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Research Report: U.S. Farmers Markets—Essential Business Survival in Disrupting Times

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Abstract

In this paper, we evaluate the impact of COVID-19 on farmers market (FM) sales across the United States during the 2020 operating season using survey responses from 420 market managers. Using a multinomial logit model, we evaluate how certain market characteristics are associated with increased probabilities of market organizations gaining or losing revenue in 2020. We find that SNAP sales changes, market location, and COVID-19 intensity impacted revenue outcomes. State COVID-19 policies for FM and the existence of FM assistance organizations had less of an impact.

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Introduction

The COVID-19 pandemic has had complex and long-lasting impacts on food systems. Supply chain disruptions in the conventional retail grocery business were common in the spring of 2020 (Hobbs, 2020) and continue to reappear. As a result, many consumers started developing alternative strategies for food acquisition. Local foods and direct market channels, such as farmers markets, community-supported agriculture, specialty stores, and produce auctions, were prominent in these new strategies (Ricker and Kardas-Nelson, 2020; Richards and Vassalos, 2021; Thilmany et al. 2021b).

Some farmers shifted their own strategies to take advantage of increased consumer interest in direct sales. Some found new opportunities in retail spaces to fill product gaps. Many also invested in e-commerce platforms and increasingly accepted SNAP (Thilmany et al., 2021a). These adaptations also allowed some farmers to pivot from COVID-19-affected markets, such as restaurants and institutions, while developing relationships to create a broader consumer base.

These pivots to local, direct markets were not always straightforward. Farmers markets, for instance, had to negotiate a constantly changing health policy landscape. Market managers and vendors had to meet criteria set by states and local health departments to operate (Wolnik and Broadway, 2020). Market managers introduced strategies such as structuring the flow of visitors in certain directions, increasing spacing between vendors, increasing online preordering, and reducing entrances and touchpoints. While some markets were closed or operated at a reduced vendor capacity, others experienced increased sales and foot traffic. The experience of different markets and vendors varied by local context (O'Hara et al., 2021).

In this paper, we evaluate the impact of COVID-19 on the revenues of farmers market organizations across the United States during the market season in 2020. We draw from a unique dataset of survey responses from 420 market managers in all 50 states and the District of Columbia. Survey responses were gathered by the Farmers Market Coalition—a national organization that provides technical assistance to farmers markets. We ask, “What market-specific and contextual characteristics predict whether a FM organization gained or lost revenue during the first COVID-19 market season (2020) compared to the previous year (2019)?” Since experiences of COVID-19 in early to mid-2020 were geographically varied, different local characteristics might be associated with patterns of change in FM revenues. Using a multinomial logit model (MLM), we evaluate how certain characteristics are associated with the increased likelihood of market organizations gaining or losing revenue in 2020 compared to 2019.

Methods, Project Background, Survey, and Data

This work is part of a larger Local Food Systems Response to a COVID-19 project that was established in the late spring of 2020. The goal of this project was for 17 national Communities of Practice (COPs) representing different local/regional food sectors to communicate in real time about COVID-19 adaptation strategies. A high-level overview of this project's efforts can be found at lfscovid.localfoodeconomics.com and in Thilmany et al. (2021b).

The Farmers Market Coalition (FMC)—a participating COP in this project—developed and implemented a survey of FM managers across the United States. This post-season survey measured the short-run impact of COVID-19 on markets in late 2020. Market managers were asked about market-specific characteristics, costs incurred to adapt to a new operating environment, market-level changes in revenue as a result of COVID-19, changes in SNAP sales, and changes in market participation by vendors. Survey participants included 420 market managers who completed the survey on behalf of their 8,000 vendors.

The FMC shared the survey with the research team to determine what lessons could be drawn from these initial experiences. Our specific focus is to understand which characteristics of a market organization are associated with gains or losses in market revenue. Because FM organizations rely on vendor sales and consumer participation for operating revenues, their gains and losses act as a proxy for overall market sales. We next describe the multinomial logit model we used to determine how certain market characteristics affect the likelihood of FM revenue changes.

Model

The multinomial logit model is a binary logistic regression that predicts probabilities of possible outcomes conditional on values of explanatory variables (Clark et al., 2019; De España, 2020).

MLM is defined as follows:

$$P(Y = j | X_1, X_2, \dots, X_k) = P(Y = j | K); j=0,1,\dots,J \tag{1}$$

where X_i is the matrix of independent variables of the market j , and β_j is the parameter vector for each outcome. P_{jk} is Prob ($Y = j | K$), and is response probabilities, which is estimated as below in equations (2) and (3) by method of maximum likelihood:

$$P(Y = j | X) = \left(\frac{\exp(x_k \beta_j)}{1 + \sum_{h=1}^J \exp(x_k \beta_h)} \right) = p_j(X, \beta); j=0,1,\dots,J \tag{2}$$

$$P(Y = 0 | X) = \left(\frac{1}{1 + \sum_{h=1}^J \exp(x_k \beta_h)} \right) = p_0(X, \beta) \tag{3}$$

MLM estimates the odds of each category relative to a baseline category as a function of covariates. This method relaxes the assumption of confounder effects when testing for the equality of coefficients (Fujimoto, 2005). In this study, we used a MLM to evaluate what market characteristics predict the likelihood of overall revenue at market j decreasing (0) or increasing (2) compared to our base outcome of staying the same (1) using the following model:

$$F(j, k) = \beta_{0,j} + \beta_{1,j} X_{1,k} + \beta_{2,j} X_{2,k} + \dots + \beta_{H,j} X_{H,k} \tag{4}$$

where $\beta_{H,j}$ is a regression coefficient associated with the h^{th} explanatory variable and the j^{th} outcome. We describe the independent variables used in the next section.

Variables

In the MLM, we chose independent variables that we expected to impact markets' revenue streams. Table 1 describes and provides summary statistics for each variable.

Table 1. Variables Used in the Multinomial Logit Model¹

Variable	Description and Coding	N	%
Outcomes			
Revenue	Market org. revenue decreased (0)	282	67.1
June-August 2020 compared to 2019	Market org. revenue unchanged (1)	39	9.3
	Market org. revenue increased (2)	99	23.6
Independent Variables			
Urban	Urban (1); Rural/suburban (0)	324/96	77.1/22.9
State policy (SP)	State organization developed Covid guidelines for FMs: (1)Yes; (0)No	234/186	55.7/44.3
Formal state association (FSA)	Does a State have an organization dedicated to FM technical assistance? (1) Yes; (0) No	194/226	46.2/53.8
SNAP sales	Market SNAP sales changes from 2020 decreased (0-base); stayed same (1); increased (2)	157/65/ 177	39.4/16.3/ 44.3
VegShare	% of market vendors selling fruits/veg (0) 0%;	101/119/	24/28/
	(1) 1%-25%; (2) 26%-40%; (3) > 40%	110 /90	26/22
		Mean	Std Dev
CovJune	COVID incidence rate for June 2020	7.1	3.9
CovJuly	COVID Incidence rate for July 2020	14.9	10.6
CovAugust	COVID Incidence rate for Aug. 2020	13.9	7.3
Years	# years of market operation	20.2	23.9

Results

First, we discuss some of the descriptive statistics from the survey and other data from the FMC to give context for broader trends in FM during COVID-19. When considering vendor-level data, sales changes from 2019 to 2020 were related to the type of product the vendor was offering. Vendors who predominantly sold produce (58%) and meat and dairy (64%) saw increases in sales (Table 2). Those who sold nonfood or processed products more often had decreases in sales. Thus, product type seems to matter in understanding revenue changes, but other contextual characteristics are important (O'Hara et al., 2021). It is possible that food-oriented markets were

¹ Source: 2020 Farmers Market Coalition Market Manager Survey

more likely to receive the “essential” business designation than markets that were more focused on cultural products and entertainment.

Table 2. Individual Farmers Market Vendor Sales Changes in 2020 Compared to 2019²

	Vendors reporting decreased sales	Vendors reporting increased sales
Fruit and vegetable	1,035	1,433
Meat and dairy	444	786
Value-added products	1,218	797
Flowers	467	342
Artisanal products/crafts	1,409	430

Moving to the market level, managers reported that two-thirds of the farmers markets’ revenue decreased overall compared to 2019 (Table 1). In spite of the general sales slowdown in most markets, there were substantial increases in SNAP sales by market (Table 3). Nearly 40% of markets increased their SNAP sales compared to 2019. Additionally, 28% of the markets used SNAP for the first time during the pandemic. This rise in sales, participation, and markets accepting SNAP may be related to programming specific to the pandemic (Jones, 2021). With a sharp rise in unemployment and closures of in-person schooling, programs such as the Pandemic EBT were implemented to help families meet their food needs (Jablonski et al., 2021). It is worth considering the extent to which farmers markets provided vulnerable populations with an important food outlet during a time of crisis. Using an MLM, we next evaluate how specific market conditions, such as SNAP sales, predict revenue changes for market organizations.

Table 3. SNAP Redemption Changes by Market Organization in 2020 Compared to 2019

	Frequency	Percent
Increased	182	39.5%
Decreased	66	14.3%
Stayed the same	29	6.3%
First year with SNAP	116	27.6%
Did not know	14	3.3%
Did not offer SNAP	21	5.0%

Market Revenue Changes as Predicted by Multinomial Logit Model

Our MLM was designed to determine which market characteristics predict the likelihood of a market experiencing one of three outcomes in revenue. We set the base outcome for our analysis to be “stayed the same” to see whether increases or decreases were comparatively more likely given certain criteria. In the first two results columns, we present the coefficients for each

² Source: 2020 Farmers Market Coalition Market Manager Survey

independent variable and their level of significance. If a variable is significant with a positive coefficient, it is more likely to predict revenue changes corresponding to that outcome. Negative coefficients make the outcome less likely. If a variable is not significant, then it has lower predictive power in either direction (i.e., more or less likely). For instance, the COVID-19 incidence rate in June is significant but negative for the outcome “increased revenue.” We interpret this as meaning markets in states with higher rates of COVID-19 in June were less likely to increase revenue in 2020 than in 2019 when compared to the base outcome of no changes in revenue. To augment this analysis, we also present variables’ marginal effects for each outcome. These marginal effects estimate the extent to which each variable predicts a particular outcome and is calculated across all outcomes.

Table 4. Revenue Changes Predicted by Market-Specific Conditions in a MLM

	MLM Coefficients		Marginal Effects		
	Decreased Revenue (0)	Increased Revenue (2)	Decreased Revenue (0)	No Change (1)	Increased Revenue (2)
CovJune	-0.122	-0.202**	0.005	0.010*	-0.015*
CovJuly	0.087*	0.148***	-0.005	-0.007**	0.012**
CovAugust	-0.100*	-0.146***	0.002	0.008**	-0.010*
State policy	-0.710	-1.045**	0.012	0.057*	-0.069
FSA	0.321	0.318	0.018	-0.023	0.005
SNAP same	-0.027	1.327**	-0.185***	-0.018	0.203***
SNAP Inc.	-0.012	1.025*	-0.127**	-0.013	0.140***
Urban	1.177	0.410	0.183***	-0.073**	-0.111**
Years	0.012	-0.006	0.004**	0.000	-0.003*
VegShare	0.485***	0.518***	0.022	-0.036***	0.014
Constant	1.560	0.898			

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

We begin by considering the temporality of COVID-19. Higher rates in the months chosen for the analysis are predictive of both revenue gains and losses compared to 2019. But the directionality is complex (Table 4). Higher rates in June predict that markets are less likely to increase revenues during the full 2020 market season, according to coefficients. Marginal effects also suggest a higher likelihood of revenues staying the same as the previous year. Higher rates in July, however, predict both positive and negative effects on revenue, likely due to other place-specific contextual factors. For each integer increase in COVID-19 rates (i.e., cases per 100,000 people), the model predicts a 1% increase in the likelihood of a market experiencing revenue increases.

What would explain higher COVID-19 rates predicting revenue increases in July, but no change in June? June rates may have impacted when and how a market could open, but by July, some markets may have already opened and enacted reasonable safety and protocols. These markets may have attracted consumers who were new to FM, possibly because they felt these businesses were safer than retail. Another possibility is that they were tied to increased funding for incentive programs such as P-EBT and SNAP Double Dollars. Finally, lower rates in earlier months may

have also led to less consumer fear for attending markets, especially if markets were perceived to be conscious about safety. Whatever the reason, higher incidence rates during peak market season seemed to predict increased revenue for markets.

Higher COVID-19 rates in August point to a “no change” outcome. This is a similar effect to what was seen in the June incidence rates. Perhaps at this point in the season, new consumers who initially felt uncomfortable at retail stores started shopping at grocery stores more frequently. There could have been a desire to return to a feeling of normalcy or at least being more accepting of “the new normal” and its associated risks. What is noticeable is that the marginal effects for all three market months do not indicate that higher COVID-19 rates were predictive of decreased revenue.

The next set of variables is related to policies and programs. The first variable includes any state policies or recommendations for how FMs could open and operate. Examples of state policies would be capacity limits, social distancing guidelines, and other safety precautions. The existence of state policies was only weakly predictive of decreased likelihood of increasing revenues in the MLM. The marginal effects suggest that the existence of state policy is related to a 5% increase in the likelihood of no change in revenue. These data suggest that formal state policies for market operation did not have much impact on revenue changes. Similarly, the existence of formal state associations for FMs did not predict losses or gains. Formal state associations are organizations dedicated to providing technical assistance, resources, and support to FMs, the existence of which we thought might improve revenue outcomes for FMs.

What could explain the minimal impact of formal state policies and state policies on revenue changes? Perhaps localities and individual markets developed operating standards that were more influential than state-level directives. Market managers know their local market landscapes in greater detail than entities operating at the state level. Another factor may be that local health departments were given more responsibility for enacting standards. At the same time, the relative lack of change in revenue is not a negative outcome. Formal state policies and state policies may have created the conditions for markets to operate efficiently in an extremely adverse crisis to the point where revenue could rise to a similar revenue level as the previous year. Additionally, as we are only measuring markets that opened during the 2020 season, we cannot account for the impact of strict standards that limited the opening of markets. For FMs that did open, state guidelines and formal associations had little impact on predicting revenue gains or losses.

SNAP sales is another policy/program variable of interest given the expansion of benefits during COVID-19. In the MLM, markets with no change or increases in SNAP sales predicted an increased likelihood of overall revenue increases compared to markets with decreased SNAP sales. The marginal effects reinforce this perspective to a greater extent. Here, markets with no change or increases in SNAP sales were 20% and 14% more likely to have an increase in overall revenue, respectively. In short, SNAP sales had an impact on the overall revenue of markets.

The final variables we consider are specific market attributes. Markets in urban locales had an increased likelihood of falling into a decreased revenue category by 18%. This result was expected,

because densely populated locales experienced higher levels of COVID-19 during the summer of 2020, potentially more stringent local regulations for opening, and more spatial challenges to enacting social distancing measures. Next, markets with more years of operation seem to be more likely to experience decreased revenue, suggesting that markets with well-established operating protocols and structures faced different challenges in adapting to COVID-19 compared to newer markets. Finally, markets with a higher percentage of vendors that focus on fruit and vegetable sales were more likely to experience either increases or decreases in revenue. This bifurcated result indicates again the complexity of markets' experiences of COVID-19.

Discussion and Conclusions

COVID-19 had a complicated impact on how markets could operate and who was able to persist in a drastically altered market environment. Despite many markets (i) receiving an essential business designation, (ii) offering an important outlet for SNAP recipients, and (iii) creating a safer food purchasing experience than retail, two-thirds of markets surveyed reported revenue decreases. To say that COVID-19 was impactful to the fortunes of farmers markets would be an understatement.

However, some markets saw revenue increases. From our analysis, these increases are be associated with certain contextual and market characteristics. In particular, increased SNAP sales were significant to the overall revenue of a market. While the increase in available funds and beneficiaries might be temporary, markets benefited when they were able to meet food access needs to some degree. With increases in SNAP redemption and beneficiaries during COVID-19, many individuals became market patrons for the first time.

This finding mirrors another broader trend with consumers' increasing willingness to experiment with businesses in local market channels (Thilmany et al., 2021b). The influx of new consumers presents alternative considerations to vendors, but it also emphasizes the importance of markets and other local businesses as food suppliers. Knowing how these new consumers perceive of and interact with FMs is critical to understanding FMs' long-term evolution, and area where state and national market organizations can support markets. By providing valuable technical assistance on emerging market trends and how to best serve new market patrons, formal state associations can facilitate changes that make markets increasingly flexible.

Another takeaway from our data is that specific COVID-19 rates are less important than the mere existence of COVID-19. The pandemic impacted the structure of farmers markets as well as the consumers who attend. For some producers, farmers markets are a complimentary channel to their broader business strategy. In cases where institutional and restaurant sales disappeared, farmers may have used FMs to find new customers. Additionally, while not considered here, many farmers adopted e-commerce strategies to promote their farm brand, facilitate ordering, and achieve social connection while distancing (Thilmany et al., 2021a; O'Hara et al., 2021). Other coping mechanisms, such as online preorders, curbside delivery, pre-boxing, and other distribution logistics may be preferred by some consumers but are very challenging and costly to vendors (Wolnik and Broadaway, 2020). Nevertheless, many farmers adopted these innovations and

integrated them into their FM strategies. Thus, the concept of the farmers market is altered by these shifts. Finally, the impact of COVID-19 on people's fortunes is extremely varied. Some individuals, groups, and sectors disproportionately bore the burden of COVID-19 in food systems (Thilmann et al., 2021b). More exploration of specific characteristics of market vendors and how their position in the food system impacted their ability to adapt to COVID-19 is more critical than ever.

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