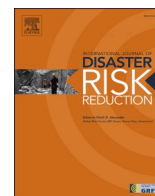


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In the depths of despair: Lost income and recovery for small businesses during COVID-19

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ABSTRACT

This study examined how small business owners sought to keep their businesses operating during the harshest times of the COVID-19 pandemic. The goal of this study was to determine the association between business funding strategies and actions taken by the business to both percent lost income and length of recovery for small businesses in the United States. Businesses that were already experiencing cashflow problems before the COVID-19 pandemic experienced higher income losses. Changing how the business serves customers and being a homebased business were positively associated with percent lost income. Time to recovery was longer when household savings were used to cover business expenses but was shortened when the business owner was a minority. Results provide insights into factors that exacerbated income losses as well as insights into which funding strategies significantly reduced the time to recovery.

1. Introduction

In the United States, small businesses are responsible for 44 % of activity in the United States economy (U.S. Small Business Administration Office of Advocacy, 2019). The economy of the United States relies on small and medium-sized enterprises (SMEs) and these businesses had a great impact on the economy's activity during the COVID-19 pandemic [1]. Recovery from the effects of the COVID-19 pandemic on SMEs may take time. It is estimated that it could take five years or longer for small businesses to recover from the pandemic's economic impacts [2]. Some strategies that SMEs used in response to the COVID-19 pandemic included adopting flexible human resources strategies, increasing product diversification, exploring new markets, increasing learning or knowledge, and having a formal crisis plan [3–5]. Other strategies used by businesses impacted by the COVID-19 pandemic included improving online marketing techniques, product delivery procedures, new product development, cost and pricing strategy during the pandemic, better customer database management, and the implementation of other funding strategies [6]; Thorgren & Willams, 2020). Some of these business model changes have been shown to increase the probability of recovery [7].

The first phase of the Small Business Pulse Survey (SBPS) revealed that small businesses were ubiquitously struggling with business finances and other operations, not excluding cashflow and revenue [8]. The first time that business owners were polled in mid-May of 2020 [8], roughly a third responded that they did not think that their business would resume normal operation and status for more than six months. However, over iterations of the SBPS, the national expected recovery index showed that almost all sectors expected a shorter recovery period as the pandemic progressed (measured between April 2020 and April 2022) [9]. In early April of 2021, the

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Center for Disease Control (CDC) recommended that fully vaccinated individuals could travel at a lower risk [10]. As of May 2021, when vaccines were available for adults and adolescents ages 12–15 years [10], the [11] noted that smaller businesses continued to be financially vulnerable related to carrying debt, even with government programs such as the Paycheck Protection Program.

The COVID-19 pandemic and its related closures (e.g., government-mandated, closure due to employee illness, or closure based on a private business owner's decision) necessitated a variety of changes, including some drastic changes, to nearly every facet of life. Between March 19, 2020 and April 6, 2020, a stay-at-home order was implemented and extended through May 31st in all but five states (Alaska, Arkansas, Nebraska, North Dakota, and South Dakota) [7]. Business owners and their households were severely impacted or minimally impacted by the pandemic, depending on the health status of owners and family, geographic location, industry [8], number of employees, and how customers are served. When small business funding is somehow interrupted or affected, the household may be relied upon to fill that gap, sometimes having major impact to household finances and resources. During the pandemic, some individuals, families, and businesses fared worse than others. Many small businesses in the United States suffered throughout the worst of the pandemic, while some businesses thrived during and following the pandemic.

Given mixed recovery outcomes from small businesses during the pandemic, this study seeks to investigate factors that contributed to the sustainability of small businesses following the onset of the COVID-19 pandemic in 2020. In particular, we investigate the role of COVID-19 related impacts, cashflow issues prior to the pandemic, actions taken by the business (e.g., changing how they serve customers), and funding or borrowing strategies. Specifically, the primary research question is how these variables have impacted small businesses' percent lost income and length to recovery. Understanding how these diverse factors impacted small businesses during COVID-19 will provide useful insights into effective and optimal strategies to consider during future disruptive events.

2. Literature review

2.1. Lost revenue and recovery during COVID-19

Approximately 50 % of wage earners are employed by small businesses [12]. Despite their contribution to the United States' economy [13], small businesses are often disproportionately and negatively impacted by economic shocks such as natural disasters [14,15]. The beginning of the COVID-19 pandemic was no exception, with small businesses seeing large losses in profit, sales, and employees; losses that often resulted in the closure of the business [16]. Indeed, following the March 2020 state-mandated announcement of the COVID-19 closures, small businesses saw a 40 % decrease in revenue [17]. While some businesses survived this steep decline in income, many did not. The Current Population Survey reported a 3.3 million (i.e., 22 %) decrease in the number of active business owners in the United States from February 2020 to April 2020 [18].

Unique from previous economic shocks, the shutdowns of nonessential businesses, social distancing requirements, and travel restrictions led to very specific costs to some sectors, while benefitting others. For example [19], study of businesses in California found that in the second quarter of 2020, overall sales were down 17 % from the same period in 2019. In addition, businesses in the service industry, which is where many small businesses are found, were disproportionately, adversely impacted by the lockdowns. In particular, revenues in accommodations were down by 91 %. For comparison, clothing and clothing accessory stores decreased revenue by 54.5 % during the same time period. These major drops in such businesses were offset by booms in other industries such as online sales where a 180 % increase was observed (Fairlie & Fossen).

The pandemic had differential impacts on gross sales across race/ethnicity, gender, and educational background of business owners [20]. found that 22 % of small business owners were inactive in April 2020 with disproportionate, negative impacts on African American, Latinx, Asian, immigrant, and female business owners [21]. found that owners with humanities degrees experienced much larger losses than those with STEM (science, technology, engineering, and math) degrees [22]. found that business owners working from home (not necessarily homebased businesses) performed better overall after controlling for industry variations, local pandemic, economic, demographic, and policy factors, as compared to other small businesses during the COVID-19 pandemic.

Using detailed transaction level data [17], showed that a dollar of small business revenue losses led to less than 2 cents of decline in the consumption of owners in the early stages of the COVID-19 pandemic. Hence, while small business revenue declined substantially (about 40 %), small business owners realized only a very modest decline in their consumption. This very modest decline in consumption was driven by the liquidity (or lack thereof) of the households and businesses entering the pandemic, emergency federal programs providing funds, and declines in the opportunity to spend money as expenditures on travel, restaurants, and personal services dropped dramatically [17]. We would expect that businesses that were directly impacted by COVID-19 could have more business income loss.

Thus, we propose Hypothesis 1: *Small businesses with COVID-19 related impacts (the owner testing positive for COVID-19 or the business closing due to the pandemic) will have higher business income losses than other firms without COVID-19 related impacts.*

Cashflow (or liquidity) can be important for the long-term survival of the firm. Bartick et al. (2022) found that small businesses with more than \$10,000 in monthly expenses had only above two weeks of cash on hand available. In addition [23], found that only 39 % of SMEs were increasing their cash balances leading up to the COVID-19 pandemic, which meant the 61 % of SMEs were either already comfortable with their cash reserves or were at risk of running out of money from lack of cash reserves [24]. addressed the cashflow issue by studying bootstrap financing, which is utilizing owner assets to fund a business. They found that entrepreneurs with adequate cashflow from either private or business liquidity were less likely to use bootstrap financing. However, this research did not explore whether less bootstrap financing led to more or less income loss. Based on the previous literature, we would expect that businesses in "survival mode" with more cashflow challenges before the pandemic would fare worse (lose more income).

Thus, we propose Hypothesis 2: *Businesses with cashflow challenges before the COVID-19 pandemic will be more likely to experience higher income loss due to the pandemic than businesses without cashflow challenges.*

Apart from borrowing or receiving grant funds, SMEs often take extreme measures in response to an extreme event, such as the COVID-19 pandemic [25]. Williams (2020) found that SMEs acted quickly in response to the COVID-19 pandemic by deferring investments, reducing labor costs, reducing expenses, and negotiating contracts and terms to maintain liquidity, rather than increase income. Most importantly, these firms were reluctant to increase their debt-to-equity ratio, which would occur with the acquisition of any additional loans. Another informal strategy that is often available to small and family firms is to utilize alternative business funding strategies, such as utilizing household savings to fund the business during times of crisis. While this funding strategy may help keep the business afloat, it also places more pressure on the business-owning household that likely relies on the business income.

Thus, we propose Hypothesis 3: *Using alternative business funding strategies (such as household savings) is associated with increased length to recovery.*

Another source of loan financing could be informal financing from family or friends [26]. suggest that family investors may accept below-market returns; however, social preference may create shadow costs that discourage its use. Despite the many businesses that did not survive during the onset of the COVID-19 pandemic, many businesses were able to survive, with some thriving. Borrowing from family or friends could have a negative effect on small business recovery in the face of the COVID-19 pandemic.

Thus, we propose Hypothesis 4: *Borrowing from family or friends is associated with increased length to recovery.*

While there were several factors that contributed to whether a small business in the United States survived the economic shocks of the pandemic, the federal government played an important role in the survival of many small businesses through the Coronavirus Aid, Relief, and Economic Security (CARES) Act which provided \$359 billion in support of small businesses [27]. The CARES programs created the Paycheck Protection Program (PPP) and Small Business Administration Economic Injury Disaster Loans (SBA EIDL). To qualify for a PPP loan, businesses could not have more than 500 employees and could be any business (including nonprofit businesses veterans' organizations and tribal businesses) (Federal Reserve Bank of St. Louis, 2022). The COVID-19 EIDLs were only available for small businesses, small agricultural cooperatives, and most private nonprofit organizations. Despite the value of the CARES Act and its potential to help small businesses, some research suggests that the CARES programs were underutilized, with one sample of 463 small businesses reporting that only 30 % of the sample applied for PPP loans and only 17 % applied for SBA EIDL [7]. In short, while these programs were helpful for some small businesses, they were not sufficient to combat the economic impact of the COVID-19 pandemic on small businesses. Indeed, to survive, small businesses were required to adapt, though not all adaptations resulted in better business outcomes [7].

Overall, the COVID-19 pandemic disproportionately impacted small businesses, leading to lost revenue and the closure of many of these businesses [12]. However, businesses in some sectors benefited from the pandemic such as delivery/shipping, meat processing, construction, transportation services, and others [28].) Government policies helped some businesses remain operational, but these government programs were underutilized and not sufficient to offset the impact of the pandemic for many small businesses in the United States [7]. Recovery following the onset of the COVID-19 pandemic includes a number of strategies and avenues for small

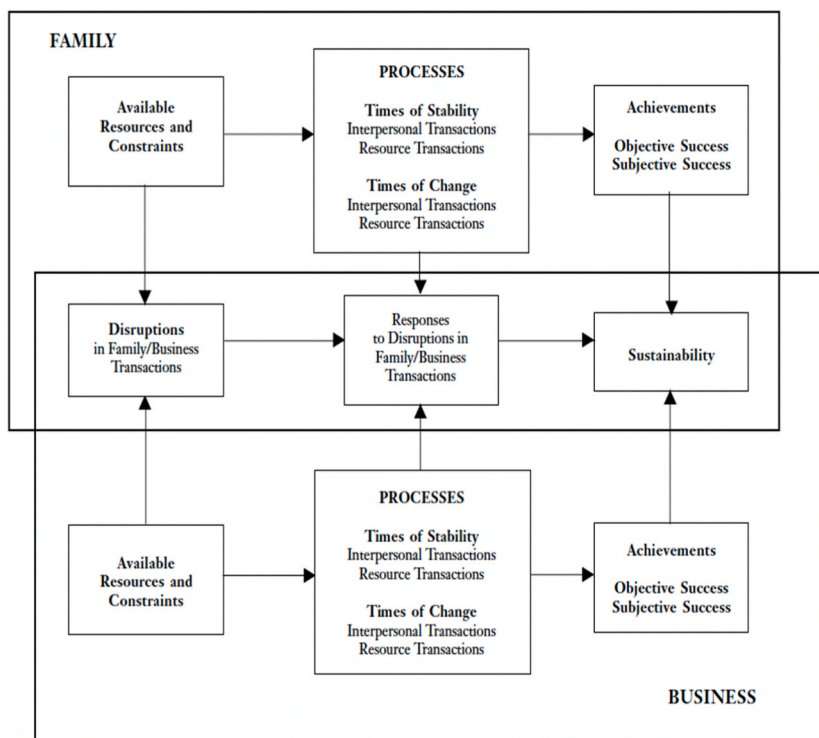


Fig. 1. Sustainable family business model.

businesses to regain their profitability; however, it is likely that this recovery process will take time.

3. Conceptual framework

Utilizing the Sustainable Family Business Model (SFBM) [29] for theoretical reference (Fig. 1, below), we model the outcomes of percent lost income and length to recovery among small businesses during the COVID-19 pandemic. The SFBM examines the family and the business as systems where both systems have overlapping and separate components and processes. The processes that stem from both the family and the business systems change in terms of available resources, constraints, achievements, and disruptions in times of stability and in times of change. The households included in this analysis are business-owning households. Thus, resources, constraints, and disruptions will be experienced and exchanged between the household and the business. Small businesses experiencing a disruption in the form of the COVID-19 pandemic were likely affected across both the family and the business systems. Available resources along with constraints are reflected in the business funding strategies that were utilized by the small businesses, along with the actions taken by the business during times of disruption. The pandemic-related closures mandated for businesses (in most states) along with other mandated or non-mandated closures could affect both the business and the family (household).

The theory of the SFBM [29] has been applied to determine how characteristics and strategies of the business and family systems affect COVID-19 recovery in small businesses, both in length to recovery and percent lost income. We included characteristics of the business and the owner, COVID-19 related impacts, and business funding strategies in our analyses. Some informal business funding strategies included using household savings, crowdfunding, borrowing from family or friends, and selling an asset. More formal

Table 1
Descriptions of variables.

Variables	Description
Dependent Variables	
Length of recovery	number of months that the business will take to recover sales/revenue to the pre-Covid pandemic level
Percent lost income	percent of business income that has been lost due to the Covid pandemic, continuous
COVID-Related Impacts	
Positive for covid	1 if the business owner has tested positive for Covid; 0 otherwise
Days the business closed	number of days that the business closed due to the Covid pandemic, continuous
Business Funding Strategies	
Use household savings	1 if the business raised cash by using household savings for business needs; 0 otherwise
Get a loan	1 if the business raised cash by getting a loan; 0 otherwise
Use a family asset	1 if the business raised cash by using a family asset (such as the family car) for business purposes; 0 otherwise
Borrow from family or friends	1 if the business raised cash by borrowing from family members or friends; 0 otherwise
Crowdfunding	1 if the business raised cash by crowdfunding (such as GoFundMe); 0 otherwise
Sell an asset	1 if the business raised cash by selling a business or household asset; 0 otherwise
PPP or EIDL approved	1 if the business was approved for either the Payment Protection Program (PPP) loan or Emergency Injury Disaster Loan (EIDL); 0 otherwise
Actions Taken by Business	
Close for 24 h	1 if the business closed for more than 24 h due to the Covid pandemic; 0 otherwise
Change how the business serves customers	1 if the business changed the way that they served customers due to the Covid pandemic; 0 otherwise
Change how the business gets supplies	1 if the business changed the way that they got supplies due to the Covid pandemic; 0 otherwise
Increase social media activity	1 if the business increased social media presence and activity due to the Covid pandemic; 0 otherwise
Switch to internet sales	1 if the business changed to internet sales due to the Covid pandemic; 0 otherwise
Characteristics of the Business	
Midwest	1 if the business location is in the Midwest United States; 0 South
Northeast	1 if the business location is in the Northeast United States; 0 South
West	1 if the business location is in the West United States; 0 South
LLC, corporation or partnership	1 if the business is structured as a limited liability corporation (LLC), corporation (S or C Corporation), or partnership; 0 sole proprietor
Retail industry	1 if the business is primarily in the retail industry; 0 otherwise
Tourism industry	1 if the business is primarily in the tourism industry; 0 otherwise
More than one employee	1 if the business has more than one employee; 0 otherwise
Homebased business	1 if the business is a homebased business; 0 otherwise
Direct-to-consumer business	1 if the business is a direct-to-consumer business; 0 otherwise (business to business)
Family business	1 if the business is a family business; 0 otherwise
Cashflow problems before pandemic	1 if the business experienced cash flow problems before the Covid pandemic (in 2019); 0 otherwise
Characteristics of the Business Owner	
Married	1 if the business owner is married or in a marriage-like relationship (living with partner); 0 otherwise
Female	1 if the business owner is female; 0 otherwise
Post-secondary education	1 if the business owner completed at least some post-secondary education; 0 otherwise
Minority	1 if the business owner is a minority race or ethnicity; 0 otherwise (White and non-Hispanic/non-Latinx)
Trusting	scale from 0 to 1 to what extent the business owner trusts: local government, people in their neighborhood, people they work with, people at their church or place of worship, people who work in the stores where they shop, the police in the community, the local news media, people who educate their children, people who provide healthcare services, and the Federal government, where 0 is strongly distrust and 1 is strong trust

business funding strategies included getting a loan and being approved for PPP or EIDL. Actions taken by the business due to the pandemic such as closing for more than 24 h, changing how the business serves customers and get supplies, increasing social media activity, and switching to internet sales were also included.

4. Methods

4.1. Data

The data used are from a nationally representative sample of households in the United States that owned small businesses. In the collection of this data [7], collected a sample of households with the quota that at least 20 % had to be business-owning households. The household sample produced 23 % of households owing businesses, which aligns with the approximately quarter of United States households that own small businesses. The survey was distributed to a sample of 2019 United States adults via a Qualtrics panel in June/July 2020 before COVID-19 vaccines were available but roughly eight weeks after the CARES Act and PPP were passed.

This study was conducted on the sub-sample of business-owning households (23 %) to create a sample of 461 small business owners. According to the Small Business Administration (SBA), a small business is defined as an independent business having fewer than 500 employees [13]. The businesses in our study have less than 500 employees and 25 % of the small business sample analyzed had one or no employees. The survey from which we utilize data examines how households and businesses were affected by the COVID-19 pandemic, including infection, testing, business model changes, and many other topics.

4.2. Variable measures

Variable descriptions and measures can be found in Table 1. In this study, the two dependent variables in regression models are length to recovery in months and percent lost business income due to the COVID-19 pandemic. The COVID-19 related impacts included whether the business owner has tested positive for COVID-19, whether the business was approved for the Payment Protection Program (PPP) or the Emergency Injury Disaster Loan (EIDL) through the Small Business Administration, and the number of days that the business closed due to the pandemic.

As for the business funding strategies, used household savings, got a loan, used a family asset, borrowed from family or friends, and

Table 2
Descriptive statistics ($N = 461$).

Variables	Mean	Standard Deviation
Covid-Related Impacts		
Length to recovery (months)	7.05	8.01
Percent lost income	37.94	29.83
Positive for covid ^a	0.20	0.40
Days the business closed	30.19	44.80
Business Funding Strategies		
Use household savings ^a	0.46	0.50
Get a loan ^a	0.24	0.43
Use a family asset ^a	0.28	0.45
Borrow from family or friends ^a	0.25	0.43
Crowdfunding ^a	0.12	0.32
Sell an asset ^a	0.16	0.37
PPP or EIDL approved ^a	0.27	0.02
Actions Taken by Business		
Close for 24 h ^a	0.51	0.50
Change how the business serves customers ^a	0.64	0.48
Change how the business gets supplies ^a	0.57	0.50
Increase social media activity ^a	0.50	0.50
Switch to internet sales ^a	0.41	0.49
Characteristics of the Business		
Midwest ^a	0.23	0.42
Northeast ^a	0.18	0.39
West ^a	0.23	0.42
LLC, corporation or partnership ^a	0.41	0.49
Retail industry ^a	0.10	0.30
Tourism industry ^a	0.11	0.32
More than one employee ^a	0.75	0.43
Home-based business ^a	0.55	0.50
Direct-to-consumer business ^a	0.73	0.44
Family business ^a	0.40	0.49
Cashflow problems before pandemic ^a	0.55	0.50
Characteristics of the Business Owner		
Married ^a	0.55	0.50
Female ^a	0.52	0.50
Post-secondary education ^a	0.67	0.47
Minority ^a	0.19	0.39
Trusting	0.48	0.28

^a The mean is the percentage of respondents with that attribute per category.

raised cash by crowdfunding were included in the regression models. Further, as for the actions taken by businesses, closed for 24 h, changed the way of providing service to customers, changed the way of getting supplies, and increased social media presence were included in the regression models.

Business characteristics included were regional location (Midwest, Northeast, West, reference category of South), business structure, industry, more than one employee in the business, homebased business, direct-to-consumer business, family business classification, and cashflow problems in the business before the pandemic. Business owner characteristics included marital status, gender, post-secondary education, racial and ethnic minority, and a scale of trust (from 0 to 1) that indicates to what extent business owners trust individuals of their local, regional, and national communities.

4.3. Empirical model

In order to analyze the effects of a number of factors on both percent lost income and length to recovery, a system methods of estimation (SME) approach was employed to conduct this analysis. Namely, a three-stage least-squares regression model (3SLS) was utilized, assuming that the data is both well-behaved and has uncorrelated disturbances. The 3SLS regression allowed for the control of endogeneity in the analysis, with percent lost income and length to recovery being endogenous. The 3SLS model was utilized because we assume that lost income and length to recovery do not move independently. Instead of using separate regressions for lost income and length to recovery, we assume that the two dependent variables move simultaneously, and errors will be correlated.

For our analysis, two equations exist; one to analyze percent lost income and another to analyze length to recovery. The exogenous variables in the equations include COVID-19 related impacts on the business, business funding strategies, actions taken by the business, characteristics of the business (e.g., location, structure, industry, business size, home-based, and cashflow problems), and business owner characteristics (e.g., marital status, gender, education, minority status, and trusting). The “no constant” option was utilized via Stata to force no intercept to be calculated for the system of equations.

Table 3
Three-stage least-squares regression results.

	Percent Lost Income		Length to Recovery	
	Coefficient	Standard Error	Coefficient	Standard Error
COVID-Related Impacts				
Length to recovery (months)	1.66***	0.63		
Percent lost income			0.14***	0.03
Positive for covid	8.83***	2.71	-1.59*	0.82
Days the business closed	0.19***	0.03		
Business Funding Strategies				
Use household savings			2.57***	0.71
Get a loan			0.24	0.78
Use a family asset			0.30	0.72
Borrow from family or friends			-0.23	0.75
Crowdfunding			-1.22	1.00
Sell an asset			-0.75	0.90
PPP or EIDL approved	1.25	2.60	0.32	0.78
Actions Taken by Business				
Close for 24 h			0.16	0.66
Change how the business serves customers	6.09*	3.39	1.45*	0.87
Change how the business gets supplies	1.62	2.80	0.82	0.74
Increase social media activity	-3.65	2.69	-1.06	0.76
Switch to internet sales	2.38	2.67	-1.03	0.74
Characteristics of the Business				
Midwest	-2.65	2.82	1.37*	0.79
Northeast	0.36	3.07	-0.65	0.86
West	-1.81	2.76	0.40	0.79
LLC, corporation or partnership	2.05	2.30	-0.47	0.65
Retail industry	0.98	3.64	0.82	1.04
Tourism industry	3.00	3.39	0.70	0.97
More than one employee	-0.92	2.76	1.00	0.75
Homebased business	6.68***	2.26	-0.50	0.65
Direct-to-consumer business	0.26	2.29	0.45	0.65
Family business	3.87*	2.28	-0.14	0.66
Cashflow problems before pandemic	7.06***	2.35	-0.38	0.68
Characteristics of the Business Owner				
Married	3.23	2.40	0.69	0.65
Female	2.17	2.09	-0.20	0.61
Post-secondary education	0.68	2.16	-0.07	0.63
Minority	3.84	2.90	-1.55**	0.78
Trusting	2.47	3.74	-1.02	1.05
Equation	N	RMSE	"R-squared"	χ^2
Percent lost income	461	21.93	0.79	1674.86
Length to recovery	461	6.28	0.65	770.47

Note: Single, double, and triple asterisks (*, **, ***) denote statistical significance at the 10 %, 5 %, and 1 % levels; respectively.

5. Results

5.1. Descriptive results

Descriptive statistics are shown in [Table 2](#) and include COVID-19 related impacts, business funding strategies, actions taken by the business, and characteristics of the business and business owner. The average number of months that business owners thought it would take them to recover from the COVID-19 pandemic was 7.1 months. On average, respondents stated that they had lost 37.9 % of their business income and had been closed for about 30 days. Yet, only 27 % applied for either PPP or EIDL loans. Many business owners (55 %) stated that their businesses had cashflow problems before the pandemic.

Business owners used various strategies to fund their business during the pandemic. These strategies were not mutually exclusive. Many business owners (46 %) used household savings during the pandemic to fund their business. Business owners also used family assets (28 %) or borrowed from family or friends (25 %). Crowdfunding was used by 12 % of business owners. Other actions taken by business owners included changing how they served customers, their social media and internet activity, and how they got supplies. Sixty-four percent of business owners changed the way they served customers, 41 % switched to internet sales, and 50 % increased their social media activity. Notable, is that all of the forementioned changes undertaken by business owners can be costly in terms of both time and monetary resources, but these actions were often necessary during the pandemic.

In this study, 41 % of businesses were sole proprietors and 75 % were employer businesses. Forty percent were family businesses and 55 % were home-based businesses. Most of the businesses (73 %) were direct-to-consumer businesses and were distributed across a variety of industries. Business owner characteristics included gender, race and ethnicity, education, and marital status. Most of the business owners were women (52 %), married (55 %) and had at least some college education (67 %). Most small business owners were White with only 19 % identifying as a racial or ethnic minority. We also included a scale that measured how much business owners trusted members of their community at the local, state, and federal levels. Business owners who “trust their community” more may have a larger support system to which they can turn to for resources and guidance. For example, if a business owner does not have high levels of trust, they may hesitate to turn to friends/family or their local bank for funding in times of need. A mean score of 0.48 was found for trust on a scale from 0 (completely distrusting) to 1 (completely trusting).

5.2. Regression results

A three-stage least-squares method was used to estimate the factors associated with percent lost income as of July 2020 and how long business owners perceived it would take them to recover. The 3SLS regression results are shown in [Table 3](#). The results indicate that the first three hypotheses were supported. The owner being positive for COVID-19 and the number of days the business was closed due to the pandemic (H1) were statistically significant and increased lost income. Cashflow problems in the business before the pandemic (H2) was also statistically significant and increased lost income. The results show that perceived recovery time for businesses, if the business changed how it served customers during the pandemic, being a homebased businesses or a family business were statistically significant and increased lost income experienced by business owners. The 3SLS regression results for perceived length of recovery show that length to recovery was influenced by percent lost income, the owner testing positive for COVID-19, if the business used household savings to fund the business (H3), if the business changed how it served customers, the business being located in the Midwest, and the owner being a racial and ethnic minority. Borrowing from family and friends (H4) was not statistically significant.

Businesses that had an owner test positive for COVID-19 and were closed for more days lost more income during the pandemic. For every 1 % of lost income, the perceived time to recovery increased by 1.66 months. Businesses with owners who tested positive for the virus lost almost 9 % of income. Being approved for PPP or EIDL did not influence percent lost income or length to recovery. There were many actions that businesses could potentially take to combat the effects of the pandemic, such as changing how the business gets supplies and switching to internet sales. However, the only action that influenced length to recovery and percent lost income was if the business changed how it served customers. This action was linked to more income lost and longer perceived recovery times.

Businesses that lost more income had a longer perceived time that it would take to recover but had a shorter perceived time to recovery when the owner tested positive for COVID-19 (by 1.59 months). Businesses that utilized the business funding strategy of utilizing household savings to fund the business had a longer perceived recovery process by roughly 2.6 months, while no other business funding strategies were statistically significant.

Midwestern businesses had a longer perceived length to recovery, but no other regional control variable was statistically significant for length to recovery or lost income. Home-based businesses lost roughly 6.7 % more income than businesses that were not home-based. Family businesses lost roughly 3.9 % more income than non-family businesses. Not surprisingly, businesses that experienced cashflow problems before the pandemic lost roughly 7 % more income than businesses that did not have cashflow problems. Marital status, gender, educational level, and level of trust that the business owner had did not influence the percent lost income or perceived length to recovery. Minority business owners believed it would take their businesses less time to recover than their White counterparts. Minority business owners, on average, perceived it would take them 1.55 months less to recovery than their White counterparts.

6. Discussion

By utilizing the SFBM as a conceptual model, this study moved the discussion of COVID-19 related impacts from an analysis of actions taken by the small business alone to an analysis of the actions taken by the small business and the business-owning household (in effect, recognizing that the interface between the business and household was important). Previous studies identified important factors, such as industrial sector, race and ethnicity, gender, business size, educational background and others, to assess the impact of the COVID-19 pandemic. This study was also focused on funding strategies to address the challenges posed by the COVID-19 pandemic.

The sources of funding strategies were allocated among those funds supplied by the household, such as use of household savings, use (including selling) of a family asset, and borrowing from friends and family; those funds supplied by the business, such as getting a loan, crowdfunding, and selling other business or household assets; and, those funds supplied by public entities, such as the SBA's PPP and EIDL programs (from the end of March 2020 until the survey collection in June/July 2020). Clearly, the interface between the small business and household was correlated with the percent lost income and time to recovery.

Household-related funding strategies proved to be as influential as business-related funding strategies and more important than public policy strategies (namely, PPP and EIDL programs) in the early months of the COVID-19 pandemic. It seems that the use of household savings was associated with longer perceived time to recovery from the pandemic. Previous research on public funding strategies in response to natural disasters from agencies such as FEMA and SBA found that such assistance can aid in recovery for both households and small businesses [30]. However, during the limited period between when the Cares Act became active (March 2020) and data collection for this study (June/July 2020), the SBA's PPP and EIDL had no impact on percent income lost or perceived time to recovery.

Direct effects and impacts from COVID-19 along with the state of the business during this unexpected disruption cannot be ignored in the analysis. As we expected, COVID-related impacts such as the owner testing positive for COVID-19 and the number of days the business was closed due to the pandemic were associated with higher income losses along with longer perceived recovery times. If businesses had experienced cash flow problems prior to the pandemic (cashflow problems in 2019), then it stands to reason that the business may not be as stable financially. While having cashflow problems in 2019 were not associated with longer perceived recovery times, it was associated with higher business income losses.

These funding strategies (household, business, and public policy based) compete in this analysis. If the goal is to reduce income losses, then focusing on household savings and business loans (from commercial lenders and others) could be important. If the goal is to reduce the recovery time, then focusing on borrowing from family and friends and selling business or household assets could be important. It is crucial to note that while any of these funding strategies could aid in recovery, they may have unintended negative consequences to either the family, the business, or both systems. While it may be easiest to focus on public policy solutions, the most important impacts during the short period of analysis were at the intersection (interface) of the small business and household in this study. A more complete understanding (and analysis) of the impact of the interface may provide an avenue for increasing the impact of public funding strategies.

6.1. Limitations

Due to the timing of the data collection and since the data was collected in the middle of the COVID-19 pandemic in the United States, results and analysis could be limited. While correlation can be interpreted, causation interpretations should be limited to appropriate scope and taken with caution. Recovery time is analyzed in this study is by the business owner during the analysis of this study. While this finding gives us some insights into the extent of the damage that the COVID-19 pandemic had done to the business and family at the time of measurement, it does not account for the damage or recovery that businesses may have encountered while the pandemic continued. Operating businesses were the only status that was included; thus, failed or closed businesses were not surveyed and may have differing results than operating businesses. Finally, demand shifts and varying regulatory controls by state were not employed, other than controlling for region of United States in which the household was located.

7. Conclusion

In times of disruption and in times of change, it would be intuitive for small business owners to search for means of funding and strategies to keep their business open, sometimes without the forethought of consequences. Small business owners, both due to size and resources, can have a different set of funding options for their businesses than larger businesses could have. The SFBM was helpful to understanding the process and exchange of resources that small business owners utilize when facing a major disruption. Some common business funding/cash raising strategies for small businesses are to use household savings for business needs, getting a loan, using a family asset (e.g., a family car or square footage of a family's house), borrowing funds from family or friends, crowdfunding (e.g., GoFundMe), and selling a business or household asset. Notably, business owners having an approved Paycheck Protection Program (PPP) application and/or an Economic Injury Disaster Loan (EIDL) application did not have less income loss or shorter perceived recovery times.

The direct impacts (owner testing positive and days the business closed) from the pandemic were critical components of lost income and perceived recovery time, as was the financial stability of the business before the pandemic took effect (cashflow problems measured in 2019). The findings of this study will allow for publications to be written, targeted to small business owners. These publications can explain the business funding strategies and actions taken by the business to minimize lost business income, and also minimize the time that it takes the business to resume normal operation. These business funding strategies can be further explained, and additional guidance can be given as to how to help small business owners make wise business decisions under times of stress and change.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

The data that has been used is confidential.

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