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How effective is the 2020 stimulus check in Minnesota and Wisconsin counties?

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Abstract

This study estimates the multiplier impact of the first round of stimulus checks provided under the CARES Act 2020. Data was collected through a phone and online survey of individuals in 25 counties of Minnesota and Wisconsin. Survey data is utilized to compute the average marginal propensity to save and the multiplier. The results demonstrate a statistically significant difference between the location-specific multipliers and income-specific multipliers of Minnesota and Wisconsin. Counties with smaller towns have a higher multiplier impact (2.98) compared to counties with larger cities (2.24), and lower-income individuals create a larger multiplier impact (3.17) as opposed to higher-income individuals (2.00). The study finds that the gender-specific multipliers are not statistically different.

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1. Introduction

COVID-19 has hit the U.S. economy very hard since March 2020. The Federal Reserve made the first official recognition of the effect of COVID-19 on the U.S. economy during the Federal Open Market Committee meeting on January 28-29, 2020. The committee stated that "the threat of the coronavirus, in addition to its human tolls, had emerged as a new risk to the global growth outlook" (Federal Reserve, 2020). Although the federal government announced a task force to monitor, contain, and mitigate the spread of the virus at the end of January 2020, the virus continued to spread across the country. Several big cities along the East and West Coasts were heavily affected. After the federal government proclaimed a national emergency concerning COVID-19 on March 13, many states, including Wisconsin and Minnesota, issued emergency orders to slow the spread of the disease by limiting human interactions. In late March and the beginning of April 2020, the Department of Health Service in Wisconsin announced a Safer at Home order, and Minnesota announced a mass gathering ban and Peacetime Emergency order. The residents of Minnesota and Wisconsin were ordered to stay in their homes with the exceptions of the essential and critical sectors. U.S. economic activities came to a standstill with the stay-at-home order. Real GDP in the second quarter of 2020 decreased 31.4 percent at the annual rate (Bureau of Economic Analysis, 2020). The abrupt halt in economic activities resulted in significant losses of business revenue and massive layoffs. The U.S. unemployment rate shot up to 14.1 percent in April (Bureau of Labor Statistics, 2020), which was the highest since the 2008 Great Recession. According to the Federal Reserve Bank of Minneapolis (2020), consumer spending in Wisconsin and Minnesota dropped by more than 30 percent (compared to January 2020) from the end of March to April. The number of job postings in both states also declined dramatically during April 2020. The decrease in economic activities resulted in an unemployment peak in both states. Wisconsin experienced a 13.6 percent unemployment rate in April, and Minnesota reached a 9.9 percent unemployment rate in May 2020.

Both monetary and fiscal policies were immediately imposed to counter the economic recession. The Federal Reserve reacted to the economic shock by reducing the target range of federal funds to near zero as well as providing emergency funding programs. The U.S. Congress passed The Coronavirus Aid, Relief, and Economic Security Act (The CARES Act) during the second quarter. The CARES Act provided a $2 trillion economic relief package of assistance for workers and families, small businesses, and state, local, and tribal governments. In April 2020, the CARES Act provided $300 billion of stimulus checks to individuals whose 2019 income was less than $99,000 or $198,000 for joint filers (U.S. Department of the Treasury, 2020). Individuals who earned up to $75,000 received $1,200. Those who earned more than $75,000 but less than $99,000 received less than $1,200. The federal government intended to use this measure to mitigate the decline in aggregate demand and stimulate consumer spending during the crisis. How effective has this policy been? We started by looking at the effect of the shock on consumer spending and surveying individuals' reactions to the stimulus checks.

After the stimulus checks were paid in April 2020, consumer spending in the U.S. rebounded back at the end of the month and gradually increased from May through November (Federal Reserve Bank of Minneapolis, 2020). Consumer spending in Wisconsin and Minnesota showed the same patterns as the U.S. average. The U.S. unemployment rate dropped from 14.7 percent in April to 13.3 percent in May. It then decreased significantly after that until it reached 6.7 percent in November and December 2020 (Bureau of Labor Statistics, 2020). Unemployment rates in Wisconsin and Minnesota also declined to 5 percent and 4.4 percent, respectively (from 13.6 percent and 9.9 percent peaks in April and May).

Studies have confirmed that consumer spending dropped dramatically, especially during March 2020. Dunn, Hood, and Driessen (2020) evaluated the economic effects on U.S. consumer spending using daily card transactions and found that spending on accommodations and restaurants declined by 80 and 70 percent, respectively, by the second week of March. They estimated that the aggregate pandemic effect on consumer spending after mitigation measures was around 27.8 percent. Alexander and Karger (2020) used county day-level data to examine the pattern of people mobility, spending behavior, and the differences of the behavior before and after the stay-at-home order in March and April. They found that the stay-at-home order decreased spending at restaurants and retail stores but increased spending on food delivery services.

The rebound of consumer spending and decrease in unemployment can be explained by the effect of the stimulus checks and other government measures. Although the stimulus checks prompted an increase in household spending, many factors caused the fiscal policy to be less effective. The size of the fiscal multiplier can be varied by the state of the economy and income of households. Several studies found that the multipliers are not necessarily large when the unemployment rate is high or when the economy is in recession. Another group of studies found the opposite, confirming that the fiscal multipliers are larger during a slack state of the economy.

Baker et al. (2020) discussed the effectiveness of the 2020 stimulus payments compared to the 2001 and 2008 stimulus programs. They found that household spending increased by $0.25-$0.40 during the first weeks after receiving the payments. This response is faster than those of past stimulus programs. However, substantial increases in payments reflect short-term debt overhangs, such as rent, mortgages, and credit cards. These payments make direct payments less effective in stimulating aggregate consumption. Another study by Ramey and Zubairy (2018) confirmed the inconclusive size of the multipliers. They found no evidence of large multipliers during the slack state of the economy or when the interest rates are near zero bound. Chetty et al. (2020) also reported consistent results indicating that although the stimulus payments to low-income households increased consumer spending sharply, little of this spending flowed to those businesses most affected by COVID-19 shock, thus lessening the impact of the payments on employment.

The Auerbach and Gorodnichenko (2012) study is among those that confirm that the multipliers are larger in a recession. They found that fiscal policy is more effective in a recession. Lee et al. (2020) used the same methodology and same dataset as Ramey and Zubairy (2018) but introduced a new threshold level. Their estimated fiscal multipliers are significantly more prominent for the high employment state and above unity. Among the developed economies, the U.S. is one of the countries where the spending impact multipliers are more sizable and significant when the output gap is negative than when it is positive (Baum, Poplawski-Ribeiro, and Weber, 2012). Misra, Singh, and Zhang (2020) used an extensive database on debit cards to analyze the changes in consumer expenditure following the stimulus checks. They estimated the aggregate

marginal propensity to consume (MPC) at 0.43. MPC is found to be higher in large urban metropolitan areas with higher rents. This value of MPC is close to the results of the study of the 2008 economic stimulus payments by Parker and Broda (2014). They found that the average partial-equilibrium spending response would be around 30-40 percent of the rebate amount during the first period of disbursement and 20-30 percent during the following quarter, which means that the MPC is between 0.2 and 0.4.

What exactly is the impact of the stimulus checks? From the literature review, we found that several factors impact the effectiveness of the stimulus programs, including average income and the state of the economy. To design a successful economic policy, it is helpful to know the local economy's specific characteristics. Few studies have examined the effectiveness of stimulus checks on local economies. This study estimates the multiplier of the first round of the 2020 stimulus checks, which was paid out in April. We analyze the spending behavior after the individuals received the payments in many counties in Wisconsin and Minnesota by conducting a phone and online survey. The multiplier estimates in a specific region can be useful to accurately reflect the effect of the fiscal policy. Our analysis of the individual spending and stimulus check multiplier can inform local policymakers about the impact of the relief package. The state and local governments can then plan to implement the budgetary support if the federal policy did not work well to stimulate the local aggregate demand.

Our main goal is to estimate the marginal propensity to save (MPS) of residents in different counties in Wisconsin and Minnesota and the multipliers of the stimulus check. We obtain the primary data using the survey method to estimate residents' spending and saving behavior, a method that has been rarely used in recent studies. We found that the average MPS for all individuals is 0.405, or the stimulus check multiplier for Wisconsin and Minnesota is 2.469. One dollar added to an individual's income by the stimulus check creates an additional income of $2.50. When we focused on the multipliers by the size of the counties, we found that the MPS is lower in the smaller towns and thereby a greater multiplier. The counties with small towns in Wisconsin and Minnesota have a multiplier of 2.98 compared to 2.24 in the counties with larger cities. The difference of the MPS between small towns and larger cities is confirmed to be statistically significant. We calculated the multiplier by income level and found that the MPS of the individuals with an annual income lower than $50,000 is statistically lower than the MPS of the individuals with an annual income equal to or greater than $50,000. Therefore, the multiplier effects are greater among lower-income individuals. Our findings are not only consistent with the results from many other studies but also contribute to an understanding of the specific characteristics of the individuals in smaller towns and larger cities in Wisconsin and Minnesota. Our results can also be used by the state or local governments to evaluate the net effects of the pandemic outbreaks and the fiscal policy.

We organize the paper into four sections. The first is the introduction, which includes the research background and literature review. We then explain our data and methodology in the second section. In the third section, we explain our findings and discuss the marginal propensity to save and stimulus check multipliers in counties of Wisconsin and Minnesota. We also separate the multiplier by the gender, the states, the size of the counties by population, and the average annual income of the individuals. The last section provides the conclusion of the study.

2. Data and Methodology

In the US, the first round of stimulus checks was disbursed in mid-April 2020. To estimate the impact of the stimulus checks, we focused on two neighboring states of the upper Midwest region: Minnesota and Wisconsin. We collected data from 25 counties: Ashland, Bayfield, Burnett, Dane, Douglas, Iowa, Iron, Jefferson, Milwaukee, Sawyer, Washburn, and Waukesha in Wisconsin, and Aitkin, Anoka, Carlton, Cook, Dakota, Hennepin, Itasca, Koochiching, Lake, Pine, Ramsey, St. Louis, and Washington in Minnesota. These counties are located either at the northern part of the states or in areas surrounding the state capitals. Almost half of these counties represent smaller towns and rural areas whereas the other counties are home to larger cities. (A map of the surveyed counties is presented in the Appendix.) According to the US Census Bureau (2020), the population of the Wisconsin counties is 2.13 million and the Minnesota counties is 3.22 million.

We developed a survey questionnaire to collect information from these 25 counties. Individuals were asked about their location, gender, annual income, household size, if they had received a stimulus check, how they planned to use the check amount, and what percentage of the stimulus check they planned to save. One limitation of the survey is that it did not collect information on the exact size of an individual's stimulus check. Data were collected using two formats: online and phone. The online survey was conducted using social media platforms. For the phone survey, we used ReferenceUSA, a database of contact information of consumers. We randomly chose individuals from that database for the phone survey. Almost 53 percent of the data was collected through the phone survey.

During six weeks of June-July 2020, we received 226 survey responses. Due to the hardship many people have been facing during the pandemic, responding to the phone or online survey is not their priority. Further, pandemic-related uncertainties make individuals reluctant to share information about their spending/saving behavior. These are some of the caveats of data collection from primary sources during a pandemic.

3. Results and Discussion

In our sample, 52 percent of the observations are from Minnesota and the rest are from Wisconsin. Of the survey respondents, 71 percent are female, and 29 percent are male. The average household size of the respondents is 2.46, and one-third of the respondents have young dependents. By the time the data was collected, 83 percent of the respondents had received their stimulus checks. Of those who received the stimulus checks, about 52 percent decided to use it for paying various types of bills, paying for groceries, making payment for their rent/mortgage, and giving to a charity; 16 percent planned to pay off various kinds of debts/loans; 19 percent opted to save; and the rest planned to use it for other reasons. Table I shows the distribution of their decisions.

Paying bills and depositing the check in a savings account are the most frequently chosen options and were almost equally selected by the surveyed individuals. Interestingly, both spending and saving the stimulus checks were priorities, as shown by the second column (All) of Table 1. Paying for groceries was the third most frequently chosen option. Even during the difficult times of the pandemic, the altruistic option of charity was chosen almost 9 percent of the times.

According to the survey response, of all types of debts and loans, most respondents chose to make credit card payments.

The ranking of the options differs depending on the gender, location, and annual income of the individuals. Among male respondents, the most chosen use of the stimulus checks was putting it in a savings account followed by paying bills and paying for groceries. On the other hand, female respondents chose to pay bills more than putting money in a savings account. Location-wise the difference in uses of stimulus check is more noticeable. The most chosen use of stimulus checks was paying for groceries by individuals living in smaller town counties and putting it in a savings account by individuals of larger city counties. The use of stimulus checks varied when the income of individuals is considered. Individuals with annual income less than $50,000 mostly chose paying bills and paying for groceries while individuals with higher income opted to put it in a savings account. It should be noted that individuals can save in other ways, e.g., 401k, stocks, etc., which were not captured separately by the survey. However, some individuals could have chosen the 'Other' option to report those other ways of savings. The survey did not differentiate those individuals. Interestingly, 'Other' was the third most chosen option by individuals living in larger city counties and individuals earning $50,000 and more annual income.

Table I: Use of the First Stimulus Check in 25 Counties of Minnesota and Wisconsin

(Percentage of Individual Count*)

		Gender		Location		Annual Income of Individual	
Use of Stimulus Check	All	Males	Females	Larger city counties	Smaller town counties	<$50,000	$50,000 & more
Pay bills	19.14%	17.82%	21.01%	17.92%	20.00%	24.48%	14.84%
Put it in a savings account	18.83%	21.78%	18.07%	24.28%	12.41%	13.02%	26.45%
Pay for groceries	15.43%	15.84%	15.55%	10.40%	21.38%	20.83%	7.74%
Pay off credit card debt	10.80%	10.89%	10.08%	10.98%	10.34%	8.33%	12.26%
Other	9.57%	4.95%	10.50%	11.56%	7.59%	6.25%	12.90%
Pay rent/mortgage	8.64%	7.92%	8.82%	8.67%	8.97%	13.02%	3.23%
Donate to charity	8.64%	6.93%	9.66%	8.67%	8.97%	6.77%	11.61%
Don't know	4.01%	6.93%	2.10%	1.16%	7.59%	3.13%	4.52%
Pay off other debt	3.40%	4.95%	2.94%	4.05%	2.07%	2.60%	4.52%
Pay off student loan debt	1.54%	1.98%	1.26%	2.31%	0.69%	1.56%	1.94%
Total	100%	100%	100%	100%	100%	100%	100%

*Note: Only those individuals who received the stimulus checks are counted. Individuals who chose multiple options are counted for every option separately.

In economic theory, the effectiveness of a fiscal policy is measured by the multiplier. When a government injects an additional amount into the economy, spending by households increases given their marginal propensity to consume (MPC), which eventually creates additional employment and income in the economy. In this way, government spending has a multiplier effect on the economy. We computed the spending multiplier as (1/1-MPC). According to economic

theory, MPC is defined as the additional spending by consumers using their additional income and can also be computed as (1-MPS), where MPS is the consumers' marginal propensity to save.

The goal of this study is to estimate the multiplier effect of the stimulus check. For this purpose, we collect information on individual's saving and spending generated by the stimulus check. Specifically, we asked what percent of their stimulus check they would save, ranging from none to all. In other words, of the additional amount that an individual received in the form of stimulus check, how much would be allocated as additional savings, which is essentially the individual's marginal propensity to save (MPS), the proportion of each extra dollar of an individual's income that is saved. Data is collected for 0 to 100 percent savings of the stimulus check. For every 10 percent savings range, the number of responses is used to compute the average saving percent or the average MPS. In this study, we calculate the spending multiplier as (1/average MPS).

Based on the survey responses, three types of multipliers are computed: gender-specific, location-specific, and income-specific. We eliminated any observation with missing data from the relevant type of multiplier computation.

Table II shows the gender-specific findings. The second column displays that for all survey respondents of Wisconsin and Minnesota, the average MPS is 40.5 percent, and the corresponding multiplier is 2.47. According to the survey findings, males saved a larger portion (45 percent) of their stimulus checks than females (39 percent). This result implies females spent a more significant amount of their stimulus checks and thereby had a larger impact on the economy through the spending multiplier. Every additional $1 in stimulus check given to the females of the surveyed counties of Wisconsin and Minnesota created an additional income of $2.59. For our sample, the gender difference in average MPS is not statistically significant, which can be interpreted as indicating that there is no difference between the males and the females during the pandemic in terms of saving and spending. A deeper study of the survey data reveals that similar percentages of the females and the males reported that they were adversely affected by the pandemic regarding their employment. Additionally, some spending and saving decisions might be made on a household level than on an individual level.

Table II: Gender-Specific Multiplier in 25 Counties of Minnesota and Wisconsin

	All individuals	Males	Females	Gender-specific difference in average MPS
Average MPS	0.405	0.449	0.387	0.063 (0.328)
Multiplier	2.47	2.23	2.59	
Observations	177	51	126	

Note: The last column reports the z-test result of the difference between the average MPS of the males and the females. The p-value is given in parentheses.

Next, we estimate location-specific multipliers. We evaluate how residents of larger cities in the two states compared to residents of smaller towns. The median population of the 25 surveyed

counties, 40,000, is used as the dividing line between the two types of counties. Any county with less than 40,000 population is home to smaller towns and rural areas. Table III displays the division of counties based on the population size. According to the U.S. Census Bureau (2020), in Wisconsin 7 of 12 surveyed counties, and in Minnesota 6 of 13 surveyed counties have a population of less than 40,000. The average population density in surveyed counties with larger cities is 763 per square mile and in counties with smaller towns is 14 per square mile.

Table III: Population Division of 25 Counties of Minnesota and Wisconsin

State	County Population: <40,000	County Population: 40,000 & more
Minnesota	Aitkin, Carlton, Cook, Koochiching, Lake, Pine	Anoka, Dakota, Hennepin, Itasca, Ramsey, St. Louis, Washington
Wisconsin	Ashland, Bayfield, Burnett, Iowa, Iron, Sawyer, Washburn	Dane, Douglas, Jefferson, Milwaukee, Waukesha

Table IV shows the location-specific findings. The second column displays estimates for all surveyed counties of Wisconsin and Minnesota. Overall, in the 25 counties, the average MPS is 40 percent, and the corresponding multiplier is 2.51. According to the survey findings, the Wisconsin residents saved a slightly larger portion (41 percent) of their stimulus checks than those in the Minnesota counties (39 percent), which led to the Minnesota counties experiencing a higher multiplier effect than the Wisconsin counties. Every additional $1 in stimulus check given to the residents of the surveyed counties of Minnesota created an additional income of $2.57.

The survey findings show that residents of the smaller towns opted to save a smaller portion of their stimulus checks than the residents of the larger cities and thereby had a higher multiplier impact. Every additional $1 stimulus check given to the residents of the surveyed counties with smaller towns of Wisconsin and Minnesota created an additional income of $2.98, whereas residents of the counties with larger cities generated an additional income of $2.24. We find that the difference between the average MPS of the larger cities and the smaller towns is statistically significant. In Minnesota and Wisconsin counties with smaller towns, the supply of housing is limited, leading to high monthly rent/mortgage payments, which raises the spending in smaller towns. Data from the National Association of Realtors supports the relatively high monthly mortgage payments in those counties.

Table IV: Location-Specific Multiplier in 25 Counties of Minnesota and Wisconsin

Location	All counties	Wisconsin counties	Minnesota counties	Larger city counties	Smaller town counties	Location specific difference in average MPS
Average MPS	0.399	0.410	0.390	0.446	0.335	0.111** (0.047)
Multiplier	2.51	2.45	2.57	2.24	2.98	
Observations	185	89	96	106	79	

Note: **p<0.05. The last column reports the z-test result of the difference between the average MPS of the larger cities and the smaller towns. The p-value is given in parentheses.

Table V shows the income-specific findings. From the collected data, individuals' annual income is divided into two broad groups: less than $50,000 and $50,000 & more. According to the U.S. Bureau of Economic Analysis and the Federal Reserve Bank of St. Louis (2021), Minnesota's 2020 per capita personal income was $61,540, and Wisconsin's was $55,487. Based on the FRED data and annual income ranges of the survey, individual annual income of $50,000 is chosen as the cut-off between the lower and higher income groups.

According to the survey findings, lower-income individuals of surveyed counties of Wisconsin and Minnesota saved a smaller portion of their stimulus checks than higher-income individuals of surveyed counties of Wisconsin and Minnesota. People with an annual income of less than $50,000 planned to save 31.5 percent of their stimulus checks, whereas individuals earning $50,000 or more wanted to save 50 percent. As a result, lower-income groups had a higher multiplier impact. Individuals in the lower-income group who received an additional $1 in stimulus checks created an additional income of $3.17. The impact was reduced to $2 when that additional $1 was received by individuals with a higher annual income. Individuals with a higher income usually have higher liquidity and thereby can save more. We find that the difference between the average MPS of the higher-income individuals and that of the lower-income individuals is statistically significant. Provision of stimulus checks to lower-income individuals is beneficial to them as well as to the economy. According to the Minneapolis Federal Reserve Bank COVID-19 dashboard (2020), in Minnesota and northwestern Wisconsin, (which covers most of the counties surveyed by our study), spending of the low-income consumers is reduced by a lesser percentage than that of the high-income consumers in the months after the stimulus checks are disbursed. This finding is supportive of our multiplier results.

Table V: Income-Specific Multiplier in 25 Counties of Minnesota and Wisconsin

Annual income	All income levels	<$50,000	$50,000 & more	Income-specific difference in average MPS
Average MPS	0.40	0.315	0.50	0.185** (0.000)
Multiplier	2.50	3.17	2	
Observations	184	100	84	

Note: **p<0.05. The last column reports the z-test result of the difference between the average MPS of the higher-income individuals and the lower-income individuals. The p-value is given in parentheses.

Additionally, we compare individuals earning less than $50,000 annually to individuals earning $50,000-$75,000 annually. These two income groups likely received the same amount of stimulus checks, but their incomes are different. We find a statistically significant difference in average MPS between these two income groups. It is because of the higher income level of the individuals that changes MPS, not the amount of stimulus checks they received. Furthermore, regression analysis reveals that when only the location and income of individuals are considered, only income has a significant effect on individual's MPS.

4. Conclusion

In March 2020, the COVID-19 virus spread throughout the U.S. To mitigate the spread of the virus, most states restricted out-of-home activities. As a result, the economy experienced a recessionary contraction. To overcome the economic downturn of the lockdown, the federal government disbursed stimulus checks to individuals. This study aimed to find out how the stimulus checks of April 2020 affected individuals' spending and saving behavior and how the check amount impacted the economy at the local and county levels.

To study the multiplier effect of the stimulus check, we surveyed 25 counties of two neighboring upper Midwest states, Minnesota and Wisconsin. We computed spending multiplier using the marginal propensity to save (MPS) from the stimulus check amounts. We found that the stimulus checks generated a higher multiplier effect for the residents of the counties with smaller towns compared to the residents of the counties with larger cities in Minnesota and Wisconsin. The lower-income individuals had a statistically significant lower MPS and thereby a higher multiplier than the higher-income individuals in the surveyed counties. We found no significant difference between the MPS of the males and the females during the pandemic. These findings can be used to help state and local governments craft economic policies. Future studies should include a larger dataset and more information regarding the size of stimulus checks and race.

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Appendix

Figure 1: Map of Surveyed Counties of Minnesota (MN) and Wisconsin (WI)