Discussion Paper Series

RIEB

Kobe University

DP2024-14

Informality and Dynamism of Microbusinesses in Africa: Possible Causalities

Hiroyuki HINO
Nobuaki HAMAGUCHI
Charles PIOT
Jiahan YIN

March 29, 2024

Research Institute for Economics and Business Administration
Kobe University
2-1 Rokkodai, Nada, Kobe 657-8501 JAPAN

Informality and Dynamism of Microbusinesses in Africa: Possible Causalities [1]

Hiroyuki Hino, Nobuaki Hamaguchi, Charles Piot, and Jiahan Yin[2]

Abstract

This paper attempts to gain greater clarity about an issue which has considerable bearing on economic policy in Africa yet remains poorly diagnosed: the relation between informality and dynamism among low-income micro enterprises. We begin with the premise that micro entrepreneurs are driven by non-pecuniary motives, to varying degree, and adopt informal ways of doing business when informal motivations are strong. Building on this premise, we construct a regression model in which the dynamism of microenterprises is explained by the informality of entrepreneurs' motivations and of his/her ways of doing business as well as interactions among these two informality variables. We apply the model to microentrepreneurs in Ghana, Kenya and Nigeria, with data derived from a survey conducted for this research. The regression results show that the relation between informality and dynamism is intricate. Two of the four informal business practices tested - small business size and limited bookkeeping – negatively affect business growth while the other two have no significant influence either way. On the other hand, informal motivations – represented by a composite index of non-pecuniary motivations – have a positive effect on business growth although the effect is not directly observable. When an enterprise is operated in an informal setting by an entrepreneur with strong informal motivations, the synergy between the setting and the motivation works to increase the chance of business growth. The resilience of microenterprises too is linked positively to informality although interactions between motivation and business practice tend to reduce business growth in this case. Informal motivations and informal business practices are interwoven, an insight that could help in developing policy that could strengthen informal enterprises on the continent.

Key Words: Informality, Africa, Microenterprises, Growth, Resilience

JEL: O55, O17, Z13

[1] This paper is the second of the Duke Africa Initiative Series on the African informal economy. The first paper, "Rethinking the Informal Economy in Africa," challenges many of the assumptions made in the literature about African informality. A third paper applies Multiple Correspondence Analysis (MCA) to construct a composite index of informal practices. It is being finalized concurrently. This study is supported by the Kobe University Strategic International Collaborative Research Grant (Type C Creating Joint Research).

[2] The authors are, respectively, Visiting Research Scholar, Office of Global Affairs, Duke University and Research Fellow, Research Institute for Economics and Business Administration (RIEB), Kobe University; Professor of Economics, RIEB, Kobe University; Professor of Cultural Anthropology and African & African American Studies, Duke University; and Graduate Research Assistant, Department of Economics, Duke University. We acknowledge with deep gratitude guidance and support we received from Praful Patel, former Vice President of the World Bank. The authors are grateful to the other members of our research team—Lilly Brouwer, Iftekhar Jamal, Wanrong Deng, Patrick Crotty, and Tian Chen, all of whom made significant contributions at earlier stages of this research.

1. Introduction

The informal economy in Africa has been the subject of extensive studies by development economists and cultural anthropologists, among others. Development economists generally see the informal as that which does not conform to the institutional norms of economies in the West. By contrast, anthropologists tend to see the informal in precarious African economies as normative, and often highlight the dynamism and resilience of informal entrepreneurs.

This paper attempts to generalize the findings of anthropologists through quantitative analyses of a large number of owner-operators of low-income microenterprises in Ghana, Kenya and Nigeria. A survey was conducted specifically to collect data for this analysis.

To model the informal economy for our analysis, we postulate the following:

1) Informal entrepreneurs, as anthropologists suggest, are motivated by the desire to: (a) remain free of institutional constraints and obligations and pursue their own goals; (b) prepare for adversity and crisis, whether natural or economic; (c) rely on the trust of family and friends in operating their businesses; and (d) acquire recognition for their work within their communities.
2) Informal business practices commonly cited in the literature are the result of choices that informal business owners make, importantly derived from the above non-pecuniary motives. For modeling purposes, we select the following practices: bookkeeping, compliance/non-compliance with government regulations, owner-operated business with one or two workers, and location/venue of business, all commonly cited as definitions of informal business in the literature.
3) Key outcomes of operating businesses, such as growth of revenue, are determined not only by education, availability of ICT and other factors commonly cited in growth regressions but also by the non-pecuniary motives mentioned above. In our model, we examine two outcomes that are often hailed by anthropologists as hallmarks of informal business: growth and the resilience of their business.

We will test these postulates by OLS and ordinal logit regressions, with both independent and dependent variables derived from the African Informal Entrepreneurs Survey (AIE). The AIE survey was conducted by ASA-International, a micro finance institution listed in the London Stock Exchange, in partnership with Duke University's Africa Initiative (Duke-AI). Of the more than 500,000 recipients of ASA-I's micro-loans in Nigeria, Ghana and Kenya, 1,500 were selected randomly for this study, 500 in each country. The questionnaire was designed jointly by the local offices of ASA-I and Duke-AI for the purposes of this research, and responses were collected by in-person interviews conducted by ASA-I loan officers.

The significance of non-pecuniary motivations in explaining informal business practices and business outcomes will be tested with each motive as an independent variable and also with the four non-pecuniary motives bundled into a single variable, what we call a composite informal motivation index (CIMI). As explained below, a microentrepreneur's four-dimensional

motivation is captured graphically as a quadrilateral with each axis representing the degree of informality of each non-pecuniary motive and CIMI is derived from it. We will see that CIMI and each of the four non-pecuniary motives are partially effective in explaining aspects of informal business practices and business outcomes.

Similarly, each of the four business practices—bookkeeping, compliance with government regulation, business size, and location/venue of business—are categorized by the degree of assumed informality (fully compliant, usually compliant, sometimes compliant, rarely comply, never comply). The correlation with growth and resilience is tested with each business practice as an independent variable.

The rest of this paper is organized as follows: Literature review (Section 2); Data (Section 3); Modeling the informal economy (Section 4); Informality and resilience of the microenterprise sector (Section 5); Research questions (Section 6); Regression models and results (Section 7); and Conclusion (Section 8).

2. **Literature Review**

There are two broad threads in the literature on the relationship between informality and dynamism. One comes from cultural anthropology and focuses on cultural values and motivations, and the other from development economics, which generally approaches the informal economy with the framework of neoclassical economics.

In cultural anthropology, based on close observation of African communities over many decades, researchers have found that the norms with which microentrepreneurs operate in sub-Saharan Africa are rooted in societal and cultural values, in vernacular economic practices, and in histories of resistance to colonial and postcolonial rule. Informal norms instill and value autonomous decision-making and flexibility in responding to domestic and commercial needs, while drawing on social and kin networks to further business aims and access liquidity. Anthropologists suggest that informal norms of African microentrepreneurs are not antithetical to formal business norms found in the West, and that they can produce dynamism and resilience.

Japanese anthropologist Sayaka Ogawa (2016) studied large samples of small-scale merchants in urban centers in Tanzania over many years and found that actors in those sectors value/experience the same three principles, namely: (i) uncertainty, which leads to livelihood diversification and gifting; (ii) social recognition more than monetary gain; and (iii) trust in personal relations. Another anthropologist, Misa Hirano (2021) collected 120 life histories of informal enterprises in Yaoundé, Cameroon, and suggests that actors in the informal sector easily move between the informal and the formal economy; often start businesses that fail, before beginning to recover; share money and work among relatives and peers; and, importantly, prefer independence to working in a formal environment. Both scholars conclude that informal enterprises are dynamic.

In development economics, views about the dynamism of informal enterprises have generally been more subdued and less enthusiastic. The following quote from La Porta and Schleifer (2014, p. 109) may be representative: "We argue that the evidence is most consistent with dual models, in which informality arises out of poverty and the informal and formal sectors are very different. It seems that informal firms have low productivity and produce low-quality products… Economic growth comes from the formal sector, that is, from firms run by educated entrepreneurs and exhibiting much higher levels of productivity … A few informal firms convert to formality, but more generally they disappear because they cannot compete with the much more-productive formal firms." In La Porta and Schleifer (2014) and others in the field of development economics, the informal economy is defined by variants of the original definition offered by economic anthropologist Keith Hart, viz, "income-generating activities outside the regulatory framework of the state" Hart (1973 [1971]: 61).[3]

Since La Porta and Schleifer (2014), there has been some credible quantitative work that supports a more positive view of informal enterprises. For example, Fourie (2019) analyzed own-account or self-employed workers in South Africa as enterprises rather than employment. With regression analyses relying on data from the Survey of Employers and the Self-Employed (SESE), he showed significant employment expansion by one-person and multi-person informal enterprises as well as mobility from the informal to the formal sector. In addition, the analysis showed that industry type, years in business, location of business, accounting, gender of owner, and educational attainment are correlated with business performance. According to the author, this was the first quantitative, enterprise-based study focusing on the employment dynamics of informal enterprises in sub-Saharan Africa.[4] Aim and Islam (2015) found robust evidence that small informal firms have higher labor productivity that large formal firms.

Nevertheless, negative assessment of informality remains prevalent in the development economics literature. In a major publication on the informal economy (Ohnsorge, F. and Yu, S., 2022), the World Bank maintains that the more informal a country, the lower the country's development indicators are across the board. "Widespread informality has long been associated with a whole host of development challenges … Most prominently, more widespread informality has been associated with significantly poorer governance and greater lags in achieving every dimension of the Sustainable Development Goals. Countries with larger informal sectors tend to have less access to finance for the private sector, lower labor productivity, slower physical and human capital accumulation, and smaller fiscal resources"

[3] For definitions of informality used in development economics, see Maloney (2004), Chen et al (2012), Meagher and Lindell (2013), Amin and Islam (2015), Charmes (2016), Losby, et al (2002), OECD and ILO (2019), among others.

[4] A positive assessment of the informal is offered in Amin and Islam (2015) and David, Diallo and Nilsson (2023)

(Ohnsorge, F. and Yu, S., 2022, p.25).[5] These negative views are shared at least in part by a number of other development economists, including Elgin et al (2021) and others.[6]

It is difficult to validate the sweeping assessment of the informal by the World Bank's report as part of this literature review because of the methodological differences as well as the Bank's focus on economic performance at the country level. Nevertheless, if we narrow the formal vs informal comparisons to the performance indicators of informal enterprises, our data largely collaborates the claims in the Bank's report but also challenges a few critical propositions. Specifically, if the micro enterprises in our survey are divided into formal and informal groups using a comparable attribute (compliance with government regulations), our data show that labor productivity of the informal group is significantly higher than that of the formal group. See Appendix Table I. Moreover, as shown in Appendix Table II, if frequency of tax payment is used to define informal enterprise, labor productivity of the informal group falls as that the group is broadened to include less informal (more formal) enterprises.[7]

Finally, as discussed below, our regression analysis finds that lesser compliance with government regulations (greater informality) is linked to lower revenue growth, consistent with the claim in the report by the World Bank and other papers. However, if interactions between informal motivations and ways of business are introduced in the regression equation, the significance of the coefficient on compliance with government regulations disappears. Instead, small business size and limited bookkeeping emerge as significant explanatory variables with negative correlation. We should be careful about this negative correlation though because apparently the synergy between business size and informal motivations and also between regulatory compliance and informal motivations influence revenue growth positively (i.e., the interactions terms have significant and positive coefficients.) These findings suggests that the negative view of informality is sensitive to how informal enterprises are defined and selected for analyses.

The above summary of the literature clarifies the relation between this paper and the existing literature. First, this paper attempts to bridge the research in cultural anthropology and that of development economics. We do so by integrating their respective theses in a model of the informal economy. Second, no quantitative studies we know of have approached informal business as an outcome of business decisions that reflect personal preferences (attributes) of owner-operators of microbusinesses.[8] We have the data required for such analysis, thanks to

[5] However, in its World Development Report 2013, the World Bank (2013) embraced informal activities.
[6] Others paper with negative views are Fayomi et al (2018) and Medina et al (2017).
[7] While a majority of researchers adopt a binary approach in defining informality, it is increasingly accepted in the literature that informality is a matter of degree and is better thought of as lying on a continuum, ranging from formal to informal. (See for example, Chen and Meagher (2012))
[8] For a more conventional business decision model of informal enterprises, see Amaral and Quintin (2006).

the AIE survey. Finally, this paper offers a careful reassessment of the dominant view in development economics that informal enterprises are inferior to formal enterprises.

3. Data

Data required for our analysis are derived primarily from a survey of owner-operators of low-income micro businesses (AIE Survey) that was conducted by the ASA-International in partnership with the Duke Africa Initiative (DAI). The survey was carried out in Kenya, Ghana and Nigeria in May and June 2021. ASA-I's corporate database was used as a secondary source to supplement the primary data.

Five hundred (500) respondents were selected in each country from a large pool of recipients of loans from ASA-I (over 100,000 in Kenya, 150,000 in Ghana, and more than 250,000 in Nigeria). Loan recipients were low-income owners of micro businesses and were all female.

A stratified random sampling methodology was employed. Data from existing surveys were used to estimate the geographic distribution of micro enterprises in each of the countries. The client base of ASA-I's regional offices was used as the sampling frame, and the number of respondents from each region was determined proportionate to the regional distribution of micro-enterprises in the country.

For each country, 25 loan officers were selected from local offices to serve as enumerators and 20 of their clients were assigned to each loan officer. They were trained to conduct interviews professionally.

The survey questions encompassed: (a) owner-operators' personal and institutional attributes; (b) size, sector, revenue and other characteristics of their businesses; (c) growth, diversification and dynamism of their enterprises; and (d) compliance with government regulations, trust, and other features that are conventionally associated with informality in the literature. The impact of the Corona-19 pandemic on these micro-enterprises, and their response, was also addressed.

The collected responses underwent quality control at ASA-I's country head offices and were uploaded to an excel file. The files were further cleaned up at ASAI's Global HQ. Missing values in individual responses were identified at Duke, and consistency of answers across different questions was checked. Duplicate responses were identified and removed. Finally, some questions were reformatted for ease of reference in the final datafile. The cleaned dataset consisted of 1372 respondents, although the number of valid responses varied across questions, at times dropping to less than 1000.

Note that our data is not free of sampling bias. Our samples are all female. Moreover, while ASA-I operates in many regions and sub-regions in all three countries, some areas are not covered in their operation, and hence are not in the survey. In addition, services and trade are over-represented in our samples for Ghana and Nigeria. In both countries, our samples show

very small shares of micro enterprises in agriculture and manufacturing while the share of both are substantial in national samples. [9]

4. Modeling the informal economy

The data described above allows us to construct and test a model where a low-income entrepreneur owns her firm and operates it according to her own motives. She chooses the venue and their own way of doing business (e.g., whether to keep written records or not), taking into account the infrastructure, locations of customers, access to materials and so on. In this model, owner-operators' personal attributes (motives) affect business outcomes directly and also indirectly through the choice of the ways of doing business (business practice).

For our regression model, we adopt:

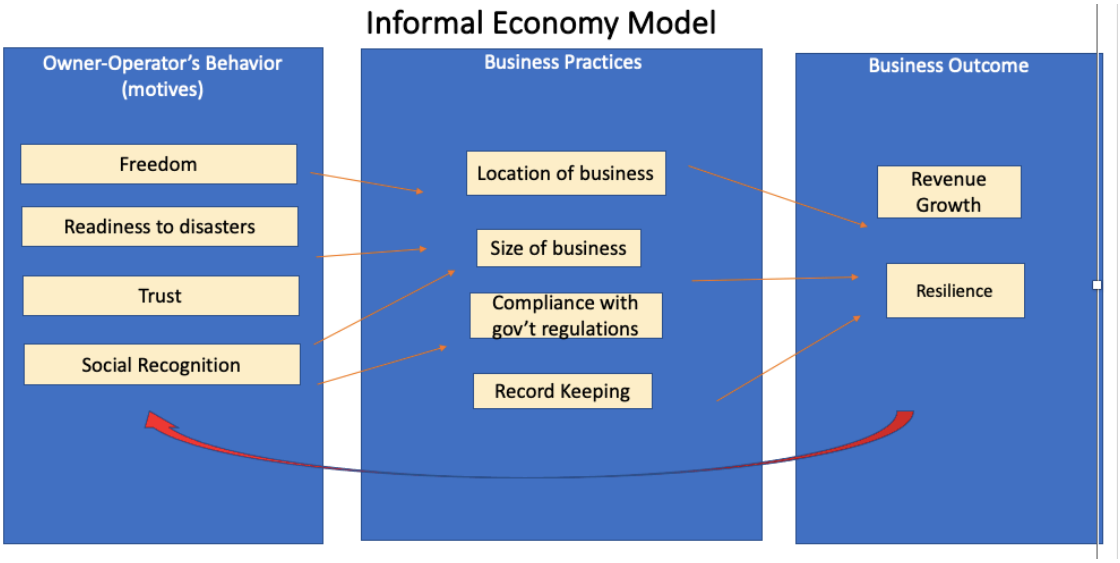
(a) **Four non-pecuniary motivation variables**, namely, the desire to: (i) be free of institutional constraints and obligations; (ii) prepare oneself for adversity; (iii) rely on kin and friends; and (iv) be socially recognized. We assume that these motives constitute the core of personal attributes of owner-operators of low-income microenterprises in Africa. The stronger these motivations, the greater the deviation of the behaviors of microentrepreneurs would be from the norm in a developed economy in the West. We construct these motivation variables as ordinal categorical variables from responses in our survey, each category representing an ascending degree of informality.

(b) **Four business practice variables**, namely, (i) location/venue (e.g., a workshop in a shared space), (ii) organizational structure (e.g., the owner plus one worker), (iii) compliance with government regulations (e.g., rarely comply), and (iv) bookkeeping (e.g., partial and irregular). While a number of business practices are used in the literature to define informality, we select these four to keep our regressions manageable and also because they are the most commonly used. We construct the four business practices as ordinal categorical variables, from least informal to most informal.

(c) **Two business outcome variables**, namely, (i) the rate of growth of sales revenue in the last five years, and (ii) resilience to major negative shocks. We adapt the concept of a "Resilience Triangle," an established model in civil engineering, to our case and draw "Resilience Quadrilateral (RQ)" for each entrepreneur from the speed with which the business revenue declined during the Covid-19 pandemic and the pace at which it recovered.[10] From RQ, we construct an "Informality Resilience Index (IRI)," that ranges from -1, being least resilient (complete loss of functionality), to 0, being fully resilient (no loss of functionality). We use IRI as a dependent variable, together with growth of revenue, to capture the dynamism of microentrepreneurs.

[9] For a more detailed presentation of the survey methodology, see Brouwer and Iftekhar (forthcoming).
[10] The impact of Covid-19 pandemic has of course been covered very extensively. See, for example, Aditya1 and Amri (2023), which includes a discussion of coping mechanisms by informal enterprises.

Our model is represented in the chart below.



The above variables are derived from responses to the corresponding questions in the AIE survey as follows: The survey questions and responses are presented in Table 1 and 2 on this and the next page.

Table 1: Motivation of low-income micro-entrepreneurs

	Kenya	Ghana	Nigeria	Total	# of observations
Reliance on informal relations in operating business (% of respondents who answered very much or somewhat)					
Immediate family	61.44%	40.38%	34.90%	46.35%	1288
Close relatives	34.60%	30.87%	35.65%	33.47%	1225
Neighborhood community	53.17%	28.80%	47.97%	42.77%	1169
Religious group	49.53%	37.47%	42.60%	43.04%	1285
Ethnic group	38.00%	25.45%	29.01%	30.91%	1291
Government	29.68%	12.95%	5.82%	16.78%	1341
Strangers	49.89%	10.68%	15.94%	25.58%	1298
Participation in group activity (weighted average) scale of 1 (not at all active) to 4 (very active)					
Religious group	3.42	3.13	3.23	3.26	1306
Neighborhood group	3.21	2.27	1.98	2.5	1254
Political group	2.12	1.57	1.69	1.8	1205
School friends	2.4	1.87	2.05	2.11	1221
Other	1.94	1.65	1.79	1.67	530
Advantages of having own business (% of all responses to question)					
Full control of business	83.69%	76.50%	93.11%	84.03%	1315
Free to innovate and introduce new products	70.97%	69.40%	48.21%	63.65%	1315
Earn extra income	59.75%	47.89%	36.73%	48.82%	1315
Work from home	47.03%	47.67%	20.66%	39.39%	1315
Opportunity to develop skills	52.75%	29.71%	26.79%	37.11%	1315
Own boss	36.65%	33.26%	47.19%	38.63%	1315
Other	43.22%	33.48%	39.54%	38.78%	1315

Table 2: Informal Business Practices

	Kenya	Ghana	Nigeria	Total	# of observations
Business location (% of all responses)					
Commercial building	39.19%	29.68%	40.79%	36.25%	1327
Workshop in a shared area	8.47%	10.32%	25.00%	13.87%	1327
Public market with a mobile unit	23.31%	30.53%	17.11%	24.11%	1327
Street or other open space	16.31%	29.47%	9.21%	18.99%	1327
Private farm (owned or leased)	10.17%	2.11%	5.79%	6.03%	1327
Public farming or grazing land	1.91%	0.00%	0.79%	0.90%	1327
Own home	18.01%	21.05%	2.37%	14.62%	1327
Other	2.97%	2.32%	1.84%	2.41%	1327
Number of workers, including owner					
Median	1	1	2	2	1250
Mean	2.2	1.93	3.29	2.45	1250
Lowest 10% (average)	1	1	1	1	1250
Largest 10% (average)	4	4	6	4	1250
Record keeping in writing (% distribution)					
Detailed and systematically	26.22%	19.96%	59.06%	33.33%	1320
Detailed but not systematically	24.95%	10.81%	11.17%	16.35%	1320
Keep some record	18.81%	10.81%	10.17%	13.71%	1320
Minimal	16.64%	19.54%	7.94%	15.17%	1320
No written record	13.38%	38.88%	11.66%	21.43%	1320
Compliance with government regulations					
Fully/mostly	89.37%	57.36%	49.12%	66.06%	1320
Partially	5.64%	14.07%	17.63%	12.20%	1320
Rarely/none	3.25%	23.59%	4.79%	10.83%	1320
Not Sure	1.74%	4.98%	28.46%	10.91%	1320

Behavioral motivation variables

- ***Desire to be free***: The AIE survey included the question, "What are the main advantages of having your own enterprise?" and respondents were asked to check-mark answers that applied to them. For the freedom variable, we selected two from the list of responses, i.e., "You are in full control of your business" and "the fact that you are your own boss." The entrepreneurs who check-marked either or both of these answers apparently prefer to be free to do what they wish rather than being constrained in a formal work environment; they are thus considered informal. Accordingly, we assign 1 to the entrepreneurs who check-marked either or both of these answers and 0 to those who did not. Indeed, almost of all of the respondents want to own businesses and do so in order to have full control – in 93% of our samples in Nigeria, 83% in Kenya and 76% in Ghana.

- ***Desire to rely on kinship and personal trust*:** The survey includes a question, "How much do you rely on the following people in conducting your business?" A number of relationship categories were listed, ranging from "immediate family" to "strangers," and for each category, respondents were asked to check-mark one from "not at all; "not very much," "somewhat," and "very much." From the list of categories, we selected

"immediate family," "close relatives," and "neighborhood community," because we presumed that the relationship with people in these groups was informal and involved personal trust. We constructed the trust variable by assigning 0 for "not at all," 3.33 for "not very much," 6.67 for "somewhat rely on," and 10 for "rely on very much," for each category and took a simple average of the three scores. Large proportions of Kenyan micro entrepreneurs rely either very much or somewhat on immediately family and neighborhood communities while the reliance on these personal relationships is much less in Ghana and Nigeria, though still significant.

- ***Desire to be prepared to deal with severe adversity***: The question about the advantage of owning one's own business also includes, "You are free to innovate and introduce new products," and "Earn extra income," as possible responses. We use these answers as a proxy to gauge an entrepreneur's awareness of disaster risks and construct the readiness to disaster variable by assigning 1 to those who check-marked either or both of the above answers, and 0 to those who did not. This measure is far from ideal. However, we cautiously accept it partly because the proposed measure indicates that Kenyan micro- entrepreneurs are more conscious of disaster risks than their Nigerian counterparts and this is consistent with the frequency of drought and other natural disasters in each country. A large majority of the samples in Kenya identified, "free to innovate and introduce new products," and "earn extra income," as advantages of owning one's own business, while in Nigeria, it was a minority that did the same; Ghana was in between.

- ***Desire to be socially recognized***: The AIE survey does not ask directly how strongly the respondents desire to be socially recognized. There is, however, a question about how active respondents were in various social and political groups. The survey shows that our sample entrepreneurs were, as a whole, fairly active in neighborhood communities and religious groups in Kenya (score of 3.2 – 3.4 on a scale of 1 to 4) and in religious groups in Nigeria and Ghana (score of 3.1 – 3.2). The entrepreneurs who are active in neighborhood communities and religious groups may not necessarily be motivated by a desire to gain social recognition for their business activity. Nevertheless, if an entrepreneur is active in those groups, she may well be influenced in her business decisions by considerations beneficial to those group activities and thus deviate from the neoclassical dictum of profit maximization or other European business norms. Those entrepreneurs may be considered informal in that sense. On this basis, we constructed the social recognition variable by assigning to a respondent 0 for "not at all," 3.33 for "not very much," 6.66 for "somewhat active," and 10 for "very active," in each question and taking a simple average of both.

<u>Business practice variables</u>

- ***Location of business***: In the literature, the location or venue of business is widely used to define informal business. The AIE survey includes a question, "Where do you operate your business?" and respondents were given seven locations/venues to choose from. We group these locations into three categories in order of presumed informality (from least to most) - 1: commercial building and private farm; 2: workshop in a shared area and own home; and 3: street, public market with mobile unit and public farm. This grouping is used to make a business location variable for our regression. About one half of the micro enterprises operate in those areas or venues that are most informal while, surprisingly, an almost equally large number of micro enterprises operate in locations that are considered formal.

- **Sole owner-operator:** In the literature, it is widely presumed that an informal entrepreneur prefers to own her own business and operate it alone or with one or two apprentices. The AIE survey includes a question on ownership structure as well as the number of workers, including the owner. For our model, we construct the owner-operator variable by assigning 1 if the number of workers of an enterprise is less than or equal to 2, including the owner, and 0 if the number of workers is greater than 2. According to our survey, the median of the number of workers is 1 (i.e., the owner alone) in Kenya and Ghana, and 2 in Nigeria (i.e., an owner plus one worker) although the number of larger enterprises is not insignificant.

- **Recordkeeping**: The extent of bookkeeping is widely cited as an indicator of informality. The AIE survey includes a question, "To what extent do you record your business transactions in writing?" and gives respondents five answers to choose from. For our model, we constructed the record keeping variable by grouping these choices into three categories in order of presumed informality (from least to most) - 1: Detailed and systematically + detailed but not so systematically; 2: Somewhat detailed + keep records but not detailed; and 3: No written records. The AIE survey shows that bookkeeping is far more extensive than commonly assumed in the literature. In Kenya and Nigeria, a majority of micro enterprises keep detailed accounts in writing and only about one quarter keep no or minimal accounts. The micro-enterprise sector in Ghana is more informal than in the other countries according to this indicator, with a clear majority of respondents keeping no or minimal records.

- **Compliance with government regulations**: The AIE survey includes a question, "Does your business comply with government regulations?" and gives respondents six answers to choose from. See Table 2. For our model, we construct the compliance variable by grouping these choices into three groups in order of presumed informality (from least to most) - 1: Fully comply + mostly comply; 2: Partially comply; and 3: Rarely comply + don't comply + Not sure. According to the AIE survey, about one half of micro enterprises in Ghana and Nigeria fully or mostly comply with government regulations while the remainder are distributed among partially complying, or rarely/none, or not

sure. In Kenya, however, about 90% of samples fully or almost fully comply, suggesting that according to this indicator, the micro-enterprise sector is hardly informal.

Business outcome variables

- **Revenue Growth:** In the AIE survey, respondents were asked, "How much has your business revenue increased/decreased in the last five years?" They were asked to choose from 5 ranges. The revenue growth variable was derived directly from the answers as discrete numeric variables as follows - 0: decreased >30%; 2.5: decreased 10-30%; 5: about the same; 7.5: grown 10-30%; and 10: grown >30%. About 20% of micro-enterprises in the AIE survey increased their revenue by more than 30% over the last 5 years while fewer than 10% lost revenue by more than 30%. See Table 3 below. This certainly is not consistent with the pessimistic view advanced in the literature. The question is whether this positive revenue performance is correlated with the informality of owner-operators.

- **Resilience**: The AEI Survey also asked respondents, "How much income have you lost or gained, either directly or indirectly, as a result of the Coronavirus outbreak?" and "How well has your business recovered from the Coronavirus?" Table 3 shows that more than 25% of micro-enterprises did not lose revenue during the Covid-driven economic downturn; about 10% of microenterprises even increased their revenue by at least 10%. We also see that about 20% of microenterprises surpassed their pre-Covid revenue levels by at least 30% during the recovery phase. We capture this apparent resilience of low-income microenterprises by an Informality Resilience Index (IRI) and use this index to represent resilience in our model as a continuous numeric variable ranging from minus 1 (no resiliency) to 0 (full resilience). See Appendix III for a note on the derivation of IRI.

Table 3: Dynamism of Microenterprises

	Kenya	Ghana	Nigeria	Total	# of observations
Revenue growth/decline over the last 5 years (% distribution)					
Decreased by 30% or more	11.76%	11.97%	4.64%	9.85%	1310
Decreased by 10-30%	25.63%	26.50%	3.83%	19.85%	1310
About the same	20.17%	19.23%	27.87%	21.98%	1310
Increased by 10-30%	22.69%	18.59%	42.08%	26.64%	1310
Increased by 30% or more	19.75%	23.72%	21.58%	21.68%	1310
Loss or gain of revenue when the impact of Corona virus was most severe (% distribution)					
Lost by 50% or more	20.92%	14.61%	2.33%	13.24%	1261
Lost by 30 – 50%	29.92%	26.95%	26.94%	28.07%	1261
Lost by 10-30%	29.29%	37.28%	32.64%	32.83%	1261
About the same	12.55%	5.04%	24.61%	13.88%	1261
Gained by 10-30%	4.60%	5.79%	4.15%	4.84%	1261
Gained by 30-50%	1.67%	8.06%	6.22%	5.08%	1261
Gained by 50% or more	1.05%	2.27%	3.11%	2.06%	1261
Recovery from the time hit worst (% distribution of those who made a recovery)					
Recovered less than 50% of the loss	4.57%	7.42%	3.09%	5.17%	1239
Recovered 50 – 70% of the loss	11.64%	20.00%	17.13%	16.22%	1239
Recovered 70 -90% of the loss	26.26%	20.00%	16.57%	21.23%	1239
Recovered almost 100%	21.46%	11.01%	0.28%	11.62%	1239
Surpassed pre-Covid level by 10-30%	18.72%	22.70%	39.61%	26.15%	1239
Surpassed pre-Covid level by 30-50%	13.47%	14.83%	22.47%	16.55%	1239
Surpassed pre-Covid level by more than 50%	3.88%	4.04%	0.84%	3.07%	1239

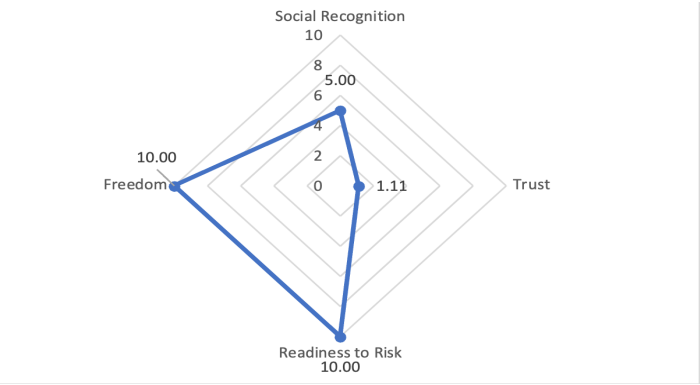
5. Informality Motivation and Resilience of Microenterprise Sector

Before we proceed to an analysis of the dynamism of microentrepreneurs and their enterprises and its relations with informality, we look at the four non-pecuniary motives collectively and construct a Composite Informal Motivation index (CIMI) for each owner-operator; CIMI measures the strength of informal motivations of that entrepreneur. We examine the distribution of microenterprises by CIMI in Kenya, Ghana and Nigeria and the three countries as a whole. Similarly, we look at the response to the negative shock, the onset of the Coronavirus pandemic, and the recovery from it together and construct an Informality Resilience Index (IRI) of a microenterprise. We assume that how much sales revenue declined from the pre-shock level, and how far it recovered from it, measure the loss of functionality due to the shock, namely, resilience.

Informality Motivations Quadrilateral and Composite Index

To visualize the strength and features of informal motivations of an owner-operator, we present the four non-pecuniary motives as a quadrilateral, each axis representing each of four non-pecuniary motivations (on a scale of 0 to 10). The degree of informal motivation of each non-pecuniary motive is plotted along each axis, as derived from the non-pecuniary motive variables outlined in Section 4, and an owner-operator's quadrilateral is obtained by connecting the four dots. See Figure 1 below.

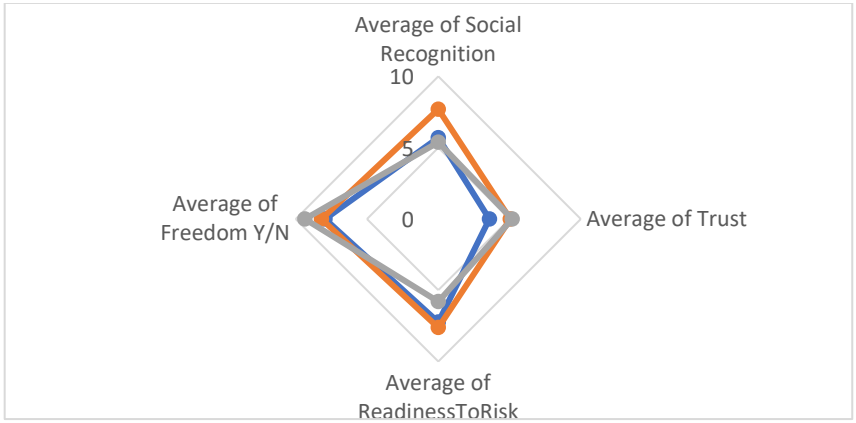
Figure 1: Informality Quadrilateral - Example



In this example, the entrepreneur, a Nigerian respondent, is strongly informal with respect to her desire to be free of institutional constraints and to be ready for disasters. However, she is not at all informal with respect to her reliance on personal trust in running business. She is motivated to be recognized in her community or religious groups for her work as a microentrepreneur but not overwhelmingly so.

Informality Quadrilaterals for Kenya, Ghana and Nigeria are shown below. In Figure 2, the Kenyan microentrepreneurs are strongly motivated to be socially recognized while relying moderately on trust and personal relationship. Their Nigerian counterparts are most strongly motivated to be free and not so keen to be prepared for adversity. In Ghana, our sample micro entrepreneurs do not reply much on trust and personal relationships and are strong on risk aversion.[11]

Figure 2. Informality Quadrilateral for Kenya, Ghana and Nigeria



The degree of four-dimensional informal motivations of an owner-operator is measured by the area under the quadrilateral. We convert this measure to an index by taking the ratio of the

[11] The high score for readiness to risks in Ghana may reflect entrepreneurs' strong desire to innovate.

area of the quadrilateral to the area of the quadrilateral that corresponds to complete informality, in which each informality motivation is fully informal (score of 10). We normalize this ratio by taking the square root, so the index ranges from 0 (zero informality) to 1 (complete informality). We call this the "Composite Informality Motivation Index" (CIMI).

The distribution of micro entrepreneurs by the strength of their informality motivation, the CIMI, is presented in Figure 3 for the three countries as a whole. Note that **the distribution is heavily skewed to stronger informality, with two thirds of the sample entrepreneurs scoring CIMI of 0.6 or above. This suggests that while a significant portion of microentrepreneurs is not very informal in terms of their motivations - almost 5 percent of our sample are hardly informal – the microenterprise sector in the three countries is highly informal in terms of the motivations of entrepreneurs.**

The distributions for Ghana, Kenya and Nigeria are summarized by the key statistics of each distribution in Table 4 below. The Kenyan microenterprise sector is more informal than Ghana's or Nigeria's with the bulk of micro entrepreneurs clustered around the higher end (0.7 – 0.8). Ghana is less informal with a mean CIMI of 0.55.

Figure 3. Distribution of Micro Entrepreneurs by Degree of Informality Motivation

Ghana, Kenya and Nigeria

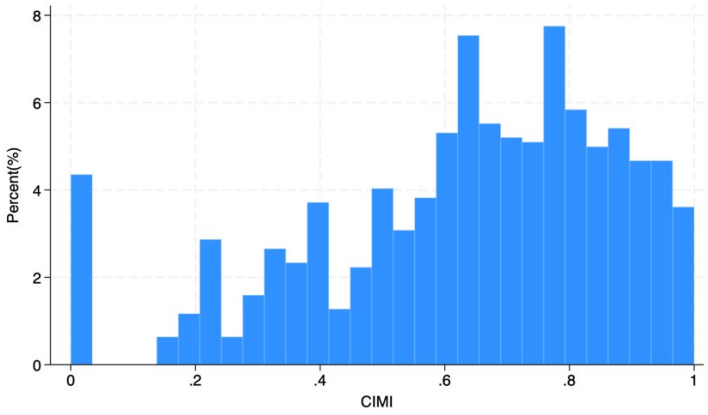


Table 4: Summary Statistics of CIMI distribution

Country	Obs	Mean	Std.dev	Median	Min	Max
KENYA	321	0.7093987	0.1942049	0.7757911	0.1924501	1
GHANA	383	0.5550045	0.269082	0.6454972	0	1
NIGERIA	215	0.6673759	0.234001	0.6454972	0	1
All	942	0.6349322	0.2452919	0.6770032	0	1

Resilience Quadrilateral and Index

A Resilience Triangle is a well-established tool to measure resilience against shocks in the field of civil engineering. “It represents a measure of both the loss of functionality of a system after a disaster and the amount of time it takes for the system to return to normal performance levels” (Bevilacqua, M. et al., 2017).

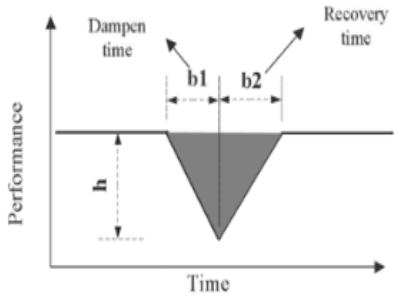


Fig. 3 Resilience Triangle with dampen time

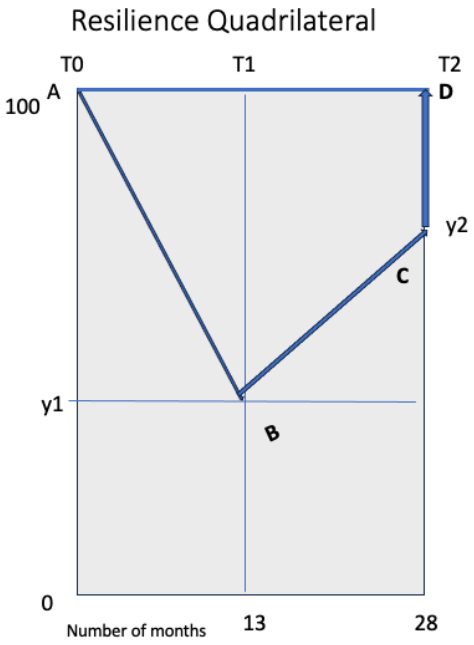
We adapt this concept to our case, using two time periods: the first is from the onset of Covid to the time when it was most severely felt (the shock period); the second, from the time when Covid was most severely felt, T1, to the time when the survey was conducted, T2 (the recovery period). We set the level of revenue prior to the onset of Covid-19 at 100 and assume that the extent of decline of revenue from 100 measures the loss of functionality as a microenterprise.

The AIE survey calculates for each enterprise the percentage of revenue lost from the pre-Covid level to the time when Covid was most severely felt, and the percentage of revenue recovered at the time when the survey was taken. Covid started in January 2021 (T0 in the chart below); it was at its worst in February 2022, measured by the number of hospitalizations globally (T1). And the survey was taken in May 2022 (T2). See the chart below. Note that many enterprises did not recover their pre-Covid revenue levels by the time the survey was undertaken. Hence, we use a quadrilateral, rather than the triangle cited in the literature.

y1 = 100 x z
where z is the rate of change in revenue during shock period, T0 to T1

Y2 = y1 x (1 + u)
where u is the rate of change in revenue during recovery period, T1 to T2

Resilience Quadrilateral, □ABCDA measures the loss of functionality from T0 to T2.



Note also that there are many enterprises which increased revenue during the shock period and a number of others whose revenue more than fully recovered to the pre-Covid level. For those enterprises, we lower z and u to reset the revenue level to 100 at T1 and T2, to be able to draw a quadrilateral This means that we underestimate the resilience of some microenterprises. (See Appendix 3 for the assumptions and computations.)

We define the Informality Resilience Index, IRI (z, u), as the ratio of the area of quadrilateral for (z, u) to the area of quadrilateral of the case of maximum loss of revenue. That is, the revenue fell by 100 during the shock period (revenue = 0 at T1) and did not recover at all during the recovery period (revenue=0 at T2).

IRI (z,u) = $-1 < -\text{IRM}(z, u)/\text{IRM}(\text{zero}) < 0$

where z is the percentage of pre-Covid revenue left at T1, and u is the percentage of revenue at T1 recovered by T2.

IRI (full) = 0,

where there was no loss of revenue, that is, z=1, and u = equal to or greater than 0

IRI (zero) = -1

where the functionality was totally lost, that is, z=0 and u=0, no resilience.

The distribution of microenterprises by the degree of resilience, as well as its key statistics, is shown in Figure 4 and Table 5. **The distribution reveals that on the whole, microenterprises are quite resilient. More than 20% of the sample of microenterprises are highly resilient, that**

is, IRI of -0.1 to 0. About one half of the micro enterprises are quite resilient, that is, IRI of -0.3 to 0. And almost none of them are highly vulnerable, that is, of IRI -1 to -0.6.

Figure 4 Distribution of microenterprises by degree of resilience, IRI.

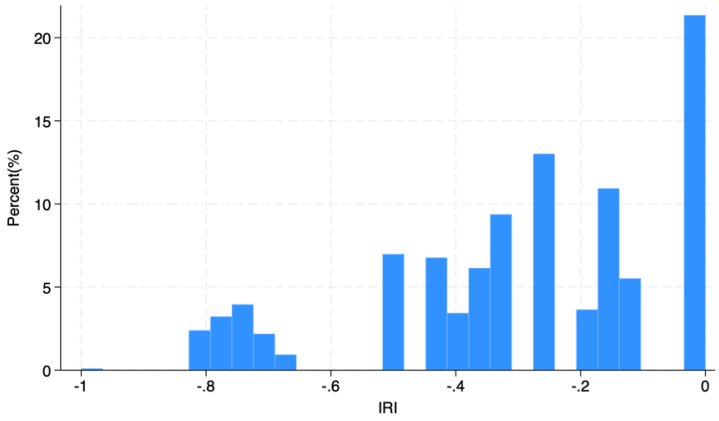


Table 5: Summary Statistics of IRI Distributions

	Percentiles	Smallest 4 Obs		
1%	-0.815407	-1		
5%	-0.7674419	-0.815407		
10%	-0.7151163	-0.815407	Obs	960
25%	-0.4418605	-0.815407	Sum of wgt.	960
50%	-0.255814		Mean	-0.2897208
		Largest 4 Obs	Std. dev.	0.2353139
75%	-0.1302326	0		
90%	0	0	Variance	0.0553726
95%	0	0	Skewness	-0.6536569
99%	0	0	Kurtosis	2.689536

6. Research Questions

We have shown in the previous sections that the low-income microenterprises are on the whole dynamic in the sense of having relatively high revenue growth and being fairly resilient to the Covid shock. Given this, a key question is whether informality is a contributing factor in the observed dynamism. In other words, the question is whether informality enhances dynamism of low-income micro entrepreneurs, and if so, through what channels?

Thus, our research questions are:

1. Do micro entrepreneurs who have strong informal motivations likely choose informal business practices? If so, which pairs of non-pecuniary motive and business practice are significantly correlated (pair-wise correlation)? It is generally assumed in the literature that

informal entrepreneurs choose informal ways of doing business. This research question asks if this conventional wisdom holds.

2. Do the informal motivations of a microentrepreneur likely raise revenue growth and/or enhance resilience of his/her business, collectively or individually? If so, is it due to the direct impact of those motives on productivity of the microenterprise or is it because the impact of informal motivations is enhanced when microentrepreneurs work in a more informal business environment? Similarly, do the informal business practices of a microenterprise raise revenue growth and/or enhance resilience, either directly or indirectly?

7. **Regression models and results**

We tested the above hypotheses with two sets of regression models. The first set incorporates the informal business practices as the dependent variables and the informal motivations as the independent variables, with a few control variables. This relates to Research Question 1. The second set has revenue growth and resilience as the dependent variables and the informal motivations, CIMI, and the four business practices as the independent variables, with a few control variables. Correlation was tested by OLS and ordinal logit regression, with country, education, use of ICT, and a few other control variables. This relates to Research Question 2.

We experimented with a number of variations in deriving dependent and independent variables for each regression model. None of them worked perfectly, as expected. However, the variable specifications described above worked reasonably well, with several significant and insightful correlations, some in line with, and a few others contrary to, our prior expectations. Our main findings are presented below.

7.1 Research Question 1: non-pecuniary motives and business practices

Our answer to this question is two-fold.

First, CIMI, that measures the strength of informal motivations collectively, is not significantly correlated to three of the four business practices, specifically, to compliance with government regulations, location of business, or extent of book-keeping. It is significantly correlated to only one of the business practices—the size of business, that is, the owner operating alone or at most with one worker. Thus, **the conventional view that informal entrepreneurs prefer to work in informal business settings does not hold as a general proposition.** See Table 6.

Table 6. The Correlation Between CIMI and Business Practice Variables

	(1)	(2)	(3)	(4)
	Location of Business	Small Firm Size	Compliance	Record Keeping
CIMI	-0.317	-0.768*	0.545	0.556
	(0.3207)	(0.3695)	(0.3355)	(0.3401)
Own Business by Yourself Y/N	0.619*	0.891***	0.270	0.152
	(0.2584)	(0.2688)	(0.2655)	(0.2647)
Latest loan amount ($100 USD)	0.0687	-0.00191	0.0550	-0.0453
	(0.0382)	(0.0432)	(0.0394)	(0.0388)
ICT				
Telephone	0.387	0.416	-0.104	-0.426
	(0.2714)	(0.2903)	(0.2775)	(0.2860)
Smartphone	-0.160	0.392	-0.260	-0.463
	(0.2534)	(0.2593)	(0.2509)	(0.2523)
Tablet	-0.494	-0.313	-0.0174	-1.365
	(0.6627)	(0.7353)	(0.7331)	(0.7058)
Education				
6-8 years	-0.436	-0.298	-0.255	-1.534***
	(0.3485)	(0.3958)	(0.3666)	(0.3770)
9-11 years	-0.0503	-0.259	-0.0336	-1.302***
	(0.3503)	(0.3999)	(0.3670)	(0.3788)
12-14 years	-0.270	-0.121	-0.139	-1.747***
	(0.3413)	(0.3859)	(0.3525)	(0.3670)
> 14 years	-0.421	0.156	-0.293	-1.376***
	(0.3778)	(0.4413)	(0.3965)	(0.4073)
Business in Service/Trade Y/N	0.215	0.658*	-1.340***	-1.199***
	(0.3242)	(0.3350)	(0.3706)	(0.3512)
Business in Manufacturing Y/N	0.663	-0.569	0.702*	0.496
	(0.3655)	(0.3548)	(0.3377)	(0.3040)
Country				
Kenya	0.257	0.874***	-0.159	0.707**
	(0.2209)	(0.2519)	(0.2272)	(0.2361)
Ghana	0.437	0.659*	0.133	2.107***
	(0.2761)	(0.3133)	(0.2847)	(0.2969)
Observations	681	707	693	662

Note: The baseline for ICT is no ICT usage, and for education, no completed primary schooling.

Second, clearly, the non-pecuniary motives and the business practices are individually inter-linked, not in all cases but in many, and also, not necessarily in a direction one may have hypothesized. Significant pair-wise correlations are summarized below. See Table 7, next page, for full regression results.

	Business location	Small Firm Size	Compliance	Record keeping	# of significant correlations
Social Recognition	--	--	Negative	--	1
Trust	Positive	Negative	Positive	Positive	4
Readiness to Risk	--	Negative	--	--	1
Freedom	--	Positive	--	Negative	2
No of significant correlations	1	3	2	2	

Much of the above correlations are intuitively understandable but some are not straightforward:

(i) Those who **value personal trust in operating business** tend to operate in a more informal location, be less compliant with government regulations, and maintain fewer records in writing (no strong incentives to keep accounts in writing). However, they tend to have a larger firm (where it might be easier to find work through personal connections?), contrary to our prior understanding.

(ii) Those who **value freedom** tend to maintain small business size (to minimize interventions from others). They also keep business records more fully (to keep their business under tighter control).

(iii) Those who **value social recognition** tend to comply more with government regulations (having more formal relations enhance social recognition?). Finally,

(iv) Those who **value to be prepared for risk** tend to have a larger business size. We hypothesized that informal entrepreneurs wanted to remain small, so as to remain flexible in case of major adversity. What this means is probably not that the hypothesis was invalid but that the readiness to risk variable needs to be reconstituted.

Micro entrepreneurs who reply on family and personal trust are more likely to choose informal business locations. This is what a number of observers noted. More surprising is that those who want to be their own boss (to be free) are apparently indifferent whether to work in a formal location like a commercial building or an informal location like a public market. Similarly, it is surprising that those who are active socially and hence would appreciate social recognition are not likely to have more detailed or open accounts.

To sum up, one half of par-wise correlations are insignificant; one quarter have **significant correlations in line with our prior suspicion; and the correlation with the remaining quarter are insignificant and are in an opposite direction. This suggests that informal motivations**

could help explain the choice of informal business practices, but it depends crucially on which pair of pecuniary motive and business practice one is trying to understand.

Table 7: Pair-wise Correlations Between Non-Pecuniary Motivations and Business Practices

Ordinal Logistic Regression	(1)	(2)	(3)	(4)
	Location of Business	Small Firm Size	Compliance	Record Keeping
SocialRecog	-0.0459	-0.0375	-0.0695**	-0.00469
	(0.0253)	(0.0285)	(0.0261)	(0.0263)
Trust	0.0818***	-0.145***	0.0817***	0.0889***
	(0.0234)	(0.0268)	(0.0246)	(0.0247)
ReadinessToRisk Y/N	-0.186	-0.803***	0.0848	-0.0297
	(0.150)	(0.1835)	(0.1560)	(0.1553)
Freedom Y/N	-0.201	0.758***	0.133	-0.537**
	(0.177)	(0.1930)	(0.1817)	(0.1829)
Business in Manufacturing Y/N	0.00228	-0.640*	-0.915***	-0.928***
	(0.240)	(0.2530)	(0.2358)	(0.2431)
Country				
Kenya	0.450**	0.686***	-0.263	0.0840
	(0.172)	(0.2008)	(0.1797)	(0.1791)
Ghana	1.233***	0.0468	0.341*	1.503***
	(0.171)	(0.1890)	(0.1711)	(0.1817)
cut1	-0.437	-1.252***	-0.237	-0.000738
	(0.271)	(0.3016)	(0.2729)	(0.2822)
cut2	0.792**		0.121	1.606***
	(0.272)		(0.2728)	(0.2872)
Observations	892	919	903	863

Note: Location of business, compliance and recordkeeping are ordered categorical variables. They are ordered from less informal to more informal. Small Firm Size=1 if number of employees <=2, and 0 if the number greater than 2.

7.2 Research Question 2a: Informality Variables and Revenue Growth

The regression results are presented in Table 8 in the next page. Table 8 shows:

First, revenue growth is positively correlated to CIMI in a model where revenue growth is regressed against CIMI but not against business practices (Model 1, Table 8). The positive correlation persists even when the business practices are added to the independent variables.

Table 8: CIMI and Revenue Growth

	(1)	(2)	(3)
	Revenue Growth	**Revenue Growth**	**Revenue Growth**
Location of Business			
Workshop in a shared area/own home		-0.0579 (0.1725)	1.055 (0.5935)
Public market unit/street/public farm		-0.0978 (0.1640)	0.655 (0.5312)
Small Firm Size Y/N		-0.133 (0.1353)	-1.340** (0.4087)
Compliance to Gov't Regulation			
Partially		-0.623* (0.2484)	-0.780 (0.8507)
Rarely/Don't at all		-0.314* (0.1436)	0.231 (0.4330)
Record Keeping			
Written record somewhat detailed or minimal		-0.187 (0.1544)	-1.716** (0.5251)
No written record		-0.0970 (0.1702)	-0.0734 (0.4926)
CIMI	0.742** (0.2574)	0.720* (0.2809)	0.533 (0.6989)
CIMI * Location of Business			
Workshop in a shared area/own home # CMII			-1.720* (0.8078)
Public market unit/street/public farm#CIMI			-1.175 (0.7485)
CIMI *Small Firm Size			1.824** (0.5746)
CIMI * Compliance			
Partially # CIMI			0.227 (1.1916)
Rarely/None/not sure # CIMI			-0.861 (0.6102)
CIMI * Record Keeping			
Written record somewhat detailed or minimal # CIMI			2.248** (0.7288)
No written record #CIMI			-0.154 (0.7012)
ICT use Y/N	-0.241 (0.1705)	-0.0168 (0.1904)	0.0866 (0.1951)
Business type			
Manufacturing	0.635** (0.2438)	0.558* (0.2555)	0.496 (0.2599)
Country			
Kenya	-1.232*** (0.1624)	-1.301** (0.1840)	-1.458*** (0.1921)
Ghana	-0.898*** (0.1595)	-0.670** (0.1792)	-0.692*** (0.1886)
Observations	900	806	806

Note: the reference group for location of business is commercial building/private farm; for compliance, fully/mostly comply; and for recordkeeping, detailed and almost all systematically/detail but not so systematically.

Second, when revenue growth is regressed on the four business practices (Model 2, Table 8), revenue growth correlates to only one of the four practices. Location of business, size of business and extent of bookkeeping are not significantly correlated to revenue growth, while it is negatively correlated to non-compliance with government regulations. This means that it is likely that growth is lower for a business whose compliance with government regulation is limited or none.

Third, in a model that incorporates the interaction terms as additional independent variables (Model 3), namely, when the interactions between CIMI and business practices are taken into account:

- The direct correlation between CIMI and revenue growth is insignificant.
- The correlation between two of the four business variables and revenue growth are strongly negative. However, the significance of one of the two, bookkeeping, is ambiguous. This is because while the category "keep somewhat detailed or minimal record" is significant, the category "keep no record" is insignificant. This means that the regression cannot distinguish those who keep no records from those who keep full records (the reference category for the compliance variable.)
- The interaction between CIMI and business size (operating alone or with at most one worker) and bookkeeping (written records somewhat detailed or minimal) is positive and significant while the interaction between CIMI and the location of business (workshop in a shared area or at own home) is significantly negative. In other words, CIMI likely lowers revenue growth where business is located in an informal location but raises it where business is operated by the owner alone or where it keeps limited records in writing.

The above findings suggest that **the positive impact of informality on revenue growth - which appears in models (1) and (2) – is derived not directly from informal motivations but through their interactions with business practices. In other words, informal motivations enhance revenue when those motivations are combined with advantages of owners working alone and maintaining limited bookkeeping.** Being an own-account business (working alone), itself tends to reduce growth. However, own-account business owners with a high CIMI tend to grow faster. In Table 7, we learned that those who value "freedom" tend to have own-account business. This suggests the possibility that valuing freedom may indirectly explain the observed revenue growth.

Interestingly, being in Kenya or Ghana is likely to reduce revenue growth relative to Nigeria. Being in manufacturing is a significant and positive factor for revenue growth, relative to trade/services/agriculture, but this correlation disappears when the interaction terms are incorporated. Sophistication in the use of ICTs is not significant in any of the models.

a. Research Question 2b: informal variables and resilience:

The regression results are presented in Table 9. They show that correlation between informality and resilience is notable if interactions between CIMI and business practice is accounted for, but it is rather weak when the interaction terms are absent. More specifically,

- In the regression model where CIMI and resilience are correlated without business practice variables (Model 1, Table 9), CIMI is not significantly correlated to the resilience variable, IRI.
- When business practices are added as explanatory variables (Model 2, Table 9), correlation with CIMI remains insignificant. Resilience, IRI, is positively correlated to business location and negatively correlated to compliance with government regulation. Correlation with business size (owner-operator plus one) or the extent of bookkeeping is insignificant. In other words, a microenterprise that is located in a more informal location is likely to have a smaller loss of revenue and/or a faster recovery while an enterprise with limited or no compliance with government regulation is likely to experience a larger loss of revenue and/or a more limited recovery.
- In a model where interactions between CIMI and business practices are incorporated (Model 3, Table 9), the direct correlation between CIMI and IRI is significant and positive. The direct correlation with business location and limited or no compliance is positive and significant while the other two business variables are insignificant. Interaction between CIMI and limited or no compliance is negative and significant but interaction with the other business variables is insignificant.

The above results suggest that the CIMI has a positive effect on resiliency, but the positive effect does not appear directly (Models (1) and (2)) because it is offset by indirect effects through non-compliance with regulation (Model (3)). Both CIMI and limited or no compliance have positive direct effects on resiliency but the interaction term of the two has a negative effect. From Table 7, we learned that greater reliance on trust in operating business tends to reduce compliance with government regulation. Thus, through its effect on compliance, trust likely enhances resilience.

Looking at this the other way around, microenterprises that rely more strongly on more formal relations in operating business are likely to be more vulnerable to natural disaster and other shocks.

Interactions between CIMI and business practices apparently play a pivotal role in determining the relation between informality and resilience. Informal motivations collectively enhance resilience. In addition, having limited compliance with government regulation and operating in an informal location also likely increases resilience.

Table 9. CIMI and Resilience Index

	(1) Resilience Index	(2) Resilience Index	(3) Resilience Index
Location of Business			
Workshop in a shared area/own home		0.0902*** (0.0249)	0.156 (0.0840)
Public market unit/street/public farm		0.0489* (0.0233)	0.161* (0.0770)
Small Firm Size Y/N		0.00271 (0.0192)	-0.0109 (0.0558)
Compliance to Gov't Regulation			
Partially		-0.0597 (0.0385)	-0.0836 (0.1160)
Rarely/Not at all		-0.0471* (0.0203)	0.194*** (0.0576)
Record Keeping			
Written record somewhat detailed or minimal		0.00800 (0.0219)	-0.0264 (0.0754)
No written record		0.0170 (0.0247)	0.00606 (0.0687)
CIMI	-0.0333 (0.0383)	-0.0344 (0.0408)	0.273** (0.1021)
CIMI * Location of Business			
Workshop in a shared area/own home # CIMI			-0.107 (0.1147)
Public market unit/street/public farm#CIMI			-0.175 (0.1068)
CIMI *Small Firm Size			0.0200 (0.0790)
CIMI * Compliance			
Partially # CIMI			0.0437 (0.1711)
Rarely/None/not sure # CIMI			-0.371*** (0.0820)
CIMI * Record Keeping			
Written record somewhat detailed or minimal # CIMI			0.0427 (0.1038)
No written record #CIMI			0.00650 (0.0977)
ICT use Y/N	0.00293 (0.0257)	-0.0117 (0.0281)	0.00469 (0.0281)
Business type			
Manufacturing	-0.126*** (0.0335)	-0.127*** (0.0355)	-0.150*** (0.0351)
Country			
Kenya	-0.0986*** (0.0239)	-0.0961*** (0.0263)	-0.111*** (0.0263)
Ghana	-0.0158 (0.0237)	-0.0248 (0.0260)	-0.0296 (0.0264)
Constant	-0.237*** (0.0371)	-0.244*** (0.0451)	-0.448*** (0.0720)
Observations	680	621	621

Note: the reference group is: commercial building/private farm for location of business; fully/mostly comply for compliance; and detailed and almost all systematically/detail but not so systematically for record keeping.

7. **Conclusion** - **Moving Forward**

The findings presented above are still provisional. Questions in the AIE survey did not exactly match the non-pecuniary motives that we intended to measure, and our data are not free of sampling bias. Nevertheless, our findings have important implications on both theories of the informal economy and policies that African governments and development agencies pursue to develop the informal economy.

First, **microentrepreneurs and the enterprises they own and operate are, as a group, dynamic.** Their sales revenue rose by 5.3% per year on average over the last five years. These enterprises are also resilient. About 70% of the enterprises in our sample are highly resilient, with the score of the Informal Resiliency Index of -0.3 to 0.0 (on a scale of -1.0 to 0.0).

Second, **low-income micro entrepreneurs in our survey are not uniform in terms of the degree of their informality**. According to the Composite Informality Motivation Index, the informality of a large majority of micro entrepreneurs is in a medium to high range but some microentrepreneurs show few signs of informality.

Third, **the nature of informality is diverse**. The Informality Motivation Quadrilateral shows that the desire to be free – to be "one's own boss" – is by far the most common motivation in becoming informal while the desire to prepare oneself for adversity is not as strong as might be thought. In terms of ways of doing business, non-compliance with government regulation is not a defining characteristic for most microentrepreneurs.

Fourth, **non-pecuniary motives of microentrepreneurs and their ways of doing business are interconnected but not necessarily in the sense that our expectations predicted.** For example, the greater the reliance on personal relationship and trust, the more likely that micro entrepreneurs operate in more informal business locations, but they are less likely to operate businesses alone or with a single apprentice.

Fifth, **the informal business practices tested in this paper, all of which are commonly used to define informality in development economics, are unlikely to raise growth of business revenue or resilience**. In fact, limited compliance with government regulation is likely to lead to smaller businesses size and slower growth of business revenue as often presumed in the literature. Similarly, an owner-operated business (small business) is linked negatively to growth of business revenue. However, owner-operated small businesses tend to raise growth of business revenue if owner's informal motivations are strong, e.g., valuing "freedom" highly.

Finally, **informal motivations are collectively linked positively to the dynamism of microenterprises, either directly or through interaction with certain informal business practices**. Informal motivations enhance revenue growth when those motivations are combined with advantages gained by owners working alone and maintaining limited bookkeeping. Informal motivations directly strengthen resilience although the positive effect

appears to be offset by negative impact of its interaction with limited compliance with government regulations.

Thus, **a pervasive view that informality leads to low productivity and little growth needs to be qualified.** The smallness of microenterprises may be by choice and not necessarily a consequence of underdevelopment**.**

Going Forward, it is imperative to perform a refined and improved iteration of conceptualizing informality. It is equally important to improve the database so that non-pecuniary motives can be better represented. Moreover, informality in doing business should be carefully defined and underpinned by theoretical understanding. Particular attention should be paid to the synergy between informal motivations and informal ways of doing business, which, we have amply shown, plays a pivotal role in determining the relation between informality and dynamism.

While there is apparent merit in the hypotheses advanced by anthropologists, quantitative work at scale is needed if those hypotheses are to be generalized. Therefore, a promising avenue for advancing this research lies in a more comprehensive interdisciplinary approach.**, combining large-scale surveys backed by ethnography, multi-year monitoring by professional anthropologists, and advanced quantitative methods for analysis**. Such multifaceted strategy will unveil further nuanced dimensions of the informal economy, not only enriching our understanding but also **contributing to more informed policy.**

References:

Aditya, B. and Amri, I. (2023) Rethinking informal economy resilience during crisis: Experience from COVID-19 pandemic. *The Indian Journal of Labour Economics* 2023 66:711–737 https://doi.org/10.1007/s41027-023-00458-1

Amin, M. and Islam, A (2015) "Are Large Firms More Productive than Small Informal Firms? Evidence from Firm-level Surveys in Africa. World Development, Vol 74, Oct 2015, p 374-38\

Amaral, P. S. and Quintin, E. (2006). A competitive model of the informal sector. Journal of monetary Economics, 53(7), 1541-1553. https://doi.org/10.1016/j.jmoneco.2005.07.016

Bevilacqua, M., F. E. Ciarapica, G. Marcucci (2017) "Supply Chain Resilience Triangle: The Study and Development of a Framework" World Academy of Science, Engineering and Technology International Journal of Economics and Management Engineering Vol:11, No:8, p. 1995

Benjamin, Nancy and Ahmadou Mbaye (2012) *The Informal Sector in Francophone Africa: Firm Size, Productivity, Institutions*. International Bank for Reconstruction and Development & The World Bank. https://openknowledge.worldbank.org/handle/10986/9364 (accessed November 1, 2020).

Blunch, Niels-Hugo, Sudarshan Canagarajah and Dhushyanth Raju. (2001) The Informal Sector Revisited: A Synthesis Across Space and Time. World Bank Social Protection Discussion Paper No. 0119. https://documents.worldbank.org/en/publication/documents-reports/documentdetail/496711468766544695/the-informal-sector-revisited-a-synthesis-across-space-and-time

Brouwer, lily, Iftekhar (2024), "The ASA-I – Duke Survey of Informal Enterprises in Ghana, Kenya and Nigeria" forthcoming

Elgin, C., Kose, M., Ohnsorge, F. and Yu, S. (2021) "Understanding informality," CAMA Working Papers 2021-76, Centre for Applied Macroeconomic Analysis, Crawford School of Public Policy, The Australian National University.

Charmes, J. (2016) The informal economy: Definitions, size, contribution and main characteristics. in Kraemer-Mbula, E. and Wunsch-Vincent, S. eds. *The Informal Economy in Developing Nations: Hidden Engine of Innovation?* Cambridge, Cambridge University Press.

Chen, Martha Alter (2012) The Informal Economy: Definitions, Theories and Policies. Women in Informal Employment: Globalizing and Organizing (WIEGO) Working Papers No. 1

David, A., Diallo, Y., and Nilsson, Y. (2023) Informality and Inequality: The African Case, *Journal of African Economies* 32(2), ii273–ii295.

Devine, H. (2021) How institutions shape the informal economy, in C.C. Deléchat and L. Medina eds. *The Global Informal Workforce: Priorities for Inclusive Growth*, International Monetary Fund, Washington, D.C. 223-252.

Fayomi, O. O., Adebayo, G. and Okorie, U. (2018) "The resilient informal economy in the milieu of African development." in S.O. Oloruntoba, T. Falola (eds.), *The Palgrave Handbook of African Politics, Governance and Development*. Palgrave Macmillan New York: 661-676.

Fourie, F. (2018). Informal-sector employment in South Africa: An enterprise analysis using the SESE survey. *The South African Informal Sector: Creating jobs, reducing poverty*, 103-150.

Hart, K. (1973). Informal Income Opportunities and Urban Employment in Ghana. *The Journal of Modern African Studies*, *11*(1), 61–89. https://doi.org/10.1017/S0022278X00008089

ILO (2013) *Measuring Informality: A Statistical Manual on the Informal Sector and Informal Employment*, Geneva, International Labour Organization.

La Porta, R and A. Schleifer (2014), "Informality and Development", Journal of Economic Perspectives, Vol. 28, No. 3, Summer 2014 (pp. 109 -26)

Losby, J.L, et al (2002), Informal Economy Literature Review, ISED and the Aspen Institute

Maloney, William F.(2004) "Informality Revisited," World Development, Elsevier, vol. 32(7), pages 1159-1178, July.

Meagher, Kate, and Ilda Lindell, eds. (2013). "Introduction. ASR Forum: Engaging with African Informal Economies: Social Inclusion or Adverse Incorporation? " *African Studies Review* 56 (3): 57-76.

Meagher, K. (2010) *Identity Economics – Social Networks & The Informal Economy in Nigeria*. Rochester, NY. James Currey.

Medina, L., Jonelis, A, and Cangul.M (2017).The Informal Economy in Sub-Saharan Africa: Size and Determinants. IMF Working Paper. https://www.imf.org/en/Publications/WP/Issues/2017/07/10/The-Informal-Economy-in-Sub-Saharan-Africa-Size-and-Determinants-45017.

Ochiai T, Hirano-Nomoto, M and Agbiboa DE (eds.) (2021) *People, predicaments and potentials in Africa*. Langaa Research and Publishing Common Initiative Group (Bamenda, Cameroon)

OECD/International Labour Organization (2019), "Definitions of informal economy, informal sector and informal employment", in *Tackling Vulnerability in the Informal Economy*, OECD Publishing, Paris.

Ogawa, Sayaka (2016) *Toshi wo ikinuku tame no kochi – Tanzania no reisai shounin no minzokushi (Shrewd for survival in urban centers: ethnography of Machinga, precarious merchants in Tanzania)* Sekai Shisou Sha

Ohnsorge, F. and Yu, S. (2022) *The Long Shadow of Informality: Challenges and Policies*, The World Bank, Washington, D.C. https://thedocs.worldbank.org/en/doc/37511318c092e6fd4ca3c60f0af0bea3-0350012021/related/Informal-economy-full-report.pdf

Shahid, M.S., Williams, C.C., and Martinez-Perez, A. (2020) **"**Beyond the formal/informal enterprise dualism: explaining the level of (in)formality of entrepreneurs" *The International Journal of Entrepreneurship and Innovation* 21(3): 191-205.

World Bank (2016) Informal Enterprises in Kenya. Washington D.C.: The World Bank. https://openknowledge.worldbank.org/handle/10986/24973

World Bank (2013), *World Development Report 2013*, https://documents1.worldbank.org/curated/en/263351468330025810/pdf/73068-v1-english-revised-PUBLIC-PUBDATE-10-15-12.pdf

World Bank (2022), The Informal Sector Enterprise Survey, https://www.enterprisesurveys.org/en/informal-businesses

Appendix I Formal vs Informal: Comparison of Business Outcomes

	Informality Definition Criteria:			
	Compliance with Gov't Regulation		Tax Payment	
Outcome indicator	**Formal Enterprise**	**Informal Enterprises**	**Formal Enterprises**	**Informal Enterprises**
Monthly revenue (US Dollar)	545.63	450.84	518.52	350.39
Labor productivity	258.42	298.05	286.43	263.89
No. of workers	2.7	2.0	2.5	1.7
Revenue Growth	0.06	0.04	0.07	0.04

Notes:

(1) Monthly revenue in US dollar converted from local currency; labor productivity equals monthly revenue divided by number of workers; revenue growth was originally reported in percent, for example, -0.3 = decreased >30 %, -0.2= decreased 10-30%, 0 = about the same, 0.2 = grown 10-30%, 0.3 = grown >30%.

(2) Formal enterprises are microenterprises that fully, mostly, or partially comply with government regulation. Informal enterprises are microenterprises that rarely or not at all & don't know comply regulation.

(3) Formal enterprises are microenterprises that fully, mostly, or partially comply with government regulation. Informal enterprises rarely or not at all & don't know comply regulation.

Appendix II Sensitivity of business outcomes of microenterprises to definition of informality

	Informality Definition Criteria:							
	Microenterprise groups by bookkeeping categories				Microenterprise groups by tax payments categories			
Outcome Indicators	**5**	**5&4**	**5&4&3**	**5&4&3&2**	**5**	**5&4**	**5&4&3**	**5&4&3&2**
Monthly revenue (US Dollar)	333.80	380.41	410.03	478.43	355.76	350.39	455.10	448.65
Labor productivity	215.23	253.97	258.37	271.96	268.18	263.89	243.14	253.34
No. of workers	2.1	2.1	2.2	2.3	1.7	1.7	2.4	2.5
Revenue Growth	0.06	0.06	0.06	0.05	0.04	0.04	0.04	0.07

Notes:

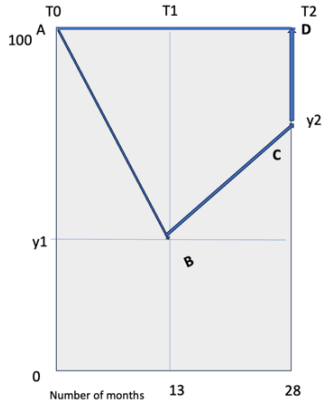
(1) Categories for bookkeeping: 5 - no written record; 4 – minimal; 3 - keep some record; 2 - detailed record but not systematic; and 1 – keep detailed record systematically.

(2) Categories for tax payment: 5 – never; 4 – rarely; 3 – sometimes; 2 – usually; and 1 - always.

Appendix III Construction of the Informal Resilience Index (IRI)[12]

According to the original formulation, Resilience Triangle represents "the amount of time it takes for the system to return to normal performance levels." (Bevilacqua M. et al, 2017). We measure the loss of functionality due to the shock by the decline in revenue from the pre-Covid levels, following the original formulation. However, in or case, in many cases, the level of revenue did not reach the pre Covid level when the Survey was taken. In those cases, we obtain a quadrilateral, rather than a triangle as shown below.

Figure 3.1 Resilience Quadrilateral

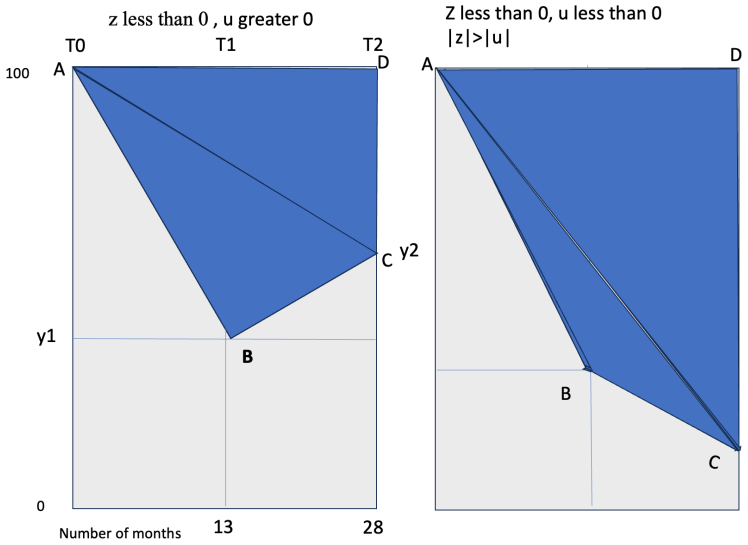


In Figure 3.1, the performance level at T1, y1, equals 100*z, where z is the rate of change in revenue during shock period, T0 to T1. The performance level at T2, y2, equals y1*(1+u), where u is the rate of change in revenue during recovery period, T1 to T2. The area surrounded by points ABCDA measures the loss of functionality from T0 to T2. We call this "the Informality Resilience Measure (IRM)".

In a typical case, revenue would fall during the shock period, i.e., z is negative, and it would rise during the recovery period, i.e., u is positive. IRM in this case is depicted in the left panel of Figure 3.2. There are also cases where revenue keeps falling during the recovery period, i.e., u is negative. IRM in those cases are depicted in the right panel of Figure 3.2

[12] Prepared by Jiahan Yin

Figure 3.2 Informality Resilience Measure (IRM)



We derive the rate of change in revenue during the shock period, z, from the following question in the Survey: "How much revenue did you lose or gain as a result of the coronavirus pandemic? Please compare your revenue before the outbreak of coronavirus and your revenue when the impact was most severely felt." Respondents were asked to select an answer from: lost all revenue; lost 50-90%; lost 30-50%; lost 10-30%; about the same; gained by 10- 30%; gained by 30-50%; gained by 50-100%; gained by more than 100%. For simplification, we group respondents who gained revenue during the shock period (i.e., z greater than zero) together with those whose revenue was about the same (i.e., z equals zero). In other words, for the purpose of calculating the degree of resilience, we assume that no microenterprise increased revenue during the shock period. Then, we take a midpoint of the range in each answer to derive z:

z= -1.00 (i.e., 100%) for lost all revenue;

z = - 0.75 (i.e., 75%) for lost 50-90%;

z = - 0.4 (40%) for lost 30-50%;

z = -0.2 (20%) for lost 10-30%;

z = 0 (0%) for about the same; gained by 10-30%; gained by 30-50%; gained by 50-100%; gained by more than 100%.

We derive the rate of change of revenue during the recovery period, u, from the following Survey question: "How well has your business recovered from the coronavirus? Please compare your revenue at the time when the impact of coronavirus was felt most severely to your revenue now. How much revenue did you lose or gain over this period?" Respondents were asked to select an answer from: lost all revenue; lost 50-90%; lost 30-50%; lost 10-30%; about the same; gained by 10-30%; gained by 30-50%; gained by 50-100%; gained by more than 100%. Taking mid-points, u are approximated by:

u = -1 (100%) for lost all revenue;

u = -0.75 (75%) for lost 50-90%;

u = -0.4 (40%) for lost 30-50%;

u = -0.2 (20%) for lost 10-30%;

u = 0 (0%) for about the same;

u = 0.2 (20%) for gained by 10-30%;

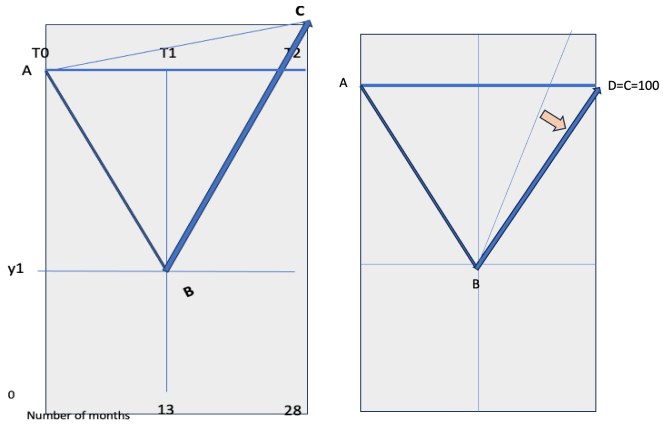
u = 0.4 (40%) for gained by 30-50%;

u= 0.75 (75%) for gained by 50-100%;

u= 1.00 (100%) for gained by more than 100%.

Note that the performance level at T2 could exceed 100 if u is very large, specifically if u > 1/(1+z)-1. This case is illustrated in the left panel of Figure 3.3. In this case, the loss of functionality cannot be calculated as the distance between the pre-Covid performance level and the performance level during T0 and T2. Thus, to measure the loss of functionality, we reset u to 1/(1+z)-1, as shown in the right panel of Figure 3.3. In this case, IRM is measured by area ΔABC.

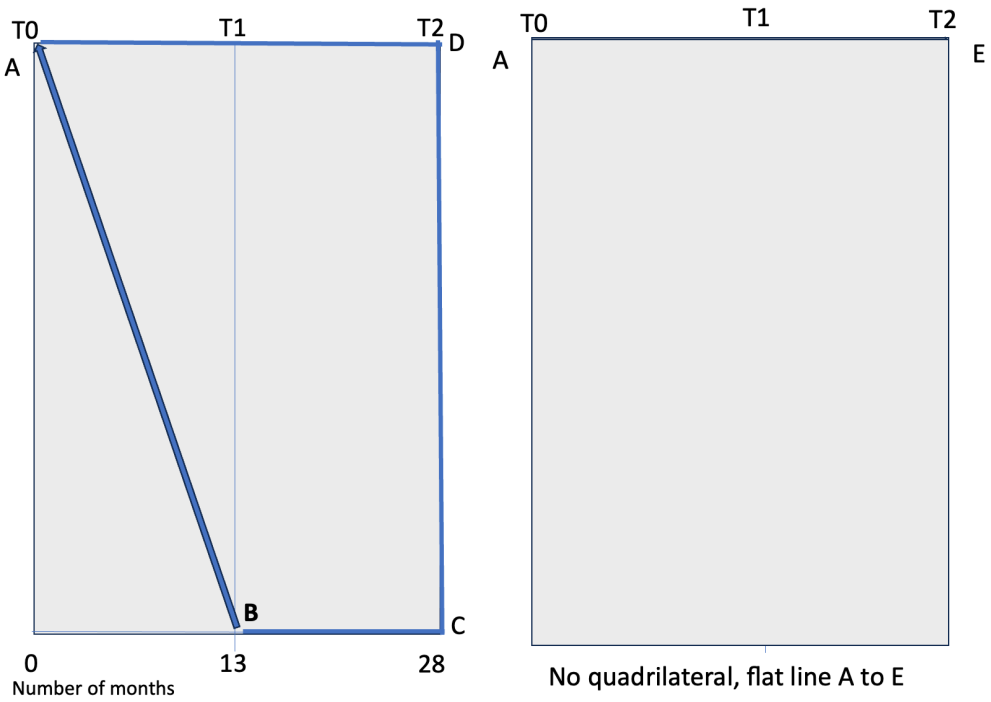
Figure 3.3 Adjustments in the rate of recovery, u



Now, we convert IRM to an index, Informal Resilience Index, IRI. We set IRI of a microenterprise to 0 if the microenterprise is completely resilient, i.e., no revenue was lost during the shock period and also the recovery perio. This case is shown in the right panel of Figure 3.4 below. We set IRI to -1 if the enterprise has no resliency, i.e., the pre-Covid revenue was totally lost during the shock period and revenue did not recover at all during the recovery period. This case is depicted in the left panel of Figure 3.4.

We derive IRI for a combination of z and u, IRI(z,u), by deviding IRM (z,u) by IRM (zero), i.e., the case of maximum loss of functionality, i.e., revenue totally lost during the shcok period and did not at all recover during the recovery period, IRM (zero) = IRM(-1, 0). See Figure 3.4.

Figure 3.4 Cases of zero resilience and full resilience



In Figure 3.4,

IRM(zero) = ABCDA (-1, 0) =(15+28)*100*0.5=2150

IRM (full) = IRM (0,0) = 0

Then, the Informality Resilience Index, IRI, is derived as follows:

IRI (zero) = - IRM (zero)/IRM (zero) = -1

IRI (z, u) = IRM (z, u)/IRM (zero),

for z>0 and u>0, and z<0 and u <0 and |z|>|u|,

IRI (full) = IRM (full)/IRM (zero) = 0/IRM (zero) = 0.