

The formalization of the Egyptian informal sector: a behavioral and experimental approach

Formalization
of the Egyptian
informal sector

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Received 14 May 2022
Revised 26 December 2022
Accepted 23 March 2023

Abstract

Purpose – This paper aims at assessing the impact of a number of behavioral interventions on the willingness of informal businesses, in the Egyptian informal sector, to join the formal sector.

Design/methodology/approach – This paper uses an experimental methodology to examine the impact of behavioral interventions on the formalization of the Egyptian informal sector. Specifically, it conducts a survey experiment on a total of 240 informal businesses, operating in the Egyptian informal sector. The primary data collected from the survey experiment is then analyzed using a binary logistic regression to assess the impact of the behavioral primes on the probability of joining the formal market.

Findings – The empirical findings of the survey experiment indicate that the biggest obstacle facing informal businesses is finding a formal source of finance that could help them in penetrating the market. Providing informal businesses with information on funding opportunities offered by the ministry of micro, small and medium enterprises (MSME) significantly increased the probability of joining the formal sector to benefit from this opportunity.

Originality/value – This paper is the first to apply behavioral primes, in the form of informational cues, to the Egyptian case of informal business owners. Previous research on the use of behavioral nudges and primes has focused mainly on the western economies.

Keywords Survey experiment, Primes, Egypt, Informal sector, Formalization

Paper type Research paper

1. Introduction

The informal economy stays a topic for extensive research especially after the economists and policy makers have agreed that sustainable development is a multidimensional process that involves the development of several aspects simultaneously, i.e.: reorganization and restructuring of the national organizations, acceleration of economic growth, reduction of poverty and inequality, preservation of resources for future generations and the minimization of the informal sector (Ministry of Planning and Economic Development, 2021). Following the 2008–09 world financial crisis and the 2020 global pandemic of COVID-19, researchers have become more concerned with developing the private sector, enhancing job creation and improving formal social safety nets. Given the fact that the informal economy has become a common phenomenon amongst all capitalist economies, there has emerged a renewed interest in the study of the informal economy and its ramifications on the sustainable development

JEL Classification — C93, D22, E26, E71

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The authors would like to thank Professor Heba Nassar for her continuous support and comments throughout the conduct of this research.



path. Levels of informality have been found to be negatively correlated with the gross domestic product (GDP) per capita, human development index, labor productivity and positively correlated with poverty levels (OECD/ILO, 2019). In Egypt, the informal economy has been increasing in size especially after the outbreak of the 25th of January revolution in 2011 to reach more than 50% of total nonagricultural employment in 2019 (ILO database, 2022). In fact, all countries, whether developed, emerging or developing have experienced the phenomenon of the informal economy with different sizes. For example, the size of the informal economy in Ecuador, India and Bangladesh is 65%, 80% and 91% of GDP respectively compared to 18% of GDP in high income Organization of Economic Cooperation and Development (OECD) countries (Schneider, 2010; Medina and Schneider, 2018).

Although informal markets provide significant degree of flexibility and adaptability for informal firms, they are limited in their ability to provide a legal framework for resolving financial disputes or making large scale investments (Sutter *et al.*, 2017). Informal institutions also do not track financial transactions or generate taxes, which in turn makes the formal sector superior to it. A growing body of literature has studied the decision of formalization; from the perspectives of the motivations and the impact of such decision on the informal firms (Webb *et al.*, 2014; Sutter *et al.*, 2017). According to prior empirical studies, various interventions to promote formalization of the informal firms have been met with limited success (De Mel *et al.*, 2013; Galiani *et al.*, 2017). Many of the interventions have focused on cutting the costs of registration and enhancing the benefits of formalization (Benhassine *et al.*, 2018; De Mel *et al.*, 2013). This approach is based on an implicit assumption that the primary decision-maker is motivated by the rational choice of cost-benefit optimization (Blackman, 2000; Siqueira *et al.*, 2016). Nevertheless enhancing formalization needs to consider more factors than the financial costs of registration and taxation.

This article seeks to examine the formalization decision from a behavioral decision-making perspective by focusing on the case of Egypt. To achieve this, we conceptualize formalization as a risky and uncertain decision that is subject to the bounded rationality of the decision maker who uses simplified judgment criteria known as the satisficing approach. An experimental survey on 240 Egyptian informal businesses is conducted to test the impact of two behavioral interventions on the willingness to accept the decision to formalize. Towards this end, this article is divided into four main sections. The first section covers the definition of informality, the factors affecting the size of the informal sector and previous empirical studies analyzing the formalization decision. The second section delineates the behavioral approach as the theoretical framework of this study. The third section presents the methodology and survey experiment. In the last section, the results, final discussion and conclusion are presented.

2. Literature review

2.1 *The concept of informality*

The phenomenon of the informal economy has been described by many adjectives like hidden, illicit, unregulated, nonmonetized, gray and underground. The International Labor Organization (ILO) has defined the informal employment as all remunerative work that is not registered, regulated or protected by a legal framework. The ILO has identified several common features amongst informal enterprises, including having easy access to the local market, family ownership of local resources, reduced scale of activities, labor intensive techniques of production and low skilled workers (ILO database, 2022).

Given the heterogeneous nature of informal economies, one can articulate two main approaches in the literature to explain the phenomenon of informality: the definitional approach and the behavioral approach. The definitional approach considers the informal economy as any unrecorded economic activity that exists outside the regulatory framework of the economy (Weller and Beer, 2022). The behavioral approach focuses on the study of certain behavioral characteristics associated with informal entrepreneurs who tend to stay

hidden and away from the eyes of the state. When an entrepreneur deviates from the standard rules of formality in the country, he/she moves out of the formal market to operate in the informal market (Feige, 1990; De Castro *et al.*, 2014; Weller and Beer, 2022). The entrepreneur will operate without a license, industrial registration and social insurance coverage for workers and without paying taxes. This state of noncompliance with the regulations leads to the existence of the informal economy. In this article, we limit our definition of informal sector to firms that produce only legal goods and services but fail to register and comply with taxation laws and regulations. This allows us to focus on the informal firms that have the potential to join the formal sector.

In all economies, informality is a mixture of both exit and exclusion practices; in other words, some stay outside the formal sector voluntarily and some are forced to stay in the informal sector due to their poor conditions. In developed economies, a significant proportion of the informal entrepreneurs are migrants who have limited work opportunities in the countries hosting them. Language barriers, lack of adequate education, absence of specific work experience in the host country and ethnic discrimination in many cases, make informal self-employment the only option for those migrants (Harney, 2012; Piperopoulos *et al.*, 2021; Darbi *et al.*, 2018). In other cases, the inability of entering the formal market due to lack of capital or labor skills is an example of exclusion. Business owners who prefer to employ cheap labor-intensive techniques to decrease the cost of production and stay hidden to avoid declaring labor, paying taxes and complying with the rules and regulations, voluntarily exit the formal market (Oviedo *et al.*, 2009; Darbi *et al.*, 2018).

Different initiatives are introduced by governments to promote the formalization rates through decreasing the cost of registration, simplifying the registration procedures, introducing tax exemptions, but ended up with limited success (Bruhn, 2013; De Mel *et al.*, 2013; Galiani *et al.*, 2017). This approach is based on the notion that informal firms behave rationally and take the decision to stay informal due to the high costs of registration that outweigh the benefits earned (Siqueira *et al.*, 2016). The cost-benefit argument is a simple representation of a complex decision that involves interdependent variables that affect the formalization decision and other decisions facing the informal firm. In fact, the decision-maker must put into consideration other factors that go beyond the financial cost of registering and paying taxes. The firm must modify all operations and procedures to adhere to the rules and regulations that govern the formal market, like expecting inspection visits by government employees to check the quality of the products, relying on contractual agreements with supply chains instead of a word of mouth, and changing all informal transactions to comply with legal standards. In the middle of all that change, the firm owner faces other risks due to an unstable working environment especially in countries with large informal economies (Narula, 2020). Given all those factors, it is difficult to have an accurate estimation of the costs and benefits of the formalization decisions, which in turn brings us to the notion of bounded rationality.

2.2 Factors affecting the size of informal sector

As mentioned earlier, all economies whether developed or developing suffer from the presence of an informal sector to an extent. The informality ratio is always higher in less developed economies due to two groups of factors: The first are structural factors which include the institutional regulations and financial pressures. Formal institutions stipulate laws and provide incentives that promote lawful behavior. Weak governmental institutions fail to enforce law and to provide effective formal market exchanges (Webb *et al.*, 2019), making it difficult to operate in the formal market, thereby creating the motivation to operate with the informal market mechanisms (Webb *et al.*, 2019; Williams *et al.*, 2017; ILO *et al.*, 2021). The second are opportunity factors which include the individual characteristics of the

entrepreneur, his/her societal background and geographic status. For instance, the entrepreneur's age, education, business experience, perception of risk and self-confidence play a profound role in their decision to register (ILO *et al.*, 2021).

Researchers suggest that addressing the factors that cause the informality phenomenon can help minimizing it and can bring numerous benefits to the economy. Despite the important contributions of prior research on the formalization of the decision-making process, it is based on an implicit assumption that the informal firm takes a decision based on a rational cost-benefit optimization approach where the decision-maker can collect all the necessary information and process it to reach the correct decision at the right time (Sutter *et al.*, 2017). Prior research has focused on the benefits and costs of formalization that are created due to the rules and regulations enforced by governments. One stream of thought holds that the primary reason behind the decision to stay informal is the high costs of registration and time-consuming procedures required to formalize (Godfrey, 2011; Siqueira *et al.*, 2016). Another stream of thought holds that firms decide to stay informal when the perceived cost of registration is higher than the perceived earned benefits from the decision to formalize the business (Blackman, 2000; Perry, 2007).

However, empirical studies examining the impact of reducing the cost of transition to the formal sector have found insignificant or low responses to such interventions (Bruhn, 2013; De Mel *et al.*, 2013; Floridi *et al.*, 2020). For example, Benhassine *et al.* (2018), conclude that the government interventions to reduce the cost of formalization are ineffective as the firms end up paying more cost to formalize than the financial benefits they earn. De Mel *et al.* (2013), find that reimbursing the cost of registration has no effect on the firm's decision to formalize. Santini *et al.* (2018), finds that 16.3% of the informal firms accept to join the formal sector after being treated with a full package of support and tax mediation services. This implies that the perception of the primary decision-maker (business owner) of the costs and benefits is a main factor that influences the decision and that the cost of joining the formal sector goes beyond a standard payment of registration fees and taxes. Nevertheless, there is no explanation why some informal business owners operating in the same macroenvironmental conditions perceive the decision as more or less beneficial. This highlights the need to develop the approach towards the informal sector and add to it a behavioral dimension. In this article, we propose an alternative view of formalization based on the bounded rationality of the primary decision-maker.

3. Conceptual framework

3.1 *The behavioral approach in economics*

Over the past several decades, a new approach to economics has emerged and attracted the attention of the economists, policy makers and the general public. Behavioral economics is a new field in economics that employs theories from neurology, anthropology, psychology, sociology and other disciplines to study the decision making process done by the human mind in areas like saving, spending and investing. Conventional economists considered the individual as a perfectly rational creature and referred to him/her as "Homo Economicus". This homo economicus is a selfish and a rational maximizer of his own personal utility regardless of moral values or social norms (Ogaki and Tanaka, 2019). Traditional economists also assume that this rational agent collects all the information and takes decisions based only on his/her cost-benefit calculations (Ghisellini and Chang, 2018). However, a number of studies have shown that the assumptions held by traditional economists do not hold true in many experimental studies. The behavior of individuals varies from one situation to another according to the available information, time, surrounding conditions and whether the individual is acting alone or is present in a group (Ghisellini and Chang, 2018). This has encouraged economists to observe and re-examine many economic decisions using the

behavioral approach. Field experiments have shown that human beings are overloaded by the huge amount of information available nowadays due to the technological advancement which tempts them to use heuristics or mental shortcuts to take many decisions (Pauschunder, 2020). From this point, researchers have begun to spot the human biases and use it to improve the understanding of the decision-making process. At the center of this research is the concept of bounded rationality and its impact on leading to biased decisions.

Herbert Simon introduced the concept of bounded rationality in the decision-making process. Unlike the rational-actor approach which focuses on maximizing behavior and the comparison of costs and benefits, Simon contends that it is important to focus on how individuals make decisions in a bounded-rational environment. He defines bounded rationality as “behavior adaptive within the constraints imposed by the external situation and the capacities of the policy maker”. This involves two types of constraints; (1) external constraints, which include the effects of the external environment, such as missing or incorrect information and (2) internal constraints, which emanate from the individual’s human characteristics, such as the limited intellectual capacity to study complex issues, perceptions and biases (Simon, 2000). Under these constraints, Simon introduced the concept of “satisficing”, according to which the individual will use his/her limited knowledge and mental capacity to reach the best choice given the changing environment. An individual will stop his/her search as soon as a choice can offer a good enough or a satisfying result (Simon, 2000). Simon’s concept of bounded rationality does not resemble the concept of “optimization under constraints”. In bounded rationality, the search for the optimal solution will not continue until the utility is maximized, but it stops when the choice is satisficing to the agent (Simon, 2000; Abdulkadrov, 2016; Ghisellini and Chang, 2018).

3.2 Prospect theory

The prospect theory constructed by Kahneman and Tversky does not define the decision maker’s choice in terms of a utility function of wealth. Instead, it assigns values to gains and losses rather than final wealth; and probabilities are replaced by decision weights (Kahneman and Tversky, 2013; Ghisellini and Chang, 2018). The value function is characterized by having a reference point and is normally concave for gains (illustrating risk aversion), convex for losses (illustrating risk seeking). Kahneman and Tversky have studied cognitive biases that lead to decision errors due to employing heuristics or mental short-cuts in the decision-making process. They have identified two modes of thinking that are present in the human mind, which are reasoning and intuition (Kahneman and Tversky, 2013). Reasoning is done consciously like when we do mathematical calculations to read a map, while intuition is done spontaneously in the human mind without effort. System 1 (Reasoning) is often slow and intentionally controlled, while system 2 (Intuition) is fast, automatic, effortless and emotionally charged, which makes it more difficult to control (Kahneman and Tversky, 2013). Individuals tend to assign most of the mental tasks to system 2 (Intuition) rather than system 1. This leads to the undertaking of many decisions based on their intuition, which is fast, emotional and lacks rationality.

In addition, prospect theory divides the decision-making process into two phases: a) the framing phase; b) the evaluation phase. In the framing phase, the decision-maker reorganizes the offered prospects reaching a simpler representation of them. In the evaluation phase, the decision-maker chooses the prospect with the highest value in isolation of their current wealth (Kahneman and Tversky, 1979). Prospect theory also assumes that the decision-maker frames the outcomes of a decision into gains and losses relative to a neutral reference point. The reference point is critical in determining whether the outcomes are framed as gains or losses (Kahneman and Tversky, 1985). This explains why some informal firm owners consider the formalization decision as a loss and prefer to stay in the informal sector, while

others consider it as a gain. It is due to the difference in the reference point they use while framing the prospect. If the outcome is above the reference point, it will be framed as a gain while outcomes below reference points are framed as losses (Kahneman and Tversky, 1981).

3.3 Nudging, paternalism and cognitive biases

The attempt of the policy makers to nudge individuals to choose the correct actions that are in their best interest is known as “paternalism”. Scholars differentiate between soft and hard paternalism (Kahneman, 2003). In soft paternalism, policy makers “nudge” individuals to make a certain choice, but they are still free to pick the alternative choice. In contrast, hard paternalism does not allow the individual to choose, as policy makers will make only one choice available for people (Abdukadirov, 2016). Both soft and hard paternalism rely on making good choices less costly compared to bad choices, but the main difference between them is the cost paid by the individual when he/she opts out of the default choice. For example, in the case of soft paternalism, the cost can be the mental effort done to think about all the other choices, but in the case of hard paternalism, the cost can be in the form of paying extra money for making a choice different from the default one (Abdukadirov, 2016).

Given the heterogeneous nature of the people and the uncertain and complex business environments, biases and heuristics can be essential tools in the decision-making process. Cognitive biases are “thoughts that involve erroneous inferences of assumptions” and heuristics are “rule of thumbs” (Abdukadirov, 2016). Entrepreneurs experience an over-optimism bias which makes them overestimate the probability of being right when taking any decision. Research studies show that over-optimism bias is more present in young entrepreneurs, which makes them more risk seekers. For example, an over-optimist entrepreneur can take the decision to expand his venture despite the negative market feedback. He tends to underestimate the risks and to overestimate the value of the opportunities. Over-confidence involves more than one aspect: overestimation, overplacement and overprecision (Bernoster *et al.*, 2018). Overestimation is present when an entrepreneur overestimates his/her actual performance. Overplacement takes place when an entrepreneur places more value to his/her performance relative to others. Overprecision is having excessive belief in one’s precision (Bernoster *et al.*, 2018).

Illusion of control takes place when an individual relies on his/her skills to enhance performance in a situation where skills are not the deciding factor. Individuals who experience an illusion of control may be over-optimistic and overconfident as well. This implies that illusion of control overlaps with the over-optimism bias and the overconfidence bias (Thomas, 2018). The illusion of control bias encourages an entrepreneur to consider a limited number of alternatives while taking decisions. The belief in the law of small numbers happens when an entrepreneur uses a limited number of information to reach a firm decision about an issue (Thomas, 2018). This bias highly resembles the representativeness heuristic which is used when taking decisions in a certain situation by searching in memory for a similar past situation and assuming that both events are similar.

Reference to the problem of bias, individuals tends to prefer small immediate rewards rather than larger ones in the future, and this is known as “discounting the future bias” or “hyperbolic discounting”. On the one hand, informal entrepreneurs avoid registering their businesses to save the cost of registration, which in turn decreases their present profits. In this case, the saved money is the immediate present reward for them. On the other hand, they miss the larger rewards in the future in case they register and obtain loans to grow the business. This creates a status quo bias, which is the preference of an individual to stay in the present situation, leading him/her to resist any change to the present state. This is very similar to the representativeness heuristic where an individual searches in his memories for a similar situation to help him make a faster decision. In other words, when informal

entrepreneurs focus on the present (availability heuristic) and feel more comfortable in it (status quo bias), they ignore the future (discounting the future heuristic) and tend to believe that they are in control if they keep on the same track (the illusion of control bias). Under this condition, the solution is to use informal entrepreneurs' biases and heuristics to steer them towards growing their businesses, and this will happen only if they register and enter the formal sector.

There is a growing body of literature examining the impact of nudging on the decision-making process in several policy areas like healthcare, environment, retirement savings, education and tax compliance. Meyer and Rosinger (2019) highlight the impact of low-cost behavioral interventions of the United States (US) government to facilitate the process of going to college and reduce the informational barriers. Simplifying financial aid forms and using nudges to prompt action by sending email reminders, providing guidance and reference points to help students evaluate options are important behavioral interventions that can raise the rate of college enrollment (Meyer and Rosinger, 2019). In another study assessing the impact of nudges on saving decisions, a group of employees were offered a financial incentive if they would assign part of their salaries each month to be transferred to their savings accounts. It was found that the default assignments succeeded in changing the employees' spending and savings attitude (Blumenstock *et al.*, 2018). In the same vein, an experimental approach testing the impact of two behavioral primes on tax compliance behavior: 1) having a voice in the allocation of tax, 2) triggering empathy in public spending found both primes statistically significant and had a positive impact on the willingness of subjects to comply (AbdelNabi *et al.*, 2022). Indeed, the nudging approach has proven to be an efficient method in several policy areas as it is a low-cost intervention method that does not limit the choice of people and succeeds to change the attitudes of people.

3.4 Informal firms' aspirations and the decision to formalize

Informal firms exist because they communicate in a network of informal agencies and customers that consider them legitimate. They enjoy a "sociocultural" legitimacy due to aligning to the customary rules of the informal sector agencies (Webb *et al.*, 2019). They also rely on this legitimacy to have access to resources, markets and competitive advantage, and, accordingly, to secure survival (De Andrade *et al.*, 2016). This makes one of the main targets of an informal firm owner is to gain legitimacy from the informal institutional stakeholders and aspire to keep it. An obvious example here is the acceptance to sell on credit without taking a cheque and depending on the word of mouth or trust from the suppliers. In this context, informal firm owners are more alert to the information coming from the informal economy as they aspire to maintain their legitimacy and survival. They are not attentive to the initiatives launched by the governments to help them join the formal market and develop their businesses. Accordingly, this article argues that adding an informational nudge to the initiative can catalyze the process of formalization in Egypt.

An important factor that affects the decision of formalization is whether the informal firm's aspirations are survival-driven or growth-driven. On the one hand, survival-driven informal firms are usually started to secure an income or satisfy basic needs for the business owner. The primary target is to sustain the business and not to grow or expand the scale of operation. On the other hand, growth-driven informal firms operate with the purpose of increasing the wealth of the firm owner through searching for entrepreneurial opportunities in the market. In this case, the growth-oriented entrepreneurs can choose between staying in the informal market or formalizing the business (Williams *et al.*, 2017). These firms are sufficiently productive and can survive the competition in the formal market (Ulyssea, 2018). According to the prospect theory, informal entrepreneurs with different aspirations or goals (survivalists vs growth-oriented) adopt different reference points while considering the

formalization decision. This, in turn, leads each type of informal entrepreneurs to frame the expected outcomes of the formalization decision differently.

4. Methodology and survey experiment

4.1 The behavioral experimental approach

This study aims at examining the impact of two behavioral nudges – finance and networking – on business formalization behavior. The study uses a survey experiment applied to 240 subjects that run informal businesses in Egypt from three different cities, namely Al-Obour, 6th of October and Al-Sherouk. The initial search strategy was based on a snowball method and the sample was collected over a period of 3 months from June to August 2021. We also decided to pay a visit to the ministry of micro, small and medium enterprises (MSME) office in the 6th of October city to inquire about the service packages that are offered to small businesses. In the meeting, the free services offered to informal and/or formal entrepreneurs were discussed in detail. These included the offering of (1) advice and customized feasibility studies to help with the startup of businesses, (2) free online courses on constructing business plans, the basic business accounting methods and getting access to loans with discounted interest rates.

The subjects were assigned randomly to one of three groups: control, treatment 1 and treatment 2 groups. The first nudge was related to finance as the MSME offers several finance initiatives that suit all types and sizes of projects. The initiatives are designed based on the feedback the MSME receives from informal business owners pertaining to the difficulties they face in getting access to formal finance. According to the interviewed subjects, most banks do not offer diversified products that best fit their varying needs. They also added that the financing decisions made by the banks rely on basic documents (registration documents/ license/tax card) and the financial performance more than the growth potential of the business. Also, the low level of profit margin reported to the tax authorities decreases their chances to obtain a reasonable interest rate for loans from formal sources.

The second nudge was chosen based on the MSME initiative to connect the small and medium enterprises (SMEs) with large corporations to sell their products/services. Helping SMEs network with large corporations is expected give them better chances to become well established in the market, especially if the SMEs operate in a sector dominated by large businesses. Guaranteed revenue streams are also expected to enable SMEs establish growth strategies and business plans. Large corporations can also contribute in up-skilling and improving the work process in SMEs. In this context, one can observe that the Egyptian government has recently begun to help SMEs take advantage of several kinds of value chain/business linkages, including backward and forward linkages. Backward linkages occur when large corporations buy materials or services from local suppliers ([Creative Associates International, 2014](#)). Forward linkages with customers occur when multinational corporations outsource the distribution of their brand-name products through marketing outlets. Also, large corporations can engage in joint ventures with local partners offering them access to technological and managerial know-how ([Creative Associates International, 2014](#)). This nudge is expected to attract informal entrepreneurs to the benefits reaped from these linkages, and to convince them to move their businesses to the formal sector.

Three experimental surveys were distributed equally over our sample of 240 informal entrepreneurs. The control group was used as a benchmark to compare the impact of the two behavioral nudges that were applied in treatment 1 and treatment 2 groups. Three blocks of questions were asked to the subjects. The first block gathers personal information about the participants, such as age, gender, education, work experience. The second block gathers information about the informal business, such as the age of the project, location, willingness to expand the business. The third block applied the nudge question and gathered responses

about the willingness of the participants to formalize their businesses based on the proposed nudge. For the control group, participants were asked the same questions without being exposed to the nudges. The finance nudge was then introduced to the treatment 1 group and the networking nudge was introduced to the treatment 2 group.

4.2 Sample descriptive statistics

In our experimental survey, males represent most of the sample (around 72%) and for the marital status; the majority are married (around 60%). For the educational level, most of the subjects have either two year of postsecondary education (diploma) or four years of postsecondary education (bachelor's degree). This relatively high educational level is understandable given that the Egyptian government subsidizes public school and university education. For the age brackets and years of experience, the sample reflects all categories of those variables.

We started by encoding all variables to be able to run the regression model since they are all categorical variables. The dependent variable measures the willingness of the informal entrepreneur to formalize his/her business. It is a dichotomous variable that takes only the values of 1 or 0; with willingness to formalize (YES) taking the value of 1 and unwillingness to formalize (NO) taking the value of 0 in the binomial logistic regression model. Two logistic regressions were conducted; one measuring control group results against the finance nudge applied to the treatment 1 group and the second measures control group results against the networking nudge applied to the treatment 2 group.

4.3 Model specification

$$\begin{aligned} \text{Willingness to formalize (WTF)} = & \beta_0 + \beta_1 \text{Finance Nudge} + \beta_2 \text{gender} + \beta_3 \text{Age} \\ & + \beta_4 \text{education} + \beta_5 \text{experience} + \beta_6 \text{Age of project} \\ & + \beta_7 \text{project location} + \beta_8 \text{project expansion} \end{aligned}$$

4.3.1 Treatment 1: finance nudge. In the first treatment, we presented subjects with information on the funding opportunities offered by the MSME to those willing to register their projects. The aim was to test the impact of this informational nudge on the willingness of informal business owners to join the formal sector. In other words, we sought to test whether this behavioral intervention would incentivize the formalization of the informal sector. Specifically, we provided subjects with the following information: **“Do you know that the MSME will finance your project starting with 10,000 EGP to 40,000 EGP without presenting an official project license and will offer a fund starting 40,000 EGP to 100,000 EGP if you present a temporary project license? Would this piece of information affect your decision to register your business?”**

As mentioned earlier, the formalization decision is an uncertain decision that involves risk to the informal firm. Upon acceptance to formalize, the informal entrepreneur faces the risk of failure when moving to the formal market. As a result, we need to consider the formalization decision as a risky decision and to investigate the extent to which the introduction of a behavioral nudge affects the decision to formalize. We expect that informing the informal entrepreneur about the finance initiative launched by the Egyptian government will incentivize the growth-oriented entrepreneurs who aspire to develop their businesses. Thus, they will be more willing to formalize. We also expect that survival-driven firms will be more concerned about preserving their legitimacy in the informal sector and will be risk-averse towards the formalization decision. Thus, we hypothesize that:

H1. Upon receiving the finance nudge, informal entrepreneurs will be more willing to formalize the business.

The following table shows the results of the logistic regression (see [Table 1](#)). The model hits a classification accuracy of 68.55%. The omnibus tests of the model coefficients indicate a significance value of 0.05, which shows that at least one of the independent variables is statistically significant with a $\chi^2 = 27.80$. The pseudo R2 denotes that at least one of the variables in the regression equation explains 13.07% of the variability in the compliance of the subjects. Based on the following results, we find enough evidence to accept our [first hypothesis](#) (see [Table 2](#)).

For our finance informational nudge, it was found to be significant at p -value of 0.00, denoting that the subjects in the treatment group who received it had 3.94 times the odds to comply with the nudge than the subjects in the control group. Subjects who ran informal businesses more than 5 years have 8.77 times the odds to comply with the nudge. This implies that as the subjects got older and more experienced, they would prefer to conform to the regulations and stay away from troubles with tax authorities. Subjects who expressed their future willingness to expand their projects had 2.79 times the odds to comply with the nudge than the other subjects. For the rest of the variables in our regression model, they had insignificant impact on our dependent variable (see [Table 2](#)).

4.3.2 Treatment 2: networking nudge. In the second informational nudge, we offered the subjects in the second treatment group a different piece of information and asked them if that would affect their willingness to register their businesses. The information is: **“Do you know that the MSME will help you sell your product through connecting you to large enterprises that use your final product in their production process and that this service is free of charge? Would this piece of information affect your decision to register your business?”**.

In the second treatment, we hypothesize the following:

H2. Upon receiving the networking nudge, the informal entrepreneurs will be more willing to formalize the business.

Variable		Frequency	Percentage
Gender	Male	173	72.1
	Female	66	27.5
Marital status	Single	83	34.6
	Married	145	60.4
	Divorced	8	3.3
	Widow	4	1.7
Age	20 to 30	71	29.6
	30 to 40	87	36.6
	40 to 50	58	24.2
	50 to 60	23	9.6
Education level	No high school certificate	15	6.3
	High school	8	3.3
	Diploma (2 years)	113	47.1
	Bachelor's degree	104	43.3
Years of experience	Less than 5 years	42	17.5
	5–10 years	74	30.8
	10–15 years	61	25.4
	More than 15 years	63	26.3

Table 1.
Descriptive statistics
for the survey sample

Source(s): The table is constructed by author

DTF	Coefficient B	Odds ratio	$P > z$ [95%	Formalization of the Egyptian informal sector
Finance nudge	1.371*** (0.468)	3.94*** (1.84)	0.003	
Gender (Male)	-0.092 (0.511)	0.911 (0.46)	0.856	
<i>Marital status (Married)</i>				
(Single)	-0.128 (0.500)	0.879 (0.43)	0.797	
(Divorced)	-0.498 (1.438)	0.607 (0.87)	0.729	
<i>Age (Less than 30 years)</i>				
(from 30 to 39 years)	0.679 (0.553)	1.972 (1.09)	0.219	
(From 40 to 49 years)	0.426 (0.663)	1.531 (1.01)	0.520	
(From 50 to 59 years)	-1.435 (0.978)	0.238 (0.23)	0.143	
<i>Education (Bachelor's degree)</i>				
(No high school diploma)	0.869 (0.823)	2.385 (1.97)	0.294	
(High school diploma)	-0.581 (1.019)	0.558 (0.569)	0.568	
(2 years diploma after school)	-0.038 (0.445)	0.962 (0.42)	0.931	
<i>Experience (less than 5 years)</i>				
(From 5 to 10 years)	0.2938 (0.592)	1.341 (0.79)	0.620	
(From 10 to 15 years)	-0.568 (0.665)	0.566 (0.37)	0.393	
(More than 15 years)	-0.471 (0.870)	0.624 (0.54)	0.588	
<i>Project Age (less than 5 years)</i>				
(More than 5 years)	2.17** (0.963)	8.777*** (8.45)	0.024	
Location (located at home)	-0.17 (0.441)	0.841 (0.37)	0.696	
Expand_Project (Willingness to expand the project)	1.02** (0.473)	2.797 (1.32)	0.030	
Constant	-1.017 (0.782)	0.361 (0.28)	0.193	
Pseudo R2	13.07%			
LR χ^2	27.80			
Prob > χ^2	0.0018			
Note(s): Numbers reported in the table represent logistic coefficients. Robust standard errors in parentheses. *** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$				
Source(s): The table is constructed by author				

Table 2.
Treatment effects (control vs finance); dependent variable compliance

The following table shows the results of the regression. The model hits a classification accuracy of 65%. The omnibus tests of the model coefficients indicate a significance value of 0.001, which shows that at least one of the variables are statistically significant with a $\chi^2 = 30.62$. The pseudo R2 denotes that at least one of the variables in the regression equation explains 19.2% of the variability in the compliance of the subjects (see Table 3).

In the second regression, the age variable was found to be statistically significant so that the subjects falling in the age bracket from 40 to 49 were found to have 3.23 times the odds to comply with this informational nudge rather than subjects less than 30 years old (our reference category). The subjects who fall in the age bracket from 50 to 59 had 5.14 times the odds to accept the formalization decision. The subjects who were willing to develop their businesses reacted positively as they had 1.38 times the odds to comply with the nudge. Informal entrepreneurs who established their business at home exhibited less odds to conform to the nudge as the odds ratio was less than 1 (0.38). This figure can be interpreted the other way ($1 \div 0.38$) = 2.7, meaning that informal entrepreneurs who had a location for their businesses other than home exhibited 2.7 times the odds to comply with the nudge than the entrepreneurs managing their businesses from home. The rest of the variables in the regression equation were found to be statistically insignificant (see Table 3).

To sum up, the first treatment created incentives for the informal entrepreneurs to register their businesses through giving them information about the finance initiative announced by

REPS

DTF	Coefficient B	Odds ratio	p-value
1. Networking_nudge	0.608** (0.455)	1.836** (0.788)	0.074
Gender (male)	0.281 (0.536)	1.032 (0.710)	0.600
<i>Marital status (Married)</i>			
(Single)	0.452 (0.535)	1.477 (0.640)	0.369
<i>Age (less than 30 years old)</i>			
(From 30 to 39)	0.543 (0.499)	1.626 (0.802)	0.277
(From 40 to 49)	1.175** (0.665)	3.238** (1.270)	0.079
(From 50 to 59)	1.637** (0.871)	5.14** (2.507)	0.060
<i>Education (Bachelor's degree)</i>			
(No high school diploma)	-0.836 (0.817)	0.944 (0.826)	0.253
(High school diploma)	0.964 (1.210)	1.110 (1.284)	0.387
(Diploma 2 years after school)	-0.462 (0.394)	0.439 (0.410)	0.284
<i>Experience (Less than 5 years)</i>			
(From 5 to 10 years)	-0.437 (0.566)	0.121 (0.599)	0.839
(From 10 to 15 years)	-0.118 (0.612)	0.882 (0.541)	0.838
(More than 15 years)	-0.317 (0.68)	0.546 (0.455)	0.469
<i>Project Age (less than 5 years)</i>			
(more than 5 years)	0.128 (0.387)	1.171 (0.437)	0.672
Location (located at home)	-0.96* (0.605)	0.380* (0.171)	0.010
Expand project (willingness to expand the project)	1.261** (0.489)	1.379** (0.171)	0.032
Constant	0.375 (0.489)		
Pseudo R2	0.192		
LR χ^2	30.62		
Prob > χ^2	0.001		

Table 3.
Treatment effects
(control vs networking)
dependent variable
compliance

Note(s): Numbers reported in the table represents logistic coefficients. Robust standard errors in parenthesis, * $p < 0.05$
Source(s): The table is constructed by author

the MSME. The second treatment created incentives through giving information about the networking service offered by the MSME. In the first informational nudge, the idea of facilitating finance to the informal entrepreneurs resulted in 54 compliers. The second nudge resulted in 49 compliers who expressed their willingness to register their business and join the formal sector. The results of this experimental survey confirm that finding a source of finance and marketing the products are two obstacles that face informal entrepreneurs and discourage them from joining the formal sector. The results also show that changing the mindset of people is possible if a proper channel of communication is created between the government and the business owners. During the experiment, it was noticed that many subjects did not have precise or correct information about the MSME services. Indeed, many of them thought that applying for loans would be a very complicated and costly process. In addition, they did not know about the free online courses on how to make a feasibility study or do the business accounting. The incompleteness of information available to the subjects in our experiment proves that the formalization decision is subject to the constraints of bounded rationality. Helping the decision maker set a correct reference point and framing the outcome of the formalization decision as gains by providing the information will catalyze the formalization rate in the Egyptian economy.

5. Conclusion and policy implications

In explaining why informal entrepreneurs choose to join the formal market, previous research has primarily focused on the rational cost-benefit analysis of the incentives of formalization. This approach fails to explain why some informal businesses accept the formalization decision, while others, sharing similar characteristics and operating under the same market and regulatory conditions, reject it. Empirical research has proven that formalization initiatives, which were designed on the basis of the rational-actor model, have yielded limited success as researchers have found insignificant increase in the levels of formalization in response to changes in these incentives. Drawing on these findings, this article has employed a behavioral perspective by focusing on the bounded rationality of individuals as the main determinant of the formalization decision.

The different levels of aspiration between informal entrepreneurs result in different reference points in judging the formalization decision. A growth-oriented informal entrepreneur will be attentive to the informational nudges as he aspires to expand the scale of the business, which in turn creates an incentive to join the formal market. On the contrary, a survival-oriented informal entrepreneur is keen to preserve his network of suppliers and customers in the informal market as he aspires to only survive the business and keep his legitimacy among the informal market stakeholders. Proper communication and framing of information to the risk averse informal entrepreneurs, will change the reference points upon which they base their decision. This in turn will raise the formalization rates in the Egyptian economy.

In addition, the formalization decision is affected by structural and opportunity factors. Whereas structural factors include institutional regulations and the ability of governmental institutions to enforce law and enhance market efficiency, opportunity factors refer to individual characteristics, societal background, education and business experience, all of which affect the perception and aspirations of the informal entrepreneurs. In this context, this study suggests designing new initiatives that incentivize informal entrepreneurs to join the formal market. The “one initiative fits all” approach usually results in a limited success as it overlooks the heterogeneous nature of the informal entrepreneurs (different societal background, different education, market experience and different aspirations). As such, policy makers need to target certain communities that contain a high percentage of informal activities and design initiatives that accommodate their aspirations and challenges. For example, initiatives that target survival-oriented entrepreneurs can include (1) low registration fees and tax exemption for a certain period of time, (2) free training courses to enhance their business skills to better manage the business after joining the formal sector, (3) offering special training and assistance to people with little or no education to help them better understand the registration process and follow up the business. Meanwhile, initiatives targeting growth or opportunity-oriented entrepreneurs can include (1) decreasing the cost of information search, (2) providing loans at discounted interest rates, (3) providing tax incentives to enhance tax compliance. We suggest targeting a whole community of informal entrepreneurs at a time so the decision-maker would not feel resisted by the surrounding community.

This study, nevertheless, has encountered two main limitations. First, it measured the willingness of an informal entrepreneur to formalize his/her business, i.e. the future intention to formalize and not the actual action. There is no guarantee that the surveyed subjects who showed willingness to formalize would take the necessary action to formalize their businesses. Second, the time lag between taking the actual decision and carrying out the registration procedures is another factor that has not been included in the analysis. This limitation should be addressed in future research by controlling for an individual’s preference to convert goals to actions. Future studies can focus on studying the factors that decrease the incongruence between the formal and informal institutions to minimize the gap between both

sectors and enhance formalization. Experimental research can be used to investigate the factors that induce change in the informal market mechanism to support the inertia of the formalization process. A better understanding of the formalization decision should translate into better targeted formalization policies and initiatives.

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