited to the months of December 2007 and August 2008. The tax rebate law was not passed until January 2008. The month of December 2007 is therefore chosen because individuals were not aware of the tax rebates at this point. The data from this month serves as a control for those individuals who did not receive the rebates. The tax rebates were distributed from the start of May to mid-July. The month of August 2008 is used because by this point, all individuals who were supposed to receive rebates would have received their rebates. This separation of data by these two months allows a comparison of consumer attitudes before and after the tax rebates were distributed. According to the data, there were 388 individuals who would have received the full rebate in December 2007 and 66 who would not have received the full rebate in the same month. Similarly, in August of 2008, 366 individuals received the full rebate while 94 did not receive the full rebate.

One of the largest limitations of the sample is the small sample size of 500 individuals per month. Other data sets, including the Survey of Consumer Finances and the CPS, contain much larger sample sizes. Smaller surveys such as the MSC could lead to increased sampling error compared to surveys with larger sample sizes.
4.2 Methodology

This paper hypothesizes that receiving a tax rebate has a positive effect on the ICS, ICE, and ICC when controlling for age, gender, education level, marital status, and race. The method used to conduct the study consists of comparing average index values of the ICC, ICS, and ICE between control and treatment groups before and after the rebates were disbursed. The control group consists of those individuals who did not receive a full tax rebate, while the treatment group consists of those who received a full rebate. Using regression analysis, I compare whether average index values change more for the control group or the treatment group.

Dependent variables used in the regression are described here. The ICS is defined by the following questions:

1. Are people better off or worse off financially than they were a year ago?
2. Do people think they will be better off or worse off financially a year from now?
3. Do people think that business conditions will be good or bad within the coming year?
4. Do people think that good times will continue during the next five years, or that there will be periods of unemployment and depression?
5. Do people think it is good time or bad time to buy major household items?

The actual formula consists of the following equation, which is derived from the questions above (each of the five questions above will be assigned a variable \( X \) for the question score, with the subscript being the question number):

\[ ICS = \left( \frac{X_1 + X_2 + X_3 + X_4 + X_5}{6.7558} \right) + 2.0 \]

The number 6.7558 is the 1966 base period total, and 2.0 is a constant to correct for sample design changes from the 1950s. Using the same procedure, the ICC is calculated as follows:
\[ ICC = \left( \frac{X_1 + X_5}{2.6424} \right) + 2.0 \]

Similarly, the ICE is computed from the following formula:

\[ ICE = \left( \frac{X_2 + X_3 + X_4}{4.1134} \right) + 2.0 \]

(See the Appendix for the actual values of each of the questions used to compute the indices.)

The independent variables used in the regression include a dummy variable for tax rebates. The number one represents those individuals who received the tax rebates while zero represents individuals who did not receive the tax rebates. The income variable simply asks for total income received from the previous year.

The variable for marital status contains the following responses: Married/Partner, Separated, Divorced, Widowed, and Never Married. The age variable simply asks for respondents’ age. The sex variable asks individuals whether they are male or female. The race variable contains the following responses: White except Hispanic, African American except Hispanic, Hispanic, American Indian or Alaskan native, and Asian or Pacific Islander. The education variable asks individuals for the highest grade of school or year of college completed.

The following describe the model used in this paper, including the population used for the analysis and the regression model. The population used in this study consists of a random sample of individuals in December 2007 who did not know about the rebates and a random sample of individuals in August 2008 who did and did not receive the rebates in the prior months. Those who did not receive the full rebate include singles who earned an AGI of $75,000 or above and couples who earned $150,000 or above. Those who received the full rebate consist of single taxpayers who made an AGI of less than $75,000 and couples filing jointly who made an AGI of less than $150,000. For those who made more than this amount, the
rebates were reduced by 5 percent of the amount over the AGI. Those who earned at least $3,000 from Social Security or veterans’ disability benefits also received rebates.

The tax rebates were distributed from the start of May to mid-July. The reason for including data from the month of December 2007 is that the passage of the actual law giving tax rebates occurred in January 2008. By using data for December 2007, this study identifies individuals would not have known that they were to receive the rebates. Had they known about the rebates, their consumer attitudes would likely have been different. August 2008 is used because this month represents the first month after all the rebates were distributed. Consumer attitudes for the month of August should reflect the result of the rebates.

I use an ordinary least squares (OLS) regression model because consumer attitudes and expectations of the economy are expected to linearly increase with receipt of the rebates. The regressions contain the following dependent variables: the ICS, ICC, and ICE. These indices together give a general sense of consumer attitudes. The independent variables include consumer index values in December 2007, a dummy variable for whether the rebates were disbursed or not, and variables for age, gender, education, marital status, and race. Since income is very highly correlated with receipt of the rebates, it is not included in the regression models.

The regressions test the effect of the tax rebates on consumer attitudes controlling for age, gender, education, marital status and race. Below are the mathematical expressions for the three regressions performed in this study.

\[
ICS_{Aug.\ 2008} = \beta_0 + \beta_1ICS_{Dec.\ 2007} + \beta_2\text{taxrebate} + \beta_3\text{age} + \beta_4\text{gender} + \beta_5\text{education} + \beta_6\text{maritalstatus} + \beta_7\text{race}
\]

\[
ICC_{Aug.\ 2008} = \beta_0 + \beta_1ICC_{Dec.\ 2007} + \beta_2\text{taxrebate} + \beta_3\text{age} + \beta_4\text{gender} + \beta_5\text{education} + \beta_6\text{maritalstatus} + \beta_7\text{race}
\]
\[ ICE_{Aug. 2008} = \beta_0 + \beta_1 ICE_{Dec. 2007} + \beta_2 \text{tax rebate} + \beta_3 \text{age} + \beta_4 \text{gender} + \beta_5 \text{education} + \beta_6 \text{marital status} + \beta_7 \text{race} \]
5 Results

5.1 Descriptive Results

The preliminary findings, including the descriptive statistics and frequency distributions for the data, are highlighted in Table 1, below. Examining the descriptive statistics in Table 1, the ICE, ICC, and ICS are all less in August 2008 than in December 2007. In addition, those taxpayers not projected to receive the full rebates report higher average indices than those projected to receive the full rebates. Those who are not projected to receive the rebates are wealthier than those who are projected to receive the rebates, possibly explaining their better views of the economy. In fact, recent Gallup Poll data shows that higher income individuals tend to have better views of the economy than lower income individuals (Jacobe, 2011). Examining the income variable, the average income of those not projected to receive the full rebates is over $180,000 compared to average incomes of less than $60,000 for those projected to receive the full rebates. Interestingly, the wealthier individuals who did not receive full rebates are younger than the less wealthy individuals who did receive the rebates. These wealthier individuals are also more educated than the less wealthy individuals.

Examining the frequency distributions in Table 1, the proportion of females is significantly higher than the proportion of males. More than half of the sample is females projected to receive the rebate in December 2007. Moreover, a large majority of the sample is white. The majority of individuals are also married. Finally, a large majority of individuals are projected to receive or received the full tax rebates, indicating they have salaries below $75,000 or $150,000 for families. Also notable, the number of people projected to receive the full rebate actually decreases from December of 2007 to August of 2008.
Table 1: Means and Frequency Distributions of Variables$^{(1), (2)}$

<table>
<thead>
<tr>
<th>Variable</th>
<th>December 2007</th>
<th>August 2008</th>
<th>December 2007 (projected to get rebate)</th>
<th>December 2007 (projected to get reduced rebate)</th>
<th>August 2008 (received rebate)</th>
<th>August 2008 (did not receive full rebate)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Index of Consumer Expectations$^{(3)}$</td>
<td>63.94 (44.10)</td>
<td>58.08 (41.74)</td>
<td>66.34 (44.23)</td>
<td>76.77 (43.55)</td>
<td>55.14 (40.86)</td>
<td>70.02 (43.16)</td>
</tr>
<tr>
<td>Economic Conditions</td>
<td>91.26 (49.51)</td>
<td>72.26 (52.70)</td>
<td>91.25 (49.39)</td>
<td>109.23 (46.75)</td>
<td>68.69 (51.97)</td>
<td>90.57 (53.39)</td>
</tr>
<tr>
<td>Index of Consumer Sentiment</td>
<td>74.62 (38.14)</td>
<td>63.63 (37.70)</td>
<td>74.26 (37.91)</td>
<td>89.47 (36.23)</td>
<td>60.44 (36.73)</td>
<td>78.06 (38.32)</td>
</tr>
<tr>
<td>Income</td>
<td>74,680.51 (77,162.26)</td>
<td>84,909.44 (82,135.73)</td>
<td>56,746.49 (34,938.45)</td>
<td>180,219.60 (145,217.30)</td>
<td>58,558.33 (34,054.51)</td>
<td>187,510.60 (123,982.60)</td>
</tr>
<tr>
<td>Age</td>
<td>53.42 (16.94)</td>
<td>53.38 (15.22)</td>
<td>53.04 (16.59)</td>
<td>48.38 (14.72)</td>
<td>53.35 (14.98)</td>
<td>50.33 (14.46)</td>
</tr>
<tr>
<td>Education completed</td>
<td>14.05 (2.43)</td>
<td>14.35 (2.34)</td>
<td>13.80 (2.44)</td>
<td>15.56 (1.63)</td>
<td>14.02 (2.33)</td>
<td>15.69 (1.64)</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>40.64%</td>
<td>45.02%</td>
<td>34.58%</td>
<td>6.83%</td>
<td>35.43%</td>
<td>11.09%</td>
</tr>
<tr>
<td>Female</td>
<td>59.36%</td>
<td>54.98%</td>
<td>50.88%</td>
<td>7.71%</td>
<td>44.13%</td>
<td>9.35%</td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White Except Hispanic</td>
<td>83.40%</td>
<td>85.34%</td>
<td>71.11%</td>
<td>12.22%</td>
<td>66.08%</td>
<td>18.60%</td>
</tr>
<tr>
<td>African-American Except Hispanic</td>
<td>7.89%</td>
<td>6.43%</td>
<td>6.67%</td>
<td>1.11%</td>
<td>6.56%</td>
<td>0.22%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>5.67%</td>
<td>5.42%</td>
<td>5.33%</td>
<td>0.67%</td>
<td>4.81%</td>
<td>0.88%</td>
</tr>
<tr>
<td>American Indian or Alaskan Native</td>
<td>1.01%</td>
<td>1.41%</td>
<td>0.89%</td>
<td>0.22%</td>
<td>1.53%</td>
<td>0%</td>
</tr>
<tr>
<td>Asian or Pacific Islander</td>
<td>2.02%</td>
<td>1.41%</td>
<td>1.33%</td>
<td>0.44%</td>
<td>0.66%</td>
<td>0.66%</td>
</tr>
<tr>
<td>Marital Status</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married/partner</td>
<td>64.67%</td>
<td>62.15%</td>
<td>56.39%</td>
<td>8.59%</td>
<td>50.43%</td>
<td>11.96%</td>
</tr>
<tr>
<td>Divorced</td>
<td>11.78%</td>
<td>15.74%</td>
<td>9.69%</td>
<td>2.64%</td>
<td>12.39%</td>
<td>3.91%</td>
</tr>
<tr>
<td>Widowed</td>
<td>11.18%</td>
<td>10.56%</td>
<td>9.91%</td>
<td>0.22%</td>
<td>8.04%</td>
<td>1.30%</td>
</tr>
<tr>
<td>Never Married</td>
<td>12.38%</td>
<td>11.55%</td>
<td>9.47%</td>
<td>3.08%</td>
<td>8.70%</td>
<td>3.26%</td>
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<td>Rebate</td>
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<td></td>
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</tr>
<tr>
<td>Received full rebate</td>
<td>85.46%</td>
<td>79.57%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Did not receive full rebate</td>
<td>14.54%</td>
<td>20.43%</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

$^{(1)}$ Author’s calculations based on Michigan Survey of Consumers Data

$^{(2)}$ Numbers with percentages reflect frequency distributions

$^{(3)}$ See Methodology section for explanations of ICE, ICC, and ICS
In addition to the descriptive results above, the ICS, ICC, and ICE are plotted from 2000 to 2010 and from September 2007 to December 2008 as shown in Figures 1 and 2. All three indices follow the same general pattern in each of these time periods. The ten-year period from 2000 and 2010 gives a general perspective of the indices and their movement over time. Notably, the indices were the highest at the beginning of 2000 during this period. From early 2007 to late 2008, the indices dropped considerably, reaching levels that were about half of what they were in the beginning of 2000.

More relevant to this paper, Figure 2 covers the period of time of the 2008 tax rebates as well as the economic meltdown in 2008. In October of 2007, the stock market was at its highest level ever. The indices, while not as high as 2000, were close to the highest levels of the 2000 to 2010 decade depicted in the figure. From this point onward, the indices generally declined with the exception of a few upticks. During the period of the tax rebates, from early May to mid-July of 2008, the indices decreased, reaching their lowest point ever in June but increasing from June to July of 2008. Consumers were likely worried about declining economic conditions at the time given the low index numbers seen during the period of the tax rebates.
Figure 1: ICS, ICC, and ICE (2000 – 2010)

Source: Michigan Survey of Consumers
5.2 Regression Results

Table 2 provides regression results for the effect of tax rebates on consumer confidence indices. ICS increases with receipt of the tax rebates, both controlling and not controlling for demographics. However, when controlling for demographics, ICS increases by more than double compared to the regression value when not controlling for demographics. While ICS increases by almost 4 points with receipt of the tax rebate when controlling for demographics, ICS only increases by about 1.6 points when not controlling for demographics. In both regressions, the effect of ICS in December 2007 on ICS in August 2008 is economically insignificant.

Examining the regression results with demographics, being white seems to have the largest effect on the ICS. On average, white individuals have an ICS that is about 6 points lower than those who are not white. Education also seems to have an economically significant effect on ICS. For every one year increase in education, ICS increases by about 1.6 points. Being married has the next most significant effect, while age and gender do not produce noticeable effects. It should be noted that none of the coefficients in the ICS regressions are statistically significant at the 95 percent confidence level.

The regression with ICC as the dependent variable is markedly different from the ICS regression. Following the rebate, the ICC index decreases for the regressions with and without demographics. In addition, the ICC decreases significantly more when not controlling for the demographics. After the receipt of the tax rebate, ICC goes down by about 2.6 points for the regression without demographic controls, while it decreases only about 0.2 points when accounting for demographics. In this case, the effect of the ICC in December 2007 on the ICC in August 2008 is even less significant.
Examining the ICC regression when controlling for demographics, the most economically significant variable is again race, although the sign is reversed compared to the ICS regression. Whites have an ICC that is about 12 points lower than non-whites. However, those who are married have an ICC that is about 3.5 points higher than those who are not married. Education is also economically significant, as every year increase in education results in about a 2 point increase in the ICC. Gender has an effect as well, as being male results in a 1.5 point decrease in ICC compared to females. Age has a less noticeable effect on ICC. Again, it should be noted that none of the coefficients are statistically significant at the 95 percent confidence level.

The results for the ICE present a different picture from the ICC. The receipt of the tax rebate result is in fact similar to the ICS result as the coefficient when controlling for demographics is almost double the coefficient when not controlling for demographics. Once again, the effect of the ICE in December 2007 on the ICE in August 2008 is negligible.

The effect of the demographics on ICE mainly ranges from about 1 to 2 ICE points. Race once again has the greatest effect, as those who are white have an ICE that is almost 2 points lower than those who are not white. Education has the second highest effect, as each year of education leads to an ICE that is 1.2 points higher. Being married has a lesser effect, as those who are married have an ICE that is about 0.9 points lower than those who are not married. Gender has about the same magnitude effect as being married with the opposite sign. Males have a 0.9 point increase in ICE compared to females. Age has a negligible effect on ICE. Like the ICS and ICC regressions, it should be noted that none of these results are statistically significant at the 95 percent confidence level.
Table 2: ICS, ICC, and ICE Regression Results*

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(1)</td>
</tr>
<tr>
<td>Receipt of Tax Rebate</td>
<td>1.56 (5.10)</td>
<td>3.92 (5.33)</td>
<td>-2.57 (7.18)</td>
</tr>
<tr>
<td>ICS (Dec. 2007)</td>
<td>0.063 (0.047)</td>
<td>0.059 (0.049)</td>
<td>-0.0013 (0.051)</td>
</tr>
<tr>
<td>Age</td>
<td>0.060 (0.11)</td>
<td>0.26 (0.16)</td>
<td>-0.089 (0.13)</td>
</tr>
<tr>
<td>Male</td>
<td>-0.12 (3.71)</td>
<td>-1.46 (5.19)</td>
<td>0.90 (4.10)</td>
</tr>
<tr>
<td>Education Completed</td>
<td>1.55 (0.79)</td>
<td>2.15 (1.11)</td>
<td>1.19 (0.88)</td>
</tr>
<tr>
<td>Married</td>
<td>0.62 (3.95)</td>
<td>3.50 (5.54)</td>
<td>-0.90 (4.36)</td>
</tr>
<tr>
<td>White</td>
<td>-5.93 (4.93)</td>
<td>-11.89 (6.91)</td>
<td>-1.92 (5.45)</td>
</tr>
</tbody>
</table>

* Author’s calculations based on Michigan Survey of Consumers Data
** = Significant at p<.05
*** = Significant at p<.01
**** = Significant at p<.001.
6 Discussion

This paper aims to determine the effect of the 2008 tax rebates on consumer attitudes. In previous studies, tax rebates have been shown to increase consumer spending, especially in the short-term. However, the effect of the tax rebates on long-term growth has not been studied in depth. One indicator of long-term growth is consumer attitudes, which have been tied to such economic indicators as GNP and consumer spending. Consequentially, studying the effect of tax rebates on consumer attitudes can indicate a more expanded effect for such rebates on the economy.

The results of this study reveal that tax rebates do not have a statistically significant effect on consumer attitudes. The overall regression results show that none of the coefficients are statistically significant at the 95 percent confidence level. This indicates that the tax rebates possibly did not have an effect on consumer attitudes.

Before further analyzing the results, there are shortcomings to the analysis that should be noted. The regression does not control for income because income is highly correlated with the main explanatory variable, tax rebates. Obviously, due to the criteria for receiving a rebate, there is a difference in income between those who received the rebates and those who did not receive the full rebates. Furthermore, the descriptive statistics show that those who received the rebates also had lower consumer attitude indices scores. Because of this correlation between income, the tax rebates, and consumer attitudes, it may be difficult to determine if I am measuring the effect of rebates or the effect of income on consumer attitudes. In this study, it is difficult to overcome such a shortcoming. Ideally, a companion measure of well-being, such as net wealth, would be included as an explanatory variable. Unfortunately, such data is not available.
Despite these shortcomings, the finding that tax rebates possibly have no effect on consumer attitudes is significant and relevant to today’s economy. As of 2011, the economy is still struggling to recover from the recession that gripped the nation from 2007-2009. Unemployment rates are still high, while concerns about the U.S. deficit have further hurt the economy. From a policy perspective, it is clear from the literature that consumers do spend some portion of their tax rebates. Such spending due to the tax rebates provides a stimulus to the economy by increasing aggregate consumption (Parker et al., 2001). However, the effect on consumer sentiment is less understood. As consumer sentiment has been shown to forecast GDP and other economic indicators, including the onset of recessions (Curtin, 2002), tax rebates may not directly influence overall economic health via consumer confidence. Their effect, therefore, may be more limited on the economy than if they did influence consumer attitudes.

I can conclude then, that based on the results of this study, tax rebates may produce temporarily increased spending but do not affect how consumers view the economy. However, just because tax rebates do not influence consumers’ views of the economy does not preclude tax rebates from having other positive effects on the economy aside from increased aggregate consumption. Further research on the exact effects of the tax rebates on the economy must be conducted to truly understand their effect.
Appendix

The questions used to obtain the ICS, ICC, and ICE are comprised of the following values:

Question 1 (X₁):
1=Better now
3=Same
5=Worse now

Question 2 (X₂):
1=Will be better off
2=Same
5=Will be worse off

Question 3 (X₃):
1=Better a year from now
3=About the same
6=Worse a year from now

Question 4 (X₄):
1=Good times
2=Uncertain
3=Bad times

Question 5 (X₅):
1=Good
3=Pro-Con
5=Bad
Bibliography


