

## CAN COVID-19 RECOVERY MEASURE BRIDGE GENDER DIVIDE? EVIDENCE FROM IMPACT OF COVID-19 SURVIVAL FUND ON HOUSEHOLD INCOME IN NIGERIA

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**Abstract:** *In this paper, we assess the impact of the covid-19 MSME survival fund on entrepreneurs' income in southwest Nigeria. A total of 594 entrepreneurs were chosen by gender using a multi-stage selection technique. Cross-sectional data were obtained through structured questionnaire and subjected to propensity score matching (PSM), inverse probability-weighted regression adjustment (IPWRA), and instrumental variable (IV) regression approach to control for possible endogeneity that could arise from the data collection. Enterprise income was used as indicator to estimate the impact of covid-19 MSME survival fund scheme. There was a significant difference in income earned by male and female entrepreneurs due to their awareness and participation covid-19 MSME survival fund scheme. The size of the estimated treatment effect indicates a high improvement in the income outcome of beneficiaries. Findings show that age, entrepreneurial experience, access to credit and extension services, and number of years live in the community have statistically significant correlations with male and female entrepreneurs' participation in the covid-19 MSME survival fund scheme. Gender-sensitive policy and regulatory frameworks (together with their implementation) are essential for bridging the gender gap and encouraging female entrepreneurs to participate in programs that will help them grow their businesses and earn more income.*

**Keywords:** COVID-19, gender, impact, income, micro small and medium enterprises, entrepreneur, pandemic, survival fund

**JEL Classification:** L26, R28, R51

### 1. Introduction

The COVID-19 pandemic has sparked what could be the most serious worldwide health and economic crisis in human history. Many households and businesses around the world were caught off guard and unprepared for the pandemic's associated shocks since it had not been predicted. In Africa south of the Sahara, countries have rushed into action in an attempt to create containment methods and a long-term solution to stem the spread of the ravenous virus, but no treatment has yet been discovered. The virus's ongoing existence had consequences for the nation's employment rate, household income, and food security. Many people, notably micro, small, and medium entrepreneurs, lost their employment, saw their income collapse, faced significant food shortages, and had trouble accessing markets and hospitals during the covid-19 pandemic lockdown. Prior to COVID-19, Nigeria, for example, had an employment rate of 85 percent. Nigeria's self-reported employment rate fell to 43 percent after the lockdown measures were implemented. Nigerian employment increased to 71 percent in June and 82 percent in July as a result of the Nigerian government's several efforts to minimize the economic impact of the Covid-19 lockdown (CMI Report, 2020).

Nigeria was one of the first countries in Sub-Saharan Africa to detect COVID-19 (coronavirus) cases, and it has taken stringent efforts to prevent the virus's spread. At the same time, following the global pandemic's spread, oil prices plunged by 60%. Because the oil sector generates the majority of Nigeria's government revenue, the drop in prices has far-reaching consequences for the country's economy (World Bank, 2020). The federal government is faced with the dual difficulty of combating the pandemic's public health crisis while also attempting to support a faltering economy. Given rising indications that the twin crises will have severe social and economic consequences, the government is stepping up policy initiatives that can assist alleviate these negative consequences. Preventing poverty from deepening and increasing in Nigeria requires mitigating the effects of the COVID-19 crisis; prior to the crisis, approximately 4 in 10 Nigerians were living below the national poverty line, and millions more were living just above it, making them vulnerable to falling back into poverty when shocks occur (World Bank, 2021).

The COVID-19 pandemic poses a major threat to rural livelihoods by impeding women's and men's participation in economic activities such as farming, processing, trading, and labour. There is a considerable wage disparity between the sexes due to gender discrepancies in the commercial and non-commercial spheres, with women being paid less than males. Although the gender gap in labour income has shrunk in recent decades, it still exists, with considerable gender discrepancies among the population's least educated (Urquidi et al., 2020). Women in rural areas are more vulnerable than men because they have less productive inputs, markets, and financial, extension, and information services. Rural women's ability to engage as decision makers in the design and implementation of response and mitigation plans is often limited by sociocultural norms and gender roles. Women and men must be equally represented in decision-making in order for their individual goals to be considered and shaped in development efforts, policies, and programs. Most decision-making organizations established in response to the pandemic are dominated by men, according to a new worldwide quick gender study on COVID-19 (CARE and IRC, 2020). Women and girls, as well as their organizations, are frequently excluded from community-level decision-making and governance structures that determine humanitarian response methods (IASC, 2018). Women are more likely than men to work in low-wage, precarious jobs, which are particularly vulnerable during economic downturns (IASC, 2020). Institutional safeguards such as social insurance, pensions, and health insurance are not available in these types of jobs, leaving rural women vulnerable in the event of illness or unemployment. In order to contribute to the development of appropriate policy responses and to help lessen the effects of pandemics like Covid-19, this research should have a gender focus (Wenham et al., 2020). Also, except from this study, little is known about the economic effects of Covid-19 on gender equality, although the facts suggest that the impact of the pandemic will affect women and men differently. In addition, gender must be considered in this research to ensure that existing inequalities are not exacerbated, as has been the case in prior pandemics (Lozano and Garca-Calvente, 2020).

The Covid-19 outbreak has caused widespread panic and disruption in the business world. Because of their small size and limited resources, micro, small, and medium companies (MSMEs) are often the hardest hit. MSMEs are particularly vulnerable to the pandemic because they lack the ability to absorb shocks. The pandemic is seen as a threat to MSMEs' survival in Nigeria, as well as around the world. While the crisis has had a significant health impact, it has also had a significant economic impact, particularly on small businesses (Sipahi, 2020). Micro, small, and medium enterprises (MSMEs) are a key determinant of a country's socioeconomic growth and development, as they contribute significantly to the Nigerian economy. MSMEs employ 59,647,954 people in Nigeria,

according to the National Bureau of Statistics (NBS) (2019). MSMEs play an important role in a country's socioeconomic development since they have a high potential for job creation, contribute significantly to GDP, aid in economic diversification, and improve indigenous technical development, among others (Eze, Oladimeji & Fayose, 2019). Following the outbreak of the COVID-19 pandemic, the Nigeria government has established a survival fund which is a conditional grant to support vulnerable micro and small enterprises to meeting their payroll obligations and safeguard jobs. The country's reserves have taken a hit, with oil revenue, the country's main source of income, plummeting as world prices plummeted. The pandemic has also spurred on government talks on ways of diversifying the economy to ensure continued growth. Nigeria's federal government adopted the \$5.9 billion (N23 trillion) Nigerian Economic Sustainability Plan in July 2020 to solve the pandemic's economic difficulties. The plan, which would cost about 1% of GDP, aims to boost and diversify the economy, keep and create jobs, and provide stronger protections for the poor. Clean energy, agriculture, and infrastructure are all part of the recovery strategy (WRI, 2021).

The Economic Sustainability Plan also contains a National Medium, Small, and Micro Enterprises (MSMEs) Survival Fund to mitigate the economic impact of COVID-19 and foster the growth of small enterprises. MSMEs constitute the backbone of the Nigerian economy, accounting for almost 48 percent of the country's GDP. There are about 37 million MSMEs in Nigeria. COVID-19 has severely hampered MSMEs in Nigeria, with many of them either laying off employees or closing their doors. The MSME Survival Fund would support to the private sector in order to help diversify the economy, with a special focus on women. Sixty percent of the MSME Survival Fund has been set aside for women entrepreneurs, who account for at least 41% of the country's microbusinesses (NBS, 2020). While several studies have looked at the impact of the COVID-19 pandemic on global and national economic indicators such as global poverty, government interventions, GDP growth, budget deficits, and employment (ILO 2020a; ILO 2020b; Nicola et al. 2020; Sumner et al. 2020; UN-Habitat and WFP 2020; World Bank 2020), little is known about how the COVID-19 pandemic and associated government economic policies affected household income of entrepreneurs at a local level. As a result, it's vital to understand how the MSME survival fund program influences and supports methods that may be employed to ensure that enterprises continue to earn revenue. This paper adds to the growing body of knowledge on the impact of government action (MSME survival fund post COVID recovery strategies) in lessening the impact of the COVID-19 pandemic and the accompanying lockdown restrictions in Nigeria, as well as the consequences for other economic sectors. These interventions will undoubtedly aid in the empowerment of women and the closing of the gender gap, as well as the reduction of income inequality, the promotion of gender equality and equal representation, and the construction of a more equitable Nigeria (WRI, 2021). In this context, the purpose of this study was to look into the impact of the MSME survival fund as part of the Covid-19 recovery scheme on income of male and female entrepreneurs in southwest Nigeria.

### **1.1. Overview of Nigeria's Sustainable Covid-19 Recovery Plan (MSMEs Survival Fund)**

The Economic Sustainability Plan (ESP) is Nigeria's response to the COVID-19 pandemic. The Scheme is a conditional grant designed to help vulnerable micro and small enterprises meet their payroll responsibilities and protect jobs in the MSME sector from the impact of the Covid-19 pandemic. The scheme is estimated to save not less than 103 million jobs across the country and specifically impact on over 35,000 individuals per state. The Survival Fund's goals are to: stimulate direct local production in the 36 states of

the Federation and the Federal Capital Territory (FCT) by providing funds to MSME's in the production sector to stimulate 'post COVID lockdown' off-take products; supplement payroll obligations of businesses in the health, production, education, hospitality, and food production sectors; and provide 50,000 Naira grants to an additional 100,000 MSMEs who are eligible. As a result of the scheme, about one million, seven hundred thousand (1,700,000) jobs are predicted to be saved. Grants are also available to self-employed individuals, including bus drivers, taxi drivers, ride-share drivers, and artisans like as electricians and plumbers, among others, with a special focus on 45 percent female-owned MSMEs and 5% MSMEs with special needs (i.e the scheme made compulsory female inclusion and achieved a female participation of 42% and male participation of 58%. There was a 5% quota for artisans with disability, while the total number of registrations for artisans with special needs made up 1%). Despite the multiple challenges that the COVID-19 pandemic has posed to MSMEs, they are critical to Nigeria's economic progress. Micro, small, and medium enterprises (MSMEs) are global engines of social and economic change. With 41,543,028 businesses, SMEs contributed 49.78 percent of Nigeria's Gross Domestic Product (GDP) in 2017. MSMEs have made important contributions to the production of wealth and the betterment of Nigerian inhabitants' socioeconomic conditions, according to the MSMEs report (2017). According to Ifekwem and Adedamola (2016), MSMEs contribute to the Nigerian economy in the following ways: mobilization of local resources, employment opportunities, equitable income distribution, raw material services, mitigation of rural-urban drift, generation and conservation of foreign exchange, and industry distribution.

## **2. Methodology**

**2.1. The study area:** This study was carried out in Nigeria's south-western states. Because it is the epicenter of the COVID-19 in Nigeria, this location was chosen for this study. Ekiti, Lagos, Ogun, Ondo, Osun, and Oyo are the six states that make up the region. The region is located between latitudes 6° N and 4° S, and longitudes 4° W and 6° E, and covers an area of approximately 114, 271 km<sup>2</sup>. South-western Nigeria receives an average annual rainfall of 1,200 to 1,500mm, with mean monthly temperatures ranging from 18 to 24°C during the rainy season and 30 to 37°C during the dry season (Adepoju et al., 2011). Due to the area's fertile alluvial soil, this part of the country is largely agrarian. Cassava, maize, yam, cocoyam, cowpea, vegetables, and cash crops such as cocoa, kola nut, rubber, citrus, coffee, cashew, mango, and oil palm are among the notable food crops grown in the area. The study population included all of the region's rural farming households.

**2.2. Sampling procedure and sample:** A three-stage sampling technique was employed in the selection of respondents used for this study. The first stage involved a random selection of 50% of the states in the region (i.e., Ogun, Osun, and Oyo). The list of registered rural entrepreneurs who received MSME survival funds was obtained from the relevant State's Ministry of Commerce and Cooperatives. In the second stage, 3 registered rural enterprise associations were randomly picked from each State, for a total of 9 enterprise associations. In the third stage, 10 rural entrepreneurs (5 male and 5 female) were randomly selected from each of the enterprise association, totalled 270 (135 male and 135 female) respondents (treatment group). Lastly, a total of 108 (54 male and 54 female) rural entrepreneurs who are not MSME survival fund beneficiaries were randomly sampled from each of the selected states making a total of 324 (control group), and totaling 594 respondents for the study.

**2.3. Method of data collection and analysis:** The data was gathered using a questionnaire that has gone through two rounds of pre-testing by field enumerators. Respondents were asked to give their agreement before answering questions presented by enumerators. All respondents were encouraged not to participate in the study if they felt uncomfortable, and to leave at any time during the survey. Every respondent is given adequate information about the study's purpose and the value of taking part in it. The survey instrument was created to gather detailed information on rural entrepreneurs' socioeconomic characteristics, food and non-food expenditures, enterprise income, and MSME survival fund membership. Relevant data on the level of awareness about the MSME survival fund as well as rural entrepreneurs' decision to register for the MSME survival fund were collected. To control for possible endogeneity, the collected data were subjected to descriptive and inferential statistics such as frequency counts, percentages, charts, mean, standard deviation, and propensity score matching (PSM), inverse probability-weighted regression adjustment (IPWRA), and instrumental variable (IV) regression approach.

**2.4. Measurement of variables:** Independent and dependent variables are the variables of interest in this study. The effect of the MSME survival fund on rural entrepreneurs' income is the dependent variable, and it was quantified in terms of actual income from enterprise activities in Naira (₦). The independent variables (rural entrepreneurs' socioeconomic characteristics) were measured as follows (See Table 1):

**Table 1: Description of the variables used in the estimation model**

Variables	Measurement of variables	Category	Expected sign
Participation in MSME survival fund	1 if participated, 0 otherwise	Dummy	+
Age of entrepreneur	Actual age of entrepreneur in years	Continuous	+/-
Gender of entrepreneur	1 if male, 0 otherwise	Dummy	+
Marital status	1 if married, 0 otherwise	Dummy	+
Educational level	Years of schooling	Continuous	+
Household size	Number of people within the household	Continuous	+
Enterprise experience	Number of years engaging in enterprise	Continuous	+
Income	Average annual net enterprise income	Continuous	+
Membership of cooperative union	1 if belong, 0 otherwise	Dummy	+
Access to credit	1 if access, 0 otherwise	Dummy	+
Access to extension	1 if access, 0 otherwise	Dummy	+
Level of awareness of MSME survival fund	Aware=1 and 0=otherwise	Dummy	+
Number of years live in community	Actual years of resident in community	Continuous	+/-
Access to varietal information	Have access=1 and 0=otherwise	Dummy	+

Source: Author's elaboration from field survey (2022)

### 2.5. Estimation strategy

Researchers have been able to refine their knowledge of a causal influence over time by using a conceptual framework that postulates a collection of potential outcomes that could be observed in different configurations of the universe. Establishing the causal effects of the micro, small, and medium enterprises (MSMEs) survival fund on various outcomes of interest among beneficiaries is extremely difficult to do at the individual level due to endogeneity bias, with the exception of science fiction, where parallel universes are occasionally imagined to be observable. As a result, a lot of study has been focused on average causal effects. To make the concept of average causal effect tangible, random assignment of individuals into treatments must control for both observable and unobservable features. Because observed and unobserved features of individuals may

influence the likelihood of receiving treatments and outcome indicators in the absence of random assignment, selection bias may persist. Propensity score matching (PSM), inverse probability weighted adjusted regression (IPWRA), and instrumental variable (IV) regression approaches were employed to mitigate for endogeneity bias due to the cross-sectional nature of our data. PSM works by comparing each treated observation to a corresponding untreated observation, then calculating the average difference in the outcome variable between the two.

The underlying problem with using propensity score matching is that when the propensity score model is mis-specified, the estimates yield biased results (Robins, Sued, Lei-Gomez, & Rotnitzky, 2007; Wooldridge, 2007; Wooldridge, 2010). As a result, we utilized the IPWRA estimator, which combines regression and propensity score techniques to provide some robustness against parametric model mis-specification (Imbens & Wooldridge, 2009; Robins & Rotnitzky, 1995; Wooldridge, 2010). The IPWRA model predicts the following outcomes and treatment scenarios and assume the following liner regression function is the final model.

$$Y_i = \alpha_i + \theta_i x_i + \varepsilon_i \dots \dots \dots (1)$$

*for i = [0 1]*

where,  $Y_i$  = the outcome variable of interest;  
 $x_i$  = a set of controls;  
 $\alpha$  and  $\theta$  = parameters to be estimated;  
 $\varepsilon$  = the error term.

Assume that the propensity scores are computed using  $p(x; \vartheta)$ . In the first stage, we estimate the propensity scores using the formula  $p(x, \hat{\vartheta})$ . In the second stage, we use inverse probability-weighted least squares to estimate  $(\alpha_0, \theta_0)$  and  $(\alpha_1, \theta_1)$  using linear regression:

$$\min_{\alpha_0, \theta_0} \sum_i^N (Y_i - \alpha_i - \theta_i x_i) / P(x, \hat{\vartheta}) \text{ if } I_i = 0 \dots \dots \dots (2)$$

$$\min_{\alpha_1, \theta_1} \sum_i^N (Y_i - \alpha_i - \theta_1 x_i) / P(x, \hat{\vartheta}) \text{ if } I_i = 1 \dots \dots \dots (3)$$

The difference between Equations (2) and (3) is then used to estimate the average treatment effect (ATT).

$$ATT = \frac{1}{N_w} \sum_i^{N_w} [(\hat{\alpha}_1 - \hat{\alpha}_0) - (\hat{\theta}_1 - \hat{\theta}_0)x_i] \dots \dots \dots (4)$$

where,  
 $\hat{\alpha}_1$  = estimated inverse probability-weighted parameters for rural entrepreneur that benefited from MSME survival fund  
 $\hat{\alpha}_0$  = estimated inverse probability-weighted parameters for non-beneficiaries of MSME survival fund.  
 $N_w$  = total number of MSME survival fund beneficiaries.  
 $I_i$  = an indicator which takes a value of one if the rural entrepreneur benefited from MSME survival fund and zero otherwise.

Both observable and unobservable factors impacting rural entrepreneurs' participation in MSME survival funds as well as their income (outcome) must be controlled at the same time to determine and establish a causal effect. In this case, unobservable factor biases may cause estimations from equation (4) to yield biased

conclusions. An instrumental variable (IV) regression strategy was employed to compensate for the potential endogeneity of participation in the MSME survival fund scheme. This potential endogeneity resulting from rural entrepreneur participation in the MSME survival fund scheme could stem from the fact that rural entrepreneurs who participate in the MSME survival fund scheme may be doing so as a result of lost employment, high food insecurity, and difficulties accessing markets and healthcare, all of which are likely to be related to the outcome variable (income) (Chibwana, Fisher, & Shively, 2012; Ricker-Gilbert, Mason, Darko, & Tembo, 2013). The second reason is that rural entrepreneurs that participated in the MSME survival fund program may share socioeconomic characteristics such as access to information, membership in trade associations, and technical and management skills, all of which are likely to be linked to enterprise income. An instrumental variables (IV) regression technique was employed to solve these challenges. As a result, finding an instrument that meets the orthogonality criteria is critical. As a result, a valid binary instrumental variable that satisfies the exclusion limitation constraints, i.e., it must be uncorrelated with the possible outcome other than through the treatment variable, must be utilized. In this study, a suitable instrument must be linked to the entrepreneur's involvement in the Covid-19 strategy of the MSME survival fund while remaining unrelated to the outcome variable (enterprise income). According to recent studies by Abdoulaye et al. (2018) and Shiferaw et al. (2014), access to knowledge about advanced agricultural technology is an effective instrument for its adoption. In this study, entrepreneurs' access to varietal information was used as a criterion for participation in the MSME survival fund's Covid-19 strategy. Access to varietal information is thought to influence rural entrepreneurs' participation in the MSME survival fund's Covid-19 scheme, however this may or may not have an effect on their outcome (enterprise income). As a result, as shown in equation (5), the probit model was employed to complete this estimation:

$$Pr(D_i = 1|X_i, R_i, Z_i) = \Phi(X_i, R_i, Z_i, \psi) \dots \dots \dots (5)$$

where  $D_i$  represents the rural entrepreneurs' involvement or participation in the MSME survival fund scheme which takes the value of 1 if an entrepreneur involved or participated in the MSME survival fund scheme and zero if otherwise;  $Pr$  denotes probability and  $\Phi$  denotes the Cumulative Distribution Function.  $X_i$  represents a vector of socio-economic and plot-specific variables;  $R_i$  is the state-wise fixed effect that accounts for state-level heterogeneity in the participation of rural entrepreneurs in the MSME survival fund scheme;  $Z_i$  is adopted instrument: access to varietal information.

### 3. Results and Discussion

**3.1. Socioeconomic characteristics of respondents:** The descriptive statistics of key socioeconomic variables are presented in Table 2, including the difference in averages between male and female MSME entrepreneurs based on their involvement in the covid-19 survival fund scheme. The mean age of male entrepreneurs in the entire sample was 48.28 years, while the mean age of female entrepreneurs was 48.16 years, as shown in Table 2. When comparing the age of covid-19 survival fund beneficiaries (51.18 years) and non-beneficiaries (45.86 years) among male MSME entrepreneurs, there is a significant difference in age between the two groups. Similarly, at the 1% level of significance, we found a significant difference in age between covid-19 survival fund beneficiaries (46.31 years) and non-beneficiaries (49.70 years) among female MSME entrepreneurs. These data suggest that both categories of MSME entrepreneurs are still in their prime, active, and productive years. The majority of male and female entrepreneurs (80.0% and 87.0%,



respectively) are married, according to the findings. There is no significant difference between the two categories of MSME entrepreneurs in the study area, according to the findings. Furthermore, the majority of MSME entrepreneurs have a post-primary education, with an average of 8 and 7 years of schooling for male and female entrepreneurs, respectively. This shows that MSME entrepreneurs have a high rate of transition to higher education, which explains why the majority of them have completed primary school. The high level of literacy seen among entrepreneurs in the study area corroborates FAO (2013), which claims that middle-aged literacy in Nigeria has been increasing since 1991, rising from 66.4% in 2008 to almost 80% in 2015. It also suggests that education is valued more highly in some parts of the country, particularly in southwestern Nigeria. However, the male entrepreneurs were relatively more educated than their female counterparts. Table 2 shows that in the entire sample, the average household size for male entrepreneurs was 9.23 members and 8.95 members for female entrepreneurs. In comparison, among those who benefited from the covid-19 MSME survival fund, the average household size for male entrepreneurs was 9.06 people and for female entrepreneurs was 8.9 people, therefore there was no significant difference between the two groups. The significant number of household sizes observed in both male and female entrepreneurs would almost certainly offer labour for their business activities, particularly for those who rely substantially on family labour. Furthermore, the average enterprise experience for male entrepreneurs in the entire sample was 14.03 years, whereas the average enterprise experience for female entrepreneurs was 13.98 years. In terms of enterprise experience, there is no significant difference between male entrepreneurs (13.34 years) and female entrepreneurs (13.53 years) who have benefited from the covid-19 MSME survival fund. However, both male and female entrepreneurs had greater experience, and had accumulated enough entrepreneurship experience to assist them overcome business risk over time. This matched the findings of Tsue et al. (2014), who found that the majority of arable crop farmers had more than 10 years of experience. Also, the majority (98.0%) of male entrepreneurs who benefited from the Covid-19 survival fund scheme had access to credit, whereas only 59.0% of female entrepreneurs did. There is significant difference in mean between the two groups at 1%. This shows that entrepreneurs who have signed up for the covid-19 MSME survival fund scheme have higher access to credit than those who have not.

Table 2 showed that about 79% of male entrepreneurs and 87% of female entrepreneurs for the whole sample are members of cooperative societies. To compare the two groups, 88% of male entrepreneurs and 91% female entrepreneurs who had benefited from covid-19 MSME survival fund are members of one association or the other. This difference is also statistically significant at 1%. In addition, more than half of male and female entrepreneurs (66% and 58%, respectively) have access to extension services for the entire sample. We discovered a significant difference at 1% when comparing access to extension services between covid-19 MSME survival fund beneficiaries (81% of male and 38% of female entrepreneurs) and non-beneficiaries (54% of male and 32% of female entrepreneurs). Also, there is a significant difference in awareness of the Covid-19 MSME survival fund scheme between male and female businesses in the entire sample at 5%. In the study area, there was no significant difference in distance to the nearest market between the two groups of entrepreneurs. On a monthly basis, male entrepreneurs that are covid-19 MSME survival fund grantees had an average enterprise income of ₦226,629.63, compared to ₦97,734.57 for non-beneficiaries. Beneficiaries in the female category earned an average of ₦180,762.96, while non-beneficiaries earned an average of ₦42,388.89 a month. This research implies that male entrepreneurs earn more than their female counterparts in terms of enterprise income. On the number of years spent in the



community, there was no significant difference between the two groups. Table 2 also shows that male entrepreneurs had access to varietal information in 73.0 and 44.8% of covid-19 MSME survival fund beneficiaries and non-beneficiaries, respectively, while female entrepreneurs had access to varietal information in more than half (61%) of beneficiaries and only (37%) of non-beneficiaries in the study area. We discovered that male and female entrepreneurs who are beneficiaries of the covid-19 MSME survival fund scheme have better access to the varietal information than those who are not. The difference was determined to be statistically significant at 1%. As a result, having access to varietal information could be a useful tool for enlisting MSMEs in the covid-19 survival fund scheme. According to Issahaku and Abdulai (2019) and Abdoulaye et al. (2018), farmers who are aware of improved agricultural technology and so have access to it are more likely to use it.

### **3.2. Micro, Small, and Medium Enterprises (MSME) engaged in by male and female entrepreneurs**

Table 3 shows that the majority (5.1 and 9.4%) of male entrepreneurs who are beneficiaries and non-beneficiaries of the Covid-19 survival fund scheme are ride sharing drivers, whereas none of the female entrepreneurs are. This suggests that ride-share driving is a male-dominated business. Table 3 shows that 16.6% of male entrepreneurs and 12.5% of female entrepreneurs who benefited from the Covid-19 MSME survival fund scheme engaged in crop farming, compared to 24.1 and 9.3% of non-beneficiaries, respectively. Female entrepreneurs (14.2%) engage in agro-processing operations more than their male counterparts (3.7%) who are recipients of the covid-19 MSME survival fund, according to the findings. This finding implies that in the study area, female entrepreneurs are more involved in processing business. Similarly, in the field of agricultural produce marketing, 6.5% of male and 19.4% of female entrepreneurs benefited from the covid-19 MSME survival fund, while 8.7 and 21.3% of male and female entrepreneurs who did not benefit from the scheme did. Also, among male feed milling entrepreneurs, 2.9% and 3.6% of beneficiaries and non-beneficiaries of the covid-19 MSME survival fund, respectively. Meanwhile, only 1.3% and 4.5% of female MSME survival fund beneficiaries and non-beneficiaries, respectively, sell animal feeds. This indicates that there are more feed millers among male entrepreneurs in the study area, as well as those who have benefited from the Covid-19 MSME survival fund scheme. Similarly, 4.4% and 5.8% of beneficiaries and non-beneficiaries of the covid-19 MSME survival fund scheme are involved in crafting, respectively, while 1.4 and 3.2% of their female counterparts (beneficiaries and non-beneficiaries of the covid-19 MSME survival fund scheme) are involved in crafting. Table 3 shows that the majority of taxi drivers that benefited from the covid-19 survival fund (8.4%) are male entrepreneurs. Table 3 also shows that male entrepreneurs have a higher percentage (15.5%) of beneficiaries of the covid-19 MSME survival fund scheme engaged in poultry/livestock enterprises than female entrepreneurs (5.6%).

**Table 2: Descriptive statistics based on Covid-19 MSME survival fund enrolment**

Socioeconomic variables	Male headed households (N=297)					Mean difference (2-3)	Female headed households (N=297)					Mean difference (5-6)	Total sample Mean difference (1-4)
	Total sample (N=297)	Beneficiaries (N=135)		Non-beneficiaries (N=162)			Total sample (N=297)	Beneficiaries (N=135)		Non-beneficiaries (N=162)			
	1	2		3			4	5		6			
	Mean	Mean	S.D.	Mean	S.D.		Mean	Mean	S.D.	Mean	S.D.		
Age (actual age of entrepreneur in years)	48.28	51.18	11.056	45.86	9.696	5.320** *	48.16	46.31	9.81	49.70	9.865	-3.393***	0.120
Marital status (1=married)	0.80	0.85	0.356	0.77	0.425	0.086*	0.87	0.87	0.341	0.86	0.344	0.002	-0.07
Education (1=literate, 0=otherwise)	7.59	7.12	5.912	6.95	5.163	0.169*	6.88	5.59	4.746	5.54	5.299	0.042	0.710*
Household size (Numbers)	9.23	9.06	2.308	9.36	2.592	-0.305	8.95	8.9	2.159	8.98	2.396	-0.079	0.280
Experience (Years)	14.03	13.34	2.186	14.61	2.782	1.270** *	13.98	13.52	1.888	14.28	2.493	-0.765***	0.050
Access to credit (1=yes, 0=otherwise)	0.95	0.98	0.148	0.56	0.252	0.420**	0.58	0.59	0.495	0.38	0.486	0.209***	0.370** **
Membership of association (1=yes, 0=otherwise)	0.79	0.88	0.324	0.72	0.449	0.159** *	0.87	0.91	0.286	0.83	0.374	0.078**	0.080** **
Access to extension (1=yes, 0=otherwise)	0.66	0.81	0.396	0.54	0.500	0.270** *	0.58	0.38	0.486	0.32	0.468	-0.058	0.08** *
Awareness of MSME survival fund (1=yes, 0=otherwise)	0.59	1.00	0.000	0.25	0.436	0.747** *	0.47	0.87	0.341	0.14	0.35	0.725***	0.120** *
Distance to nearest market (km)	13.83	12.33	3.847	15.09	4.719	2.757** *	12.29	12.19	3.882	12.46	3.869	-0.274	1.540
Income from entrepreneur activities (₺)	15632 3.23	22662 9.63	4633 9.88	9773 4.57	8413 6.82	128895. 06**	1052 86.2	18076 2.96	4410 3.21	4238 8.89	11657. 775	138374.07 4**	51037. 03**
Number of years of residence (years)	26.21	26.37	4.970	26.08	5.522	0.290	25.65	26.53	4.379	24.96	5.905	1.577**	0.560
<i>Instrumental variable</i>													
Access to varietal information (1=yes, 0=otherwise)	0.61	0.73	0.448	0.52	0.501	0.207** *	0.48	0.61	0.49	0.37	0.484	0.237***	0.130** **

**status by gender**

The t-test was conducted to test for difference in socio-economic characteristics between male and female headed entrepreneurs;

\*, \*\*, \*\*\*: Significant at 10, 5 and 1%, respectively.

Source: Field survey (2021)

**Table 3: Distribution of respondents by Micro, Small, and Medium Enterprises (MSME)**

Micro, Small, and Medium Enterprises (MSME)	Male entrepreneurs (%)		Female entrepreneurs (%)	
	Covid-19 survival fund beneficiaries (n=135)	Covid-19 survival fund non-beneficiaries (n=162)	Covid-19 survival fund Beneficiaries (n=135)	Covid-19 survival fund non-beneficiaries (n=162)
Ride share drivers	5.1	9.4	0	0
Crop farming	16.6	24.1	12.5	9.3
Agro-processing	3.7	5.5	14.2	15.5
Produce marketing	6.5	8.7	19.4	21.3
Feed milling	2.9	3.6	1.3	4.5
Crafting	4.4	5.8	1.4	3.2
Taxi drivers	8.4	10.3	0	0
Poultry/Livestock	15.5	12.2	5.6	8.7
Artisan	22.7	14.0	26.2	17.5
Restaurant/food vendor	1.8	0	10.1	12.3
Fisheries/aquaculture	9.3	6.4	2.4	0
Vegetable garden	3.1	0	6.9	7.7

Source: Field survey (2021)

According to the findings, the majority of male and female entrepreneurs who benefited from the covid-19 MSME survival fund are members of various Artisan groups (22.7 and 26.2%, respectively). This shows that the majority of entrepreneurs who took part in the Covid-19 survival fund scheme were affected by the lockdown and restrictions imposed by Covid-19, and because of their small size and limited resources they were the hardest hit. Because they lack the ability to absorb shocks, they are particularly vulnerable to the pandemic. Finally, both male and female entrepreneurs worked in businesses that focused on gender-specific activities, such as restaurants/food vendors, female-dominated vegetable gardens, and so on. These findings imply that the entrepreneurs are involved in a variety of on-farm, off-farm, and non-farm enterprises as a source of income, which helps to alleviate poverty and unemployment in the area. This supports Campaa, Giménez-Nadal, and Molina (2017), who believe that the encouragement of growth through entrepreneurship, the benefits on household welfare, and the decrease of poverty are all arguments for focusing on micro and small firms in emerging economies.

**3.3. Determinants of MSME survival fund scheme among male and female entrepreneurs:** Table 4 illustrates the probit model's maximum likelihood estimates, as well as the average marginal impacts of the covid-19 MSME survival fund on male and female entrepreneurs' enterprise income (outcome). The marginal effect, on the other hand, is more effective than the coefficient at describing the magnitude of a probability model. This is because the sign and amount of the marginal effect determine the direction and degree of the expected effect of socioeconomic variables on their decision to enlist/join or not (Bello et al., 2020). As a result, the marginal effect is used to account for the model's fitness. The model's log-likelihood of -102.05473, Pseudo R<sup>2</sup> of 0.5013, and LR (chi<sup>2</sup>) of 205.16 were all significant (p<0.01), indicating that it has considerable explanatory power and can influence the chance of male entrepreneurs participating in the covid-19 MSME survival fund scheme.

**Table 4: Probit model estimates of determinants of Covid-19 survival fund among male and female MSME entrepreneurs**

Variable	Male		Female	
	Coefficient	Marginal effects	Coefficient	Marginal effects
Age (actual age of entrepreneur in years)	0.031***(0.011)	0.012***(0.004)	-0.023*(0.020)	-0.010*(0.010)
Marital status (1=married)	-0.660*(0.351)	-0.257*(0.135)	-0.298(0.616)	-0.118(0.244)
Education (1=literate, 0=otherwise)	-0.019(0.020)	-0.007(0.007)	0.026(0.042)	0.010(0.017)
Household size (Numbers)	0.109**(0.057)	0.041**(0.023)	0.026(0.112)	0.010(0.044)
Experience (Years)	0.129**(0.059)	0.049**(0.023)	-0.167*(0.114)	-0.066*(0.045)
Access to credit (1=yes, 0=otherwise)	0.001*(0.497)	0.001*(0.189)	0.673*(0.474)	0.261*(0.178)
Membership of association (1=yes, 0=otherwise)	0.213(0.027)	0.079(0.102)	0.165(0.678)	0.065(0.023)
Access to extension (1=yes, 0=otherwise)	0.933***(0.327)	0.326***(0.100)	0.405*(0.413)	0.160*(0.016)
Distance to nearest market (km)	-0.046**(0.027)	-0.018*(0.010)	0.004(0.058)	0.00(0.023)
Awareness of MSME survival fund (1=yes, 0=otherwise)	0.001(1.386)	0.606(0.001)	0.9405***(0.065)	1.565***(0.001)
Number of years of residence (years)	0.036*(0.022)	0.014*(0.008)	0.073*(0.041)	0.029**(0.016)
<b>Instrumental variable</b>				
Access to varietal information (1=yes, 0=otherwise)	-0.114(0.304)	-0.044(0.116)	0.771*(0.428)	0.299*(0.157)
Constant	-3.281(1.289)		-3.292(2.074)	
Number of observations	297		297	
LR chi <sup>2</sup> (12)	205.16		353.55	
Pseudo R <sup>2</sup>	0.5013		0.8639	
Log likelihood	-102.05473		-27.858771	

Source: Author’s computation (2022). \*, \*\* and \*\*\* represent 10%, 5% and 1% levels of significance, respectively. Standard errors are reported in parentheses.

Similarly, among female entrepreneurs, the probit regression revealed a log-likelihood of -27.858771, Pseudo R<sup>2</sup> of 0.8639, and LR (chi<sup>2</sup>) of 353.55, all of which were significant (p<0.01), indicating that the model has a strong explanatory power capable of jointly determining female entrepreneurs' participation in the covid-19 MSME survival fund scheme. Table 4 reveals that eight of the twelve model parameters are statistically significant in influencing the decision of male entrepreneurs to engage in the covid-19 MSME survival fund relief measures. Age, marital status, household size, enterprise experience, access to credit and extension services, distance to the nearest market, and number of years in the community are all socioeconomic factors that have a significant impact on male entrepreneurs' decision to join or enroll in the covid-19 MSME survival fund scheme. Ricker-Gilbert et al. (2011), Chibwana et al. (2012) in Malawi, and Olarewaju et al. (2020) in Nigeria all looked at similar government intervention initiatives and came to similar conclusions. The findings show that the age of male entrepreneurs has a positive and statistically significant relationship with the likelihood of enrolling in the covid-19 MSME survival fund scheme, implying that the age of male entrepreneurs increases the likelihood of enrolling in the covid-19 survival fund scheme by 3.1%. As a result, older male entrepreneurs are more likely than younger ones to engage in the covid-19 MSME survival fund scheme. At the 10% level, the marital status of male entrepreneurs was found to be adversely and substantially linked with participation in the covid-19 MSME survival fund program, meaning that male entrepreneurs were 66.0% less likely to benefit from the covid-19 survival fund scheme. With a value of 5%, the household size coefficient was determined to be positive and significant. Adding a family member boosted the log-likelihood of participating in the covid-19 MSME survival fund scheme by 0.041 unit, according to the marginal effect of the household size variable. This is consistent with Melesse's (2015) observation that high household sizes can assure a sufficient supply of family labour for crop production and the adoption of new agricultural technologies.

Years of business experience boost the likelihood of participating in the covid-19 MSME survival fund scheme, maybe because experienced entrepreneurs have a better knowledge of the benefits of participating in government intervention programs. At 10%, male entrepreneurs who have access to credit facilities have a strong good effect on their involvement in the covid-19 MSME survival fund scheme. This suggests that male entrepreneurs with financing are more likely to participate in the covid-19 MSME survival fund. Many financing institutions (both private and public) that grant credits or loans to individuals employ advisory specialists who educate the borrower on the conditions and other information related to the loans. As a result, these financial institutions may be able to educate entrepreneurs with credit access about the covid-19 MSME survival fund grant. Additionally, entrepreneurs with credit may be encouraged to join in programs that will assist them in expanding their current business. Twumasi, et al. (2019) and Maritim, et al. (2019) for agribusiness youth engagement in Ghana and Kericho County, Kenya, respectively, found a positive link between access to financing and male entrepreneurs. Access to extension was also found to be beneficial, particularly affecting male entrepreneurs' participation in the covid-19 MSME survival fund scheme. This demonstrates that extension agents can provide information on current government policies and programs relating to entrepreneur activities in order to supply them with grants and other incentives. As a result, male entrepreneurs with access to extension services are more likely to participate in government initiatives. Table 4's findings also reveal that the distance to the nearest market is a significant impediment for male entrepreneurs who want to participate in the MSME survival fund. The distance to nearest market variable has a marginal effect of 0.018, meaning that as the distance to nearest market increases, so does the likelihood of participating in the MSME survival fund scheme. This means that entrepreneurs who live far from a community market where information about the covid-19 MSME survival fund and other programs supporting entrepreneurs, such as conditional cash transfer, may easily be received from fellow business owners are less likely to join. Another major factor of participation in government programs like the covid-19 MSME survival fund scheme is the number of years the male entrepreneurs have lived in the town or community. This could be explained by the fact that male entrepreneurs who have resided in a town for a long time are more aware of government policies and programs, and thus have a better chance of participating in them.

Table 4 shows, on the other hand, that seven of the twelve factors utilized in the model specification are statistically significant in explaining the chance of female entrepreneurs enrolling in the covid-19 MSME survival fund scheme. Age, enterprise experience, access to credit, access to extension, awareness of the covid-19 MSME survival fund, number of years lived in the community, and access to varietal information are some of the factors that influence female entrepreneurs' likelihood of enrolling in the covid-19 MSME survival fund scheme. The findings show that, at a 10% level of significance, the age of female entrepreneurs has a negative and statistically significant relationship with enrolment in the Covid-19 MSME survival fund scheme, implying that the age of female entrepreneurs reduces the likelihood of enrolling in the Covid-19 survival fund scheme by 2.3 percent. Female entrepreneurs' likelihood of participating in the covid-19 MSME survival fund plan was shown to be 10% lower as a result of their business experience. This shows that female entrepreneurs with less experience may lack a thorough knowledge of the advantages of participation in government intervention programs. Female entrepreneurs are more likely to participate or enroll in the covid-19 MSME survival fund if they have access to credit. This is due to the fact that having access to credit encourages entrepreneurs to invest more, gives them more purchasing power to acquire productive assets, and allows them to expand their firms. Access to extension was

also shown to be good and strongly associated to female entrepreneurs' participation in the covid-19 MSME survival fund scheme at 10%. This demonstrates the importance of extension services in alerting female entrepreneurs about government interventions for micro, small, and medium-sized businesses in the study area. At the 1% level, the marginal effect and the awareness coefficient of the Covid-19 MSME survival fund scheme are both positive and statistically significant, showing that proper and timely awareness of government assistance would promote its uptake among female entrepreneurs. The amount of years female entrepreneurs have lived in the community is also beneficial and significantly associated with their involvement in the Covid-19 MSME survival scheme, which accounts for 5% of all female entrepreneurs. This means that female entrepreneurs who have lived in a community for a long time are more likely to be aware of government and other development partners' intervention programs, increasing their chances of participating in the program. Finally, the marginal effect and coefficient of access to varietal information are both positive and statistically significant at the 10% level among female entrepreneurs, implying that the instrumental variable adopted has an impact on the likelihood of participating in the covid-19 MSME survival fund program. Entrepreneurs that are aware of government intervention programs are more likely to participate in COVID-19 relief fund measures, demonstrating the usefulness of our instruments, particularly during the COVID-19 epidemic. A previous study yielded similar results (Abdoulaye et al., 2018).

**3.4. Impact of Covid-19 survival fund on MSME entrepreneurs' income (outcome):** Using matching techniques and inverse probability weighted regression adjustment (IPWRA) parameters, the impact of the covid-19 MSME survival fund on the outcome (enterprise income) of male and female MSME entrepreneurs is compared.

### 3.4.1. Propensity Score Matching

Before applying the PSM to evaluate the causal influence of the covid-19 MSME survival fund scheme on male and female entrepreneurs' income, various diagnostic tests were conducted to ensure that the matching procedure was consistent and reliable. To ensure that the variables did not differ, the common support condition was evaluated after generating the propensity score for male and female entrepreneurs. The density distribution of estimated propensity scores for covid-19 MSME survival fund among male and female entrepreneurs is depicted in Figures 2 and 3.

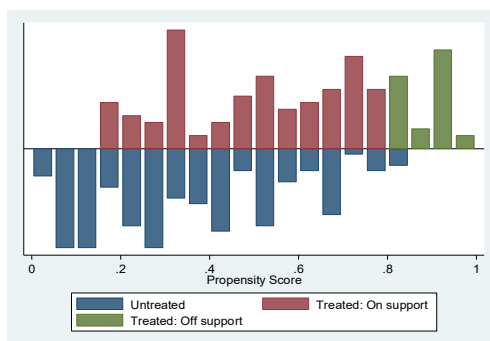


Fig 2. Propensity score matching and common support region for Covid-19 MSME survival fund among male entrepreneurs. Source: Author's computation (2022)

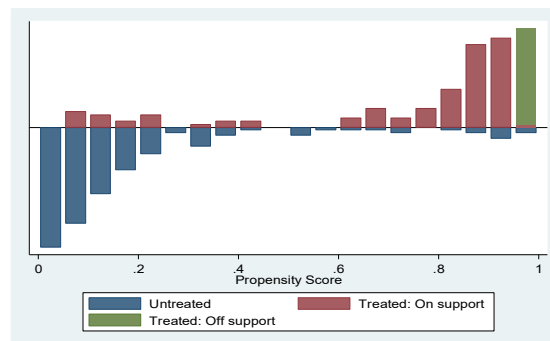


Fig 3. Propensity score matching and common support region for Covid-19 MSME survival fund among female entrepreneurs. Source: Author's computation (2022)

The treatment (male and female entrepreneurs who had benefited from the covid-19 MSME survival fund) and control groups (male and female entrepreneurs who had not benefited from the covid-19 MSME survival fund) have similar characteristics, as shown in Figures 2 and 3. Figures 2 and 3 also show the distribution of propensity scores as well as the common support region for covid-19 MSME survival fund beneficiaries (upper portion) and non-beneficiaries (lower portion) (lower portion). According to a close examination of the distribution of calculated propensity scores, the common support requirement is met, as there is significant overlap in the propensity scores of both male and female entrepreneurs. Because the study reduced selection bias in covid-19 MSME survival fund beneficiaries due to observable variables, any change in enterprise income (outcome) can now be attributed to covid-19 MSME survival fund enrollment. The propensity scores of covid-19 MSME survival fund beneficiaries and non-beneficiaries (treated and untreated) revealed that 89.6% of the male entrepreneurs' profiles were matched, with only 10.4% of the profiles being eliminated, demonstrating the model's applicability (Table 5). Similarly, for both treated and untreated female entrepreneurs, the propensity score of covid-19 MSME survival fund beneficiaries and non-beneficiaries revealed that 89.9% of their profiles matched, while about 10.1% of their profiles fell, supporting the model's fitness.

**Table 5: Distribution of propensity score matching outcome**

Treatment assignment	Male			Female		
	Off support	On support	Total	Off support	On support	Total
Untreated	0	162	162	0	162	162
Treated	31	104	135	30	105	135
Total	31	266	297	30	267	297

Source: Author's computation (2022)

Table 6 shows the unmatched (before matching) and matched (after matching) covariates balancing test estimates. The Pseudo-  $R^2$  indicates the importance of the explanatory factors in defining the probability of male and female entrepreneurs engaging in the covid-19 MSME survival fund scheme. The joint significance of equality in the variables' distribution between covid-19 MSME survival fund beneficiaries and non-beneficiaries was further demonstrated using the p-values of the probability ratio test.

**Table 6: Overall matching quality indicators before and after matching**

Sample		Male	Female
Pseudo $R^2$	Unmatched	0.501	0.947
	Matched	0.067	0.018
LR $\chi^2$ (p-value)	Unmatched	205.16 ( $p > \chi^2 = 0.000$ )	387.59 ( $p > \chi^2 = 0.000$ )
	Matched	193.51 ( $p > \chi^2 = 0.000$ )	291.12 ( $p > \chi^2 = 0.000$ )
Mean Standard bias	Unmatched	42.10	30.30
	Matched	15.70	9.30
% reduction (Bias)		62.71	69.31

Source: Author's computation (2022). Note: \*\*\*significance level at 1%.

Furthermore, results in Table 6 show a significant decline in the value of the Pseudo-  $R^2$  among male entrepreneurs, from 0.501 (50.1%) pre-matching to 0.067 (6.7%) post-matching. According to the likelihood ratio test p-values, the joint significance was accepted for both the unpaired and matched samples (p-value = 0.000). Meanwhile, the



standardized mean bias fell from 42.10 percent prior to matching to 15.7 percent afterward. Matching lowers bias in male entrepreneurs by about 62.71 percent. Table 5 also reveals a considerable decline in the value of the Pseudo-  $R^2$  in the female entrepreneurs' group, from 0.947 (94.7%) pre-matching to 0.018 (1.1%) post-matching. According to the likelihood ratio test p-values, the joint significance was accepted for both the unpaired and matched samples (p-value = 0.000). Also, following matching, the standardized mean bias for covariate variables dropped from 30.30 percent to 9.30 percent. Matching, on the other hand, reduces bias by roughly 69.31 percent among female entrepreneurs. As a result, the reduction in high total bias, significant p-values of the likelihood ratio test after matching, reduced Pseudo-  $R^2$ , and a significant reduction in the mean standardized bias for both male and female entrepreneurs are indicative of successful balancing of the distribution of covariates between covid-19 MSME beneficiaries and non-beneficiaries.

### 3.4.2. Estimation of impact of covid-19 survival fund on outcome variable (MSME entrepreneurs' income)

Table 7 shows the distributional effect of the covid-19 MSME survival fund on the outcome variable (enterprise income) across male and female entrepreneurs using propensity score matching (PSM) and inverse-probability weighted regression adjustment (IPWRA).

**Table 7: Distributional impact of covid-19 survival fund on entrepreneurs' income (outcome) based on PSM and IPWRA**

MSME entrepreneurs	Treatment variable=1 if rural entrepreneurs benefited in Covid-19 Survival Fund Scheme		PSM		IPWRA	
			Coefficient	Robust Std. Err.	Coefficient	Robust Std. Err.
Male	Income from enterprise activities (Naira)	Control	113702.70***	10545.52	103147.90***	8773.928
		Treated	150606.80***	13001.31	128747.30 ***	8482.449
	% impact of covid survival fund <sup>a</sup>		[24.50]		[19.88]	
Female	Income from enterprise activities (Naira)	Control	118627.10***	6127.363	114551.90***	4113.352
		Treated	139558.40***	4043.606	138413.20***	138413.2
	% impact of covid-19 survival fund <sup>a</sup>		[14.99]		[17.24]	

Source: Author's computation (2022), \*\*\*represent significance level at 1%. PSM= Propensity score matching; IPWRA= Inverse probability-weighted regression adjustment.

<sup>a</sup>Denotes the percentage impact of covid-19 survival fund in each of the estimate of MSME entrepreneurs' income. All estimations include set of controls included in Table 3.

The results in Table 7 show that the percentage impact of the covid-19 MSME survival fund on male and female entrepreneurs' enterprise income (outcome) varies between the two estimates. When comparing the PSM to the IPWRA estimates, it was discovered that the percentage impact of the covid-19 MSME survival fund was higher in the PSM among male entrepreneurs, whereas the impact of the covid-19 MSME survival fund was relatively higher in the IPWRA than PSM among female entrepreneurs. This study's findings were interpreted using IPWRA, which appears to be more robust than PSM and may be less prone to selection bias and endogeneity. The findings also demonstrate that for both male and female entrepreneurs, participation in the covid-19 MSME survival fund scheme has a positive and statistically significant effect on the outcome (enterprise income) indicator. Table 7 reveals that in the male entrepreneurship category, participation in the covid-19 MSME survival fund scheme increased enterprise

income by 24.50% and 19.88%, respectively. In addition, the covid-19 MSME survival fund scheme raised enterprise income by 14.99% and 17.24% for female entrepreneurs. Due to their degree of engagement in the covid-19 MSME survival fund scheme, both male and female entrepreneurs appear to have acquired an additional point. However, there is a considerable disparity in the number of level points gained by male and female entrepreneurs, with male entrepreneurs gaining more points. The trustworthiness or reliability of the PSM and IPWRA outputs, on the other hand, is determined by the quality of our matching (Table 5).

Table 8 shows that male entrepreneurs that benefited from the covid-19 MSME survival fund improved their income by 30.1% as a result of the IV-2SLS. Our findings reveal that education, access to credit, and access to extension all considerably increase enterprise income among male entrepreneurs, however the number of years spent in the community has a negative and statistically significant impact on enterprise income at 10%. Table 8 also shows that female entrepreneurs that took part in the covid-19 MSME survival fund initiative saw a 14.2% increase in their enterprise income. Female entrepreneurs' level of education, access to credit and extension services, and awareness of the covid-19 MSME survival fund scheme were all key factors in increasing their enterprise income. This finding agrees with Wossen et al. (2017), who found that GESS participants in Nigeria increased corn production by 26.1%. In addition, Jayne and Rashid (2013) observed that in Sub-Saharan Africa, increased maize output was positively associated with fertilizer subsidies. However, both male and female entrepreneurs record considerable increases in their enterprise income, with male entrepreneurs seeing higher increases than female entrepreneurs.

**Table 8: IV-2SLS estimation of treatment effect on MSME entrepreneurs (income) outcome**

Variable	IV-2SLS (Income)			
	Male		Female	
	Coefficient	Std. error	Coefficient	Std. error
MSME survival fund scheme	0.301*	0.069	0.142*	0.087
Age (actual age of entrepreneur in years)	-0.001	0.002	-0.003	0.003
Marital status (1=married)	0.066	0.062	0.029	0.09
Education (1=literate, 0=otherwise)	0.004*	0.004	0.005*	0.006
Household size (Numbers)	0.004	0.012	-0.004	0.016
Experience (Years)	0.007	0.012	-0.009	0.016
Access to credit (1=yes, 0=otherwise)	0.201**	0.112	0.055*	0.058
Membership of association (1=yes, 0=otherwise)	-0.051	0.057	-0.054	0.085
Access to extension (1=yes, 0=otherwise)	0.637***	0.052	0.059*	0.061
Awareness of covid-19 MSME survival fund (1=yes, 0=otherwise)	-0.033	0.069	0.108*	0.086
Distance to nearest market (km)	-0.016	0.006	0.023	0.008
Number of years of residence (years)	-0.004*	0.004	0.001	0.005
Joint significance of all regressors (F-test)	21.6066***		1.68574*	
R <sup>2</sup>	0.4801		0.1137	
Durbin (score) chi <sup>2</sup> (1)	0.091983(p=0.7617)		0.218936(p=0.6399)	
Wu-Hausman F(1,293)	0.090772(p=0.7634)		0.216146(p=0.6423)	
Wald chi <sup>2</sup> (2)	254.51		1119.88	
Prob>chi <sup>2</sup>	0		0	
R-squared	0.4614		0.79	
Observations	297		297	

Source: Author's computation (2021). \*, \*\* and \*\*\* represent 10%, 5% and 1% levels of significance, respectively.

The level of education coefficient was statistically significant at 10% among male and female entrepreneurs and was associated to their involvement in the covid-19 MSME survival fund scheme. The positive sign of the coefficient corresponds to the a priori expectation, implying that entrepreneurs with a specific level of education are more likely to be aware of the government's MSME intervention program and to have been enrolled in the covid-19 MSME survival fund scheme. This could be due to a flow of information that is hostile to the society's elite yet addresses popular interests. Entrepreneurs with credit are more likely to participate in the covid-19 MSME survival fund scheme, and financial institutions may urge entrepreneurs with credit to participate in initiatives that will help them expand their business. Furthermore, the access to extension coefficient was significant at 1% for male entrepreneurs and 10% for female entrepreneurs, and it had a beneficial impact on their involvement in the covid-19 MSME survival fund scheme. The positive link between access to extension services and male and female entrepreneurs' participation in the covid-19 MSME survival fund scheme could imply that entrepreneurs may benefit from extension contact. This research implies that having access to extension services boosts one's chances of engaging in the government's Covid-19 intervention program. The implication is that having access to extension services allows entrepreneurs to benefit from government assistance.

We also conducted a post estimation test using “estat endogenous” to test the hypothesis that participation in government intervention (covid-19 MSME survival fund scheme) program may be endogenous. Durbin (score)  $\chi^2(2) = 0.091983$  ( $p=0.7617$ ); the robust regression-based test of Wu-Hausman F-statistics  $(1,293) = 0.090772$  ( $p=0.7634$ ) among male entrepreneurs, and for female entrepreneurs, the statistics are: Durbin (score)  $\chi^2(2) = 0.218936$  ( $p=0.6399$ ); the robust regression-based test of Wu-Hausman F-statistics  $(1,293) = 0.216146$  ( $p=0.6423$ ). Furthermore, we rejected the null hypothesis and found that male and female entrepreneurs' participation in the covid-19 MSME survival fund program is endogenous at a 1% significant level, implying that probit estimation might be used to evaluate treatment effect consistency. As a result, the results support the use of the instrumental variable method to calculate the treatment effect. To assess the validity of instruments for both types of entrepreneurs, we used the Stata command "estat first stage." The minimal eigenvalue (21.6066) is greater than the nominal 5% eigenvalue, and the Wald test at 5% bias tolerance and the joint significant test ( $F=18.57$ ,  $p=0.000$ ) suggest that the instruments are strong. Similarly, the minimum eigenvalue (1.6857) in female-headed households is greater than the nominal value of 5%, Wald test at 5% bias tolerance, and the joint significant test ( $F=1.06$ ,  $p=0.000$ ), indicating that the instruments are robust.

#### 4. Conclusion

This study examined the impact of a government intervention program (covid-19 MSME survival fund) to counterbalance the effect of covid-19 on the local economy in southwestern Nigeria using cross-sectional data from micro, small, and medium enterprises (MSME) in the region. To compensate for probable endogeneity that could come from the nature of the data collected, the researchers used propensity score matching (PSM), inverse probability-weighted regression adjustment (IPWRA), and instrumental variable (IV) regression. The matching approach compared male and female entrepreneurs who had benefited from the covid-19 MSME survival fund scheme and came to gender-specific conclusions. Age, marital status, household size, and enterprise experience, as well as access to credit and extension services, distance to nearest market, and number of years resident in community, all have statistically significant relationships with male entrepreneurs' participation in the covid-19 MSME survival fund scheme to varying

degrees, according to the findings. Female entrepreneurs' participation in the government's Covid-19 relief scheme is influenced by their age, business experience, access to credit and extension services, awareness of the Covid-19 MSME survival fund scheme, number of years lived in the community, and access to varietal information. Findings suggest that participation in the covid-19 MSME survival fund scheme improved male entrepreneurs' enterprise income by 24.50% and 19.88%, respectively, using PSM and IPWRA estimates. Participation in the covid-19 MSME survival fund scheme increased female entrepreneurs' income by 14.99% and 17.24%, respectively. Due to their level of awareness and engagement in the government intervention (covid-19 MSME survival fund scheme) program, there was a significant difference in income earned by male and female entrepreneurs. As a result, the impact of the Covid-19 MSME survival fund scheme was felt more strongly by male entrepreneurs than by female entrepreneurs, resulting in a gender disparity in the research area.

Using instrument variable (IV) estimations, male and female entrepreneurs who benefited from the covid-19 MSME survival fund scheme have their income increased by 30.1% and 14.2%, respectively. The implication is that the covid-19 MSME survival fund scheme assisted entrepreneurs in reviving their enterprises and increasing their income, which is a compelling cause for the government to act. Given that the scheme has increased beneficiaries' income in the study area, it was suggested that the Federal Government of Nigeria build on the successes and gains of the covid-19 MSME survival fund scheme by increasing funding and ensuring that more entrepreneurs are captured in the next phase of the scheme, given that the scheme has increased beneficiaries' income. This is because the study discovered that access to credit has a significant impact on entrepreneurs' participation in government programs aimed at revitalizing their businesses, closing the gender gap, and expanding MSME financial markets, all of which would undoubtedly maximize MSME's economic impact. Gender-sensitive policy and regulatory frameworks (as well as their implementation) are critical for closing the gender gap and encouraging female entrepreneurs to participate in programs that will help them grow their enterprises and earn more income. Furthermore, fundamental policy frameworks that will strengthen the scheme, as well as measures by key institutions to rebuild and support the economy, are vital to the MSME's long-term existence. Additionally, increasing access to extension services and credit facilities, particularly among female entrepreneurs, should be pursued and encouraged in order to improve their information source and sustain and expand their businesses. This is because the study found that having access to extension services and credit has a significant impact on entrepreneurs' engagement in government intervention programs and boosted their earnings.

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