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**Economic Assessment of the *Igbo* Entrepreneurship Model for
Entrepreneurial Development in Nigeria: Evidence from Clusters in
Anambra State ¹**

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Research Department

Economic Assessment of the *Igbo* Entrepreneurship Model for Entrepreneurial Development in Nigeria: Evidence from Clusters in Anambra State**Chukwunonso Ekesiobi & Stephen K. Dimnwobi**

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Abstract

Purpose – This study presents an economic investigation of the entrepreneurship practise of the *Igbos* of South-Eastern Nigeria. It is intended to deepen entrepreneurial development and employment generation in the country. This study also provides empirical support to situate the *Igbo* entrepreneurship model (IEM) among existing entrepreneurship literature, particularly for research in developing countries.

Design/methodology/approach – The study adopts a quantitative approach to examine 1187 responses carefully drawn from the Onitsha and Nnewi business clusters in Anambra state. In addition to descriptive demonstrations, the Propensity Score Matching (PSM) technique is employed to estimate the effects of treatment on the treated by pairing treatment and control units with similar attributes on the propensity score and other likely covariates. Specifically, the PSM is used to perform a counterfactual analysis of the effect of the entrepreneurship model on business outcomes by examining participants and non-participants in the IEM.

Findings – The key findings of the study indicate that entrepreneurs who participated in the IEM have higher business survival rate, business growth rate and access to trade and informal credit, while non-IEM entrepreneurs have better access to formal credit source than the IEM graduates.

Research Limitations/Implications – Generalisation of results can be limited since the study is based on responses of samples drawn from two clusters (Onitsha and Nnewi) in Anambra State, South-East Nigeria. The clusters, though situated in *Igbo* land, are not the only *Igbo* business locations in the South-East region and the rest of the country. However, with the larger number of the respondents and synchronisation with existing literature in this subject area guarantee the robustness and applicability of the study findings.

Originality/value – The novelty of this study rests on its pioneering attempt to empirically examine how the IEM can drive entrepreneurial development in Nigeria. We also distil lessons for evidenced-based replication of the model to provide a sustainable employment channel for the country. The study posits, among other things, that the IEM can be a veritable approach for enterprise development and youth employment in Nigeria.

Keywords: *Igbo* Entrepreneurship Model, Business outcomes, Clusters, Nigeria
Paper Type: Research Paper

1. Introduction

The link between entrepreneurship and favourable economic outcomes is well acknowledged (Vracheva and Stoyneva, 2020; Xiong *et al.*, 2018). This nexus largely guarantees a collaborative environment for the advantageous association among relevant actors in the business ecosystem of an economy. Therefore, bolstering entrepreneurial effort and sustainability has popularly become a *sine qua non* for expanding economic performance globally. Despite this, entrepreneurial upshots often differ in magnitude and across countries (Xiong *et al.*, 2018). In budding economies, entrepreneurial adventures have not flourished relative to their developed counterparts, with debilitating consequences for increasing entrepreneurial development and fostering job creation (Agu and Nwachukwu, 2020).

Considering the demographic and economic stance of Africa, the above narrative becomes more compelling. With half the populace below the age of 18, the continent is relatively at the centre of a youth bulge. Also, the region is set to continue as the youngest region globally for decades ahead (Deon and Fox, 2014). While the age disparity in other regions continues to rise, projections by the United Nations (2011) show that the median age in Africa will slightly increase from 21 to 24 between 2035 and 2050. Sadly, most young Africans are without secure job opportunities (AfDB, 2016) and the dilemma of youth unemployment in Nigeria – Africa’s most populous nation and biggest economy – is more bothersome. According to the National Bureau of Statistics (2018), youth unemployment in Nigeria is reported as 55.4% or 24.5 million (11.3 million underemployed and 13.1 million unemployed).

Despite recent employment and empowerment programmes², unemployment in the country persists (Nwokoye *et al.*, 2019) with a low likelihood of business survival (Kehinde *et al.*, 2016; Peter *et al.*, 2018). However, amid the chequered institutional entrepreneurship expansion drive in the country is a traditional entrepreneurial model that has blossomed sustainably (the Igbo Entrepreneurship Model - IEM). The IEM is an enduring practice by the Igbos in the South-Eastern (SE) part of Nigeria. It is popularly described as the biggest and most enduring business incubator in the world (Neuwirth, 2018). Faced with a mounting unemployment question, exploring alternative entrepreneurship development models for Nigeria like the IEM provides new openings for practical solutions.

²Subsidy Reinvestment and Empowerment Programme (SURE-P), the Youth Enterprise With Innovation in Nigeria (YOU-WIN) and the N-Power Programme.

The IEM involves a process of grooming an apprentice through an informal mentor-mentee system. It fundamentally equips skilled, semi-skilled and unskilled beginners with business aptitudes which ultimately boost entrepreneurial development (Agozino and Anyanike, 2007; Obunike, 2016; Igwe *et al.*, 2018b). A notable example of this practice is situated in Onitsha – the commercial capital of Anambra State and home to the largest market in West Africa. Also, in Nnewi and similar business hubs in the SE region, the IEM has continued to stimulate business empowerment. It assists in developing entrepreneurs by raising funds for business and knowledge transfer that drive the expansion of new economic ventures (Obunike, 2016). This entrepreneurship model in similar Igbo Business Clusters in the region has flourished in the face of unemployment and deindustrialisation in Nigeria (Bräutigam, 1997, Ekesiobi *et al.*, 2018).

An empirical exploration of the IEM has not received significant research attention. Related studies (Agu and Nwachukwu, 2020; Alike and Orjiako-Umunze 2019; Igwe *et al.*, 2018b; Obunike, 2016) are limited both in scope and methodology. Specifically, the basis for this study is five-pronged. First, the scope of earlier studies provides room for expansion. This study utilizes large datasets covering Onitsha and Nnewi Business zones - two major business clusters in Nigeria – and uniquely located in Anambra State which is at the heart of the IEM. Second, prior studies on the theme have utilized descriptive, case study and theoretical methods, while this study adds to the literature by providing a robust econometric investigation of the Igbo entrepreneurship model using the Propensity Score Matching (PSM) technique. This guarantees randomization and ensures an unbiased estimation of treatment effect and the control groups. Third, to ensure unprejudiced findings and unlike other studies, both participants and non-participants of the IEM are sampled. Fourth, our model incorporates variables (business survival rate, business growth, business management skills, access to trade credit - formal and informal) omitted by previous studies but have broader implications on the Igbo entrepreneurship system. Finally, this study provides empirical insight into the likely predictors for the seamless adoption of the IEM and distils lessons for evidence-based replication of the model in Nigeria. The main research questions addressed in this paper include: Does the IEM significantly impact business outcomes (business growth, survival and customer acquisition)? What is the impact of the IEM on access to credit? How significant is the IEM effect on business management skills?

Following the introductory section, the next section conceptualises the Igbo Entrepreneurship Model while section three presents a review of the theoretical and empirical literature.

Section four presents the research methods. This is followed by the presentation of results and discussion of findings in sections four and five respectively. Section six contains policy implications and concludes the study.

2. Conceptualising the Igbo Entrepreneurship Model

Apprenticeship is acknowledged historically as one of the oldest methods of transmitting skills and human knowledge. Put differently, it is recognized as a combination of both practical and theoretical knowledge. According to Olulu and Udeorah (2018), apprenticeship is regarded as a means of training people to learn a trade or craft for their future wellbeing and livelihood. Olulu and Udeorah (2018) noted that apprenticeship practice could be divided into three categories which include the traditional, informal, and modern apprenticeship model. Undergoing apprenticeship training further enables the absorption of extensive skills and erudition in a particular trade or craft under the guidance of an expert. The aim is to accelerate the career of an apprentice towards developing into an accomplished tradesperson.

On the other hand, Onuoha (1991) views entrepreneurship as the ability to adequately utilize factors of production – capital, labour and land – to create new goods and services. Anyanwu (2010) and Udofot (2012) similarly explain that entrepreneurship highlights the supremacy of eagerness to take risks as well as the capacity to recognize and create new opportunities. This definition is corroborated by the Global Entrepreneurship Monitor (2015). Wennekers and Thurik (1999) additionally opine that entrepreneurship can be engaged by an established organization, a team or an individual. However, scholars have concentrated on the individual level perhaps because of the significance of individual characteristics on the entrepreneurial process. Therefore, it is safe to assume that successful entrepreneurship begins at the individual level.

The concepts of entrepreneurship and apprenticeship generally complement one another. Entrepreneurship stimulates socio-economic growth while apprenticeship enhances the entrepreneurship development process. Apprenticeship provides a ladder of opportunity to obtain critical skills businesses require to flourish, placing apprenticeship as the seedbed of entrepreneurship. Through the combination of these attributes, the business and entrepreneurial activities of the Igbos continue to be the backbone of commerce and manufacturing in the Nigerian economy (Orugun and Nafiu, 2014). Studies in entrepreneurial and business activities have placed Igbos above other ethnic groups in the country (Agozino and Anyanike, 2007; Orugun and Nafiu, 2014; Obunike, 2016; Iwara *et al*, 2019). Interestingly, the

economic activity of the Igbo tribe is very important given their miserable economic status immediately after the Nigeria/Biafra war, over five decades ago³. Instead of merely licking their wounds from the war, the Igbos used their distinctive entrepreneurship strategy to stimulate sustainable livelihood and economic growth (Agozino and Anyanike, 2007). They forged the spirit of “*onye aghana nwanneya*” (no one should leave the brother behind) to close ranks and survive economically. This approach preaches competitiveness and cooperative expansion in a sustainable and mutually beneficial manner. Their exploits led to the migration of Igbos from south-eastern Nigeria to other regions of Nigeria and beyond, where they developed various lines of enterprises (Agozino and Anyanike, 2007).

The IEM is hinged on the native apprenticeship practice known as *Igba-Odibo* which means “serving another” in the literal sense. However, the core objective is total servitude to the master at no cost but for a specified period (Iwara *et al.*, 2019). This in no way translates to disguised slavery since participation is voluntary and does not extend perpetually. The terms and conditions of IEM are commonly oral and negotiated by representatives of the mentor and prospective mentee, but embedded in the Igbo traditional worldviews, norms and customs (Obunike, 2016; Iwara *et al.*, 2019).

Due to the long and successful history of the IEM, it has assisted in transferring management skills and know-how, environmental scanning, persuasiveness, social and market awareness from master to apprentice across generations. One of the major characteristics of an entrepreneur is having good networking skills. During the period of apprenticeship, the apprentice is exposed to various channels of production and supply of goods, locally and internationally. The apprentice in turn leverages the exposure and networks to grow his enterprise when independent. This model also teaches the apprentice good management skills and financial discipline through close observation of the master’s coordination of personal and business affairs.

In summary, the IEM has several economic benefits some of which include; business networking, less vulnerability to business uncertainties, reduction of market search-related

³The Nigerian government instructed all currencies of the defeated Biafra state to be deposited in banks at the end of the war. In exchange, each account holder received the sum of 20 pounds irrespective of the amount of money in their account or had deposited (Iwara *et al.*, 2019)

transaction costs, the creation and utilization of social capital (trust), access to collateral-free credit, collective business expansion and job creation (Ichoku, 2019). It is also open to all since family or kinship does not exclude participation, unlike some other entrepreneurship models. This is the secret of IEM and indeed Igbo commercialism - a guild system that guarantees training for upcoming generations - which is uncommon among other cultures and tribes in Nigeria (Agozino and Anyanike, 2007; Obunike, 2016; Ichoku, 2019).

3. Literature Review

There are several entrepreneurship theories in the literature that apply to the distinct nature of the IEM. For instance, the anthropological entrepreneurship theory, which is traced to the works of North (1990) and Baskerville (2003), focuses on the decisive role of cultural contexts in influencing successful entrepreneurial activities. The theory predicts that for an individual to commence a successful business, the social norms and cultural settings should be considered (Omonijo *et al*, 2018). This theory shares key insights that explain how Igbo entrepreneurs generally acclimatise with the socio-cultural values of their host community for harmonious interaction and business transactions.

The opportunity-based entrepreneurship theory is another popular model linked to Drucker (1985) and Stevenson and Jarillo-Mossi (1990). The theoretic construct for business advancement in this theory is premised on the opportunity-hinged tactic. The theory predicts that entrepreneurs or investors do not wholly change; rather they discover new opportunities in every change regarding technology, customer preferences among others. This view is contrary to the submission of the Austrian or Schumpeterian school of thought which holds that entrepreneurs change although consequent upon evolving business prospects that alter entrepreneurial decisions (Drucker, 1985). Thus, as entrepreneurs explore adjustments in business decisions, they react to it by exploiting the opportunity it offers (Omonijo *et al*, 2018). Proponents of this theory also argue that several opportunities could be explored through environments, friends and other plausible avenues. This is within the *modus operandi* of the IEM since it is a veritable platform for identifying, appraising and grabbing business opportunities and initiating supportable action to guarantee sustainable success

In another relevant theory in literature, the resource-based theory by Stevenson and Jarillo-Mossi (1990) is mostly regarded as an extension of the opportunity-based entrepreneurship theory. Based on a study on assessing the disparity between administrative and

entrepreneurship management, Stevenson and Jarillo-Mossi (1990) conclude that the root of entrepreneurship lies in search of prospects outside the capital at hand. The adherents of this school of thought, particularly Alvarez and Busenitz (2001), argue that entrepreneur access to resources is a critical predictor of opportunity-based entrepreneurship and the growth of innovative businesses. Hence, the importance of financial, social and human resources in entrepreneurial development as shown by Aldrich (1999) becomes noteworthy. The access to resources for businesses could boost their capacity to spot and exploit discovered opportunities (Davidson and Honing, 2003). Interestingly, the IEM supports the efficient adoption of the financial and social aspects of these resources. The social aspect is premised on obtaining technical skills while the financial aspect focuses on the settlement from the master at the end of the training to start a new business venture.

The entrepreneurial event model (EEM) is another relevant theory advanced by Shapero and Sokol (1982), and subsequently validated by scholars like Krueger (1993) and Krueger and Brazeal (1994). The theory envisages that the event of entrepreneurship results from a blend of social factors (these factors comprise diverse ethnic groups) and the environment (cultural and social) being examined (Rail *et al.*, 2017). To describe the EEM, the theory recognizes three constructs (perceived feasibility, perceived desirability and propensity to act) as the most significant drivers of entrepreneurship intentions and entrepreneurship development (Agu and Nwachukwu, 2020). Krueger (1993) avers that the model is extremely contextual and addresses the enthusiasm of a potential entrepreneur; hence it is more appropriate for studies on entrepreneurship development. Since the thrust of this study centres on an economic assessment of the IEM within a traditional and social context, this theory relates more suitably to predicting the entrepreneurial attributes of the Igbos.

Research-wise, empirical examinations of the impact of entrepreneurship patterns on labour market and business outcomes have grown for both developing and developed economies. However, this empirical review focuses solely on studies that relate to the study objectives. For instance, Onyima *et al* (2013) relied on data from 40 Igbo entrepreneurs in Taraba State and found that the Igbo entrepreneurship scheme was vital in generating business ideas, financing, business location and ideas. Orugun and Nafiu (2014) in another study, assessed whether the entrepreneurial behaviours of the Igbos encourage Nigeria's economic growth. The study further ascertained if the IEM practiced was a contributory factor to their business success. Applying descriptive statistics, the study reported that the entrepreneurial behaviours

of the Igbos are a panacea for the country's economic growth and the entrepreneurship model is very instrumental to their business success. Obunike (2016) utilized data from 107 respondents and found that the IEM is very essential in raising funds for start-ups, business marketing, networking as well as profitability in business.

Igwe *et al* (2018b) employed key informants interview of 50 participants across the five Igbo states and found, among other things, that the scheme equips and nurtures young people with fundamental business skills as well as providing them with capital for start-ups. Omonijo *et al* (2018) concludes that the apprenticeship system of Igbos, over time, has been stimulating self-employment and driving entrepreneurial activities. The study further stated that the scheme could serve as a useable tool to tackle the unemployment menace in Nigeria. Similar findings were reported by Ugbaja (2019) while utilizing data from 251 entrepreneurs of Igbo extraction. Alike and Orjiako-Umunze (2019) reported that the Igbo apprenticeship scheme is essential in generating business ideas, business location and capital for start-ups. Correspondingly, in a more recent study, Agu and Nwachukwu (2020) conclude that the scheme significantly drives entrepreneurial potential and intention.

4. Research Methods

A quantitative research method was adopted to enable the study to obtain measurable, quantifiable and testable empirical evidence that provides answers to the research questions. Similarly, a quasi-experimental design was employed. The use of a quasi-experimental design enhances randomization and reduction of sampling bias. It also enhances the control of the confounding and extraneous variables (Shadish *et al*, 2002; Shadish *et al*, 2011).

Theoretical and Empirical Model

The theoretical framework for this study was anchored on Shapero and Sokol (1982) entrepreneurship model (the Entrepreneurial Event Model - EEM). This model predicts that entrepreneurship is intrinsically driven by social and environmental complexes that shape an entrepreneur's perception of feasibility and desirability of entrepreneurial opportunities as well as the propensity to act. As noted by Rail *et al*. (2017), entrepreneurial tendencies may be inculcated through non-cognitive processes, cognitive education, and mentor-mentee relationship or simply through doing-by-observing. The IEM is typically an Entrepreneurship Event Model that flourishes through an apprenticeship system and reinforced by cultural philosophies and social integration. In other words, the apprenticeship system is seen as the

life-wire of the entrepreneurship model. Invariably, although anyone can venture into entrepreneurial endeavours without necessarily passing through the apprenticeship system, the Igbos believe that an embedded apprenticeship system is the success factor of the IEM. Following Ryan *et al* (2007), Obunike (2016) opines that the IEM involves three apprenticeship stages, namely, cognitive, associative and autonomous stages. Embedding apprenticeship in an entrepreneurship scheme enables the prospective entrepreneur to acquire skills or mastery in the vocation of interest or process through interactive coaching that involves the master or expert trainer demonstrating the skill. In other words, to assess the economic viability of the IEM, conducting a counterfactual study involving entrepreneurs who passed through IEM and entrepreneurs who did not becomes essential. That is, researchers can model participating in IEM in much the same way as participating in an intervention program. In this manner, participating in the IEM becomes the treatment variable and to ascertain the impact of the IEM on business outcomes, one may need to perform a counterfactual analysis in which participating in IEM is treated as intervention or treatment variable.

To ascertain the distinctive impact of the IEM on business outcome requires that both entrepreneurs that adopted the model (the treatment group) and those that did not (the control group) are included in the study. To guarantee randomization and control of extraneous variables, the propensity score matching (PSM) technique was employed. Besides, given that randomized controlled trial (RCT) is not feasible with survey data, PSM is preferred since it uses matching algorithms to match the treatment with the control group. In other words, PSM enables the researcher to match participants in the treatment group with those in the control group (that is, those who do not participate in the treatment) (Becker and Ichino, 2002; Ogunniyi *et al.*, 2017).

To this end, this study employed the propensity score matching technique (PSM). To estimate the unobserved causal effects of participating in the IEM, it becomes necessary to reconstruct the counterfactual. Ideally, an entrepreneur cannot belong to both treatment and non-treatment group: the treatment group are people that participated in IEM while the non-treatment group are those that did not. The non-treatment group is the control group. PSM guarantees randomization which ensures that the estimation of the treatment effect is unbiased. The PSM estimates the effects of treatment on the treated by pairing treatment and control units with similar attributes on the propensity score and other likely covariates and by discarding all unmatched units.

Ideally, we want to estimate:

$$Y_d = r_d(X_d, U_d) \quad D \in \{0,1\} \quad 1$$

Where

d , which is the occurrence of the treatment, is indexed by the random variables $D \in \{0,1\}$, X refers to the observed attributes of the entrepreneurs and U denotes the unobserved attributes of the entrepreneur. Y_d refers to the outcome of interest (business growth, business survival rate, access to trade credit, ease of customer acquisition, access to informal credit, access to formal credit and business management skill). Specifically, Y_1 is the outcome if the entrepreneur participated in IEM (that is, the treatment) and Y_0 is the outcome if the entrepreneur did not participate in IEM. In other words, for a given entrepreneur, j , Y_j can be written as:

$$Y_j = Y_{0j} + D_j(Y_{1j} - Y_{0j}) \quad 2$$

Equation 2 may however become problematic since it is impractical to observe the same entrepreneur with and without treatment effect. To address this, an estimation of the average treatment effect on the entire sample for the treated. The estimation of the average effect of treatment on the treated (ATT)⁴ is presented as:

$$\begin{aligned} ATT &= E(Y_{1j} - Y_{0j} / D_j = 1) \\ &= E[E\{Y_{1j} - Y_{0j} / D_j = 1, p(X_j)\}] \\ &= E[E\{Y_{1j} / D_j = 1, p(X_j)\} - E\{Y_{0j} / D_j = 0, p(X_j)\} / D_j = 1] \end{aligned} \quad 3$$

One precondition for estimating the ATT is that the propensity score $p(X)$ must be obtained. As proposed by Rosenbaum and Rubin (1983), the $p(X)$ for $j = 1, \dots, K$ is the conditional probability of participating in IEM given a vector of observed covariates x_i :

$$p(X_j) = \Pr(D_j = 1 / X_j) = E(D / X) \quad 4$$

and

$$\Pr(D_j, \dots, X_1, X_2, \dots, X_k) = \sum_{j=1}^K e(X_j)^{d_j} \{1 - e(X)\}^{1-d_j} \quad 5$$

⁴ATT refers to the average effect of adopting or utilizing IEM on those who adopted it. This can be contrasted from ATE (average treatment effect) which averages the effect of the treatment (adopting IEM) on the entire population.

Where

$d_j = 1$ for treatment, $d_j = 0$ for non-treatment and X_j = the vector of observed covariates for the j^{th} entrepreneur. $P(X)$ is estimated for the covariates $X=R$, $X=R,S$ and $X=R,S,T$. $P(X)$ which ranges from 0 to 1 was estimated using standard logistic regression defined as:

$$\ln \frac{e(x_j)}{1 - e(x_j)} = \ln \frac{\Pr(d_j = 1/x_j)}{1 - \Pr(d_j = 1/x_j)} = \alpha + \beta^T x_j \quad 6$$

Where:

$$e(x_j) = \Pr(d_j = 1/x_j)$$

$$e(X_j) = \alpha + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_j X_j$$

Another technical requirement for estimating ATT is that the balancing and the confoundedness conditions should be satisfied. For balancing conditions and confoundedness to be satisfied, then Equations 7 and 8 must be true

$$Y_0, Y_1 \perp D / X \quad 7$$

Where \perp denotes statistical independence

$$Y_0, Y_1 \perp D / p(X) \quad 8$$

Another problem encountered in the estimation of ATT is that for the estimates to be unbiased, treated and untreated with similar attributes should be matched. Achieving this demand is quite difficult. Becker and Ichino (2002) suggested the use of appropriate matching methods. Becker and Ichino (2002), Caliendo and Kopeinig (2005) and Ogunniyi *et al.* (2017), identified the following matching method: stratification matching, nearest-neighbour matching, kernel matching and radius matching. We adopted both nearest-neighbour and the kernel matching approach. While the nearest neighbourhood method is preferred for its lower variance (Ogunniyi *et al.*, 2017), the kernel method may engender relatively more efficient estimates if the control group is distributed asymmetrically around the treatment group (Caliendo and Kopeinig, 2005).

The covariates are described in Table I. Following Angrist and Pischke (2008), most of the data are indicated in the form of dummies. Angrist and Pischke (2008) contend that dummy

indicators improve the quality of PSM. The variables are grouped into categories, namely, S-category (which includes specific attributes of the entrepreneurial business), R-category (which includes individual and family-related attributes of the entrepreneur) and T-category (which includes the outcome variables).

Table I. Description of Variables

Variable	Description	Mean	Standard deviation	Min	Max
S Category of Covariates					
Ln (number of workers)	Cardinal numbers showing how many persons the business employed as at the time of the survey.	0.252	0.334	0.00	1.575
Ln (duration of business)	Cardinal number indicating the number of years the business has been in operation.	0.320	0.653	0.034	1.789
Ln (business capital)	The net worth of the firm. We indicate this in natural log	5.907	2.089	3.997	7.675
R Category of Covariates					
Parent's educational level	We indicate secondary education and above as 1 and primary school and no formal education as 0.	0.378	0.032	0.00	1.00
Ln (parent's income)	We indicate this in natural log	5.076	2.011	4.009	6.980
Respondent's educational level	We indicate secondary school and above as 1 and primary school and no formal education as 0.	0.342	0.120	0.00	1.00
Ln (respondent's income at the time of business start-up)	Indicated in natural log	5.124	2.329	3.007	6.078
R Category of Covariates					
Gender	Male is indicated as 1 while female is 0	0.345	0.130	0.00	1.00
Ln (age)	Indicated in natural log	2.535	0.342	2.089	2.986
Household size	Cardinal numbers	4.659	1.011	1	9
Spatial location	urban =1, rural=0	0.563	0.045	0.00	1.00
Parents occupation	business=1, others=0	0.456	0.109	0.00	1.00
Marital status	single=1, others=0	0.339	0.190	0.00	1.00
Head of household	male=1, female=0	0.786	0.275	0.00	1.00
T Category of Covariates					
Income growth	Rate of change in annual income: we compared income in 2017 with income in 2018	14.98	3.906	-8.836	45.089
Business survival rate	We compared the number of years that business collapse before a comeback with the total life of the business	82.097	9.018	68.887	100.00
Access to trade credit	1=access, 0=no access	0.656	0.101	0.00	1.00
Ease of customer acquisition	1=easy, 0=not easy	0.598	0.016	0.00	1.00
Access to informal credit	1=access, 0=no access	0.856	0.225	0.00	1.00
Access to formal credit	1=access, 0=no access	0.236	0.043	0.00	1.00

Variable	Description	Mean	Standard deviation	Min	Max
Business management skill	1=ease of mastering the business, 0=no ease of mastering the business	0.679	0.178	0.00	1.00

Source: Authors computation

Sampling and data collection

This study designed a survey using semi-structured questionnaires to elicit the required information. Onitsha and Nnewi business clusters in Anambra state were selected using a purposive sampling procedure. The justification for limiting the study within Anambra state is because the IEM has a firm hold in the state. Unsurprisingly, it is sometimes referred to as the *Anambra entrepreneurship model* which has spread to neighbouring South East states due to its overriding success (Adi, 2012). Second, the two clusters in Anambra state are of particular interest to this study because of the sheer size of entrepreneurship activities in the state, attributable to the presence of established markets in the state. Third, the state is the commercial centre of South East, Nigeria (Bräutigam, 1997; Dimnwobi *et al.*, 2018). Fourth, two out of the five most notable industrial clusters⁵ in Nigeria are situated in the state (Bräutigam, 1997; Dimnwobi *et al.*, 2018; Ekesiobi *et al.*, 2018; Igwe *et al.*, 2018a). Finally, as noted by Orugun and Nafiu (2014), the IEM is largely homogenous. In other words, there are no locational differences in the pattern and dynamics of the model.

Apart from being predominantly occupied by Igbos (the study target group), the justification for focusing on clusters purposively selected from Onitsha and Nnewi include the presence of the following; the Onitsha main market (the largest open market in West Africa - Obunike, 2016), the Onitsha plastic cluster (the only plastic cluster in Nigeria and one of the biggest clusters in the country – Dimnwobi *et al* 2018), and the Nnewi automotive component industrial cluster (the most prominent cluster in Nigeria – Bräutigam, 1997; Ekesiobi *et al.*, 2018). The study, however, sampled 1,200 respondents from both Onitsha and Nnewi using a simple random sampling procedure. The choice of random sampling offers an equal probability of selection to all the respondents in the sample frame. It also guarantees the minimization of sampling errors and enables an estimation of unbiased and robust parameters. Using semi-structured questionnaire instrumentation, about 1,187 questionnaires were retrieved representing a 98.9% response rate.

⁵The clusters are located in Nnewi and Onitsha - Anambra state, Aba – Abia State, Ikeja – Lagos State and Kano – Kano State.

The sampled participants comprised of persons who participated in IEM and persons who did not participate in IEM. Out of the 1187 entrepreneurs, 789 participated in IEM while 398 did not participate in IEM. Only entrepreneurs who were business owners were included in the study.

4. Results

Likelihood of Engaging in IEM and Propensity Score

Table II reports the marginal effect on the probability of participating in IEM (which is the treatment). The standard logit was estimated for the three categories of the conditioning variables or covariates.

Table II. Conditional probability for participating in IEM

Covariates	R	R, S	R, S, T
Number of workers		0.079 (0.120)	0.059** (0.029)
Duration of business		0.418 (1.032)	0.329 (0.290)
Business capital		0.011* (0.006)	0.009** (0.004)
Parent's educational level	-0.005* (0.003)	-0.009** (0.004)	0.004** (0.002)
Parents income	-0.130*** (0.043)	-0.297** (0.127)	-0.065*** (0.007)
Respondent's educational level	-0.715*** (0.183)	-0.747*** (0.292)	-0.274*** (0.094)
Respondent's income at the time of business start-up	0.020*** (0.005)	0.1635*** (0.053)	0.007* (0.004)
Gender	0.190** (0.086)	0.0735** (0.030)	0.129*** (0.042)
Age	0.285*** (0.098)	0.1365*** (0.045)	0.147*** (0.050)
Household size	0.060** (0.028)	0.024* (0.013)	0.043*** (0.014)
Spatial location	-0.065** (0.026)	-0.141*** (0.042)	-0.039** (0.022)
Parents occupation	-0.025*** (0.009)	-0.021** (0.010)	-0.013*** (0.005)
Marital status at the time of starting business	0.035 (0.033)	0.1635* (0.086)	0.050** (0.021)
Head of household	0.08 (1.111)	0.4935 (0.399)	1.667*** (0.300)
Income growth			0.033 (0.033)
Business survival rate			0.073 (0.332)
Access to trade credit			0.007* (0.004)
Ease of customer acquisition			0.012* (0.007)

Covariates	R	R, S	R, S, T
Access to informal credit			0.009*** (0.003)
Access to formal credit			0.114* (0.058)
Business management skill			0.007** (0.003)
Constant	2.390*** (0.080)	4.002*** (0.098)	3.091** (1.023)
OBS	1187	1187	1187
LR(X2)	6488.691	6488.691	6488.691
PROB. (X2)	0.000	0.000	0.000
Pseudo R2	0.231	0.197	0.303

Note: *, ** and *** refers to 10%, 5% and 1% statistical significance

Source: Authors computation

The result indicates that the effect of omitted variables on the estimated likelihood of treatment is progressively reduced by each new set of conditioning covariates. The results suggest that individual attributes of the entrepreneurs and parent's characteristics are significant determinants of the likelihood of enrolling in the IEM. Specifically, people whose parents are richer or more educated are less likely to enrol in the IEM. Also, respondents with a lower educational qualification are more likely to enrol in IEM than others. The result also shows that those who reside in rural areas are more likely to enrol in the IEM than otherwise. This is quite intuitive. Those in urban areas are more likely to be more educated or have parents who are richer or more educated than those in rural areas. However, the covariates that are not statistically significant (including household size, marital status and duration of businesses) may not influence a participant's decision in participating in IEM. These covariates are therefore removed from subsequent estimations.

Table III summarizes the propensity score of the treatment for business growth, business survival rate, access to trade credit, ease of customer acquisition, access to informal credit, access to formal credit and business management skills. The logit estimation is not however reported here. Notice that the propensity score declines progressively as we introduce other covariates. The score from R set of covariates shall be considered as the upper bound while the score from R, S, T set of variables will be interpreted as the lower bound.

Table III. Propensity Score

Covariates	R	R,S	R,S,T
Business growth	0.253** (0.109)	0.081** (0.032)	0.063*** (0.020)
Business survival rate	0.415** (0.184)	0.179** (0.078)	0.151* (0.076)
Access to trade credit	0.145** (0.068)	0.020** (0.008)	0.009** (0.004)
Ease of customer acquisition	0.199** (0.086)	0.075** (0.031)	0.049*** (0.008)
Access to informal credit	0.417** (0.172)	0.207** (0.083)	0.199*** (0.050)
Access to formal credit	0.223** (0.090)	0.087** (0.035)	0.066*** (0.013)
Business management skill	0.170** (0.073)	0.060** (0.024)	0.048** (0.023)

Note: *, ** and *** refers to 10%, 5% and 1% statistical significance

Source: Authors computation

Average Treatment on the Treated

To estimate, the ATT, entrepreneurs who enrolled in IEM are matched with those who did not. The matching procedure guarantees that the matched entrepreneurs have similar observable attributes. Thus, any observed difference in business growth, business survival rate, access to trade credit, ease of customer acquisition, access to informal credit, access to formal credit and business management skill, arises from participating or not participating in IEM. Both the nearest neighbourhood and kernel matching algorithm were used to match the treated and the non-treated. The results were evaluated for robustness by checking the balancing between the means of treatment and non-treatment groups. The results obtained (not shown here) indicates that although there were significant differences in the pre-matching means of the groups, there is no significant difference in the means of the matched treatment and non-treatment group. The results show that the treated has business growth ranging from between 11.7% and 30.4%. However, the estimated business growth rate falls as we move from P(R) to P (R, S, T). The treated also have a business survival rate ranging from 15.1% to 18.5% considering results obtained from the kernel and nearest neighbourhood. In other words, business growth and business survival rate attributed to participating in IEM ranges from 11.7% to 30.4% and 15.1% to 18.5% respectively.

Table IV. ATT estimates based on the nearest neighbourhood

Matching on:	P(R)	P(R,S)	P(R,S,T)
Nearest neighbourhood			
Business growth	0.304** (0.143)	0.149** (0.071)	0.117*** (0.005)
Business survival rate	0.185*** (0.069)	0.164*** (0.032)	0.157** (0.075)
Access to trade credit	0.259*** (0.028)	0.188*** (0.065)	0.118*** (0.003)
Ease of customer acquisition	0.287*** (0.058)	0.120*** (0.004)	0.064*** (0.020)
Access to informal credit	0.282*** (0.055)	0.193* (0.049)	0.172** (0.077)
Access to formal credit	-0.259** (0.107)	-0.220** (0.090)	-0.217*** (0.082)
Business management skill	0.492*** (0.094)	0.248*** (0.041)	0.177*** (0.036)

Note: *, ** and *** refers to 10%, 5% and 1% statistical significance

Source: Authors computation

Another effect of treatment examined is access to trade credit. The result shows that the treated are more likely to have access to trade credit than the non-treated. To be specific, due to treatment, the treated could have access to trade credit ranging from 11.8% to 29.0%. This result is quite intuitive. For example, some of the entrepreneurs who participated in IEM noted that when their masters refused to settle them, they commenced business by collecting goods on credit from their suppliers. Also, the treated are more likely to acquire customers more easily than non-treated. The rate of customer acquisition due to the treatment is more for the treated by 11.8% (lower bound) and 28.7% (upper bound).

From the results obtained from Table IV and V, the research hypothesis contingent on the research questions can be tested. First, the null hypothesis that IEM does not have a significant impact on business outcomes (business growth, business survival and customer acquisition) of participants is rejected. The result obtained indicates that entrepreneurs that participated in IEM could significantly improve their business growth (by 11.7% to 30.4%), business survival (by 15.1% to 18.5%) and customer acquisition by (11.8% to 28.7%). Second, the null hypothesis that participating in IEM does not enhance access to credit is not tenable for trade credit and informal credit. However, it can be accepted for formal credit. The results obtained show that participating in IEM improves access to trade credit by 11.8% to 29%. It also improves access to informal credit by 5.2% to 28.2%. However, the null

hypothesis cannot be rejected for formal credit. The result obtained show that those that did participate in IEM rather have higher access to formal credit by 17.2% to 28.2%. Finally, the null hypothesis that participating in IEM does not have a significant impact on the owner's business management skills cannot be accepted. From Tables 4 and 5, it is confirmed that participating in IEM increases the business management skill of entrepreneurs by 17.4% to 49.2%.

Table V. ATT estimates based on Kernel Matching

MATCHING ON:	P(R)	P(R,S)	P(R,S,T)
	Kernel		
Business growth	0.299* (0.149)	0.167*** (0.032)	0.151** (0.027)
Business survival rate	0.173** (0.082)	0.152*** (0.030)	0.151* (0.079)
Access to trade credit	0.290*** (0.097)	0.164* (0.083)	0.144** (0.069)
Ease of customer acquisition	0.278*** (0.065)	0.114*** (0.007)	0.052*** (0.016)
Access to informal credit	0.175*** (0.053)	0.077*** (0.027)	0.052** (0.021)
Access to formal credit	-0.218*** (0.073)	-0.191*** (0.061)	-0.172*** (0.031)
Business management skill	0.443** (0.208)	0.246*** (0.080)	0.174*** (0.015)

Note: *, ** and *** refers to 10%, 5% and 1% statistical significance

Source: Authors computation

5. Discussion of Findings

The main thrust of this study is an economic assessment of the IEM. This was achieved by estimating the impact of the IEM, also described as a traditional business school by Obunike (2016), on the IEM alumni. One of the key findings is that IEM enhances business growth, business survival, and customer acquisition. These findings corroborate the prediction of the Entrepreneurial Event Model (EEM) of Shapero and Sokol (1982) on the willingness of participants to grasp entrepreneurial education and business opportunities within complex social and cultural environments. Järvelä, (1995) and Ryan *et al* (2007) further substantiate our findings that apprenticeship practice supports entrepreneurial growth and engenders productive outcomes. In the IEM, an apprentice is similarly moulded along the cognitive,

associative and autonomous phases suggested by Ryan *et al* (2007) and Obunike (2016). At the autonomous stage, the apprentice becomes a self-engaged entrepreneur and starts an independent business. While those that entered the business as novices will begin to learn on the job (through mistakes, trial and error, etc), the IEM entrepreneur must have completed the cognitive and associative processes, with a mission to explore fresh opportunities while consolidating on previous learning. This makes for improved business performance. Also, the treated are more likely to have better business management skills in the line of business than the non-treated.

Our findings also corroborate Obunike (2016) who observe that some apprentices whose masters failed to 'settle' financially started businesses with no external capital. They survived, leveraging on their relatively high knowledge of the business and the supplier and customer networks built during training. Through such supplier networks, they obtain trade credits and achieved high turnover through their ease of customer acquisition. Abubakar (2019) also obtained evidence that the IEM could be instrumental to the success of *technopreneurs*.

Further evidence from the results shows that, although the IEM alumni are more likely to have access to trade credits and informal credits, the non-IEM alumni appear to have better chances of accessing formal credit. For informal credit, opportunities for getting credit from family, friends and relatives are excluded. Informal credit is restricted to include traditional credit institutions such as *isusu* (crowd-funding) or other self-help associations (eg Meeting *Ndi-Line*; Business Club Meetings, etc). Formal credit is described as credit from deposit money banks and related financial institutions. The result shows that, while the IEM alumni have more access to informal credit, the non-treated are more likely to have access to formal credit. Although there is no prior study (known to us) on access to credit by IEM alumni, Yelwa *et al*, (2017) obtained evidence that micro-enterprises have more access to informal credit than formal credit. On the other hand, De Luca *et al* (2019) found that informal credit such as crowd funding is essential for micro-business start-ups. However, this study established that lack of access to formal credit is more pronounced for the IEM alumni than non-IEM alumni.

Although related studies on the IEM exist, there has not been any counterfactual study that controls for the effects of other factors on the subject. There could be other factors (including the level of education, business capital, business location, etc) that may influence the business

outcome of entrepreneurs. However, propensity score matching controls for such factors since the average effect obtained is the effect of the ‘intervention’ which is participation in IEM. In contributing to the existing knowledge, our findings obtained quantitative estimates of the impact of IEM on the business outcome, access to credit and business management skills. Specifically, this study obtained evidence that the IEM alumni have more access to trade and informal credit than non-IEM alumni. Conversely, an IEM alumnus has limited access to formal credit. The study also contributed to the existing literature on the IEM by further establishing that an IEM alumni has a higher business survival rate than non-IEM alumni.

6. Conclusions and Implications

The IEM is a traditional apprenticeship system peculiar to the Igbos of Nigerian origin and replicated within and outside the south east region of the country. This study provided an economic assessment of the IEM by estimating the unique impact of the IEM on the IEM alumni. The utilization of the entrepreneurial event model and PSM was considered apt for a study of this nature. The findings of the study indicate that micro-enterprises (most enterprises in the clusters surveyed are micro-enterprises with not more than 10 employees) owned by entrepreneurs who participated in the IEM have higher business survival rate, business growth rate, access to informal credit as well as greater skills for customer acquisition and excellent management skills.

Implications for policy and Practice

The IEM could be integrated into national entrepreneurship development programmes. Corroborating with Kehinde *et al.*, (2016) and Peter *et al.*, (2018) noted that businesses started with government enterprise promotion support in Nigeria experience a high failure rate. Adopting and integrating the IEM in the entrepreneurship development programmes of the federal and sub national governments could improve business outcomes. Through the IEM, the macroeconomic outlook of the country could be brightened by reversing existing dismal business performance records and boosting the survival of more enterprises. Another important implication of the study findings positions the IEM as a springboard for raising entrepreneurs in the country. It guarantees that the business management skills of older entrepreneurs are replicated in the younger entrepreneurs thereby minimising the chances of losing knowledge stock. The IEM could, therefore, be integrated into diverse business

mentorship programmes and academic courses in business schools. This presents a near cost-free approach to business mentorship.

Another implication of the findings is that access to formal credit may be driven by factors other than business performance. Although the IEM entrepreneurs are characterized by superior business performance, they have relatively less access to formal credit than non-IEM entrepreneurs. This suggests that formal credit may be constrained by information asymmetry and moral hazard. Hence, policies aimed at encouraging business financing should develop a framework for tracking the business performance of entrepreneurs. The reluctance of the IEM alumni may be indicative of a lack of confidence in formal financing windows. This also suggests the need to strengthen general and microcredit institutions to bolster the confidence of the traditional business start-ups. Public enlightenment on the existence and operations of credit institutions will also improve access to credit by IEM alumni. The government should also strengthen partnerships between financial institutions and business associations to support successful graduates of the IEM with access to funding for business start-ups or expansion.

Implications for Research

We presented an opportunity to assess how the IEM can be utilized as a veritable entrepreneurship or enterprise development model for Nigeria. However, the sample of the study was limited to only businesses located in two major business clusters in Anambra state where the model was experimented. We advocate that other studies should focus on the other regions of the country where Igbo businesses are located, particularly Lagos state, which is the commercial nerve of Nigeria. We believe that such studies would give more insight into how various contextual variables influence the IEM and broaden the dimensions for entrepreneurial policy intervention.

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