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## **Dynamics of off-farm self-employment in the West African Sahel**

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**Abstract:** This study uses detailed household-level data to analyse off-farm self-employment dynamics in Mali and Niger. It adds to the literature that acknowledges the existence of heterogeneities in informal work and the body of evidence on informal self-employment in fragile and conflict-affected countries. It finds that self-employed workers are more represented in the lower-tier informal work status, with a particularly high percentage in Niger and among female, rural, youth, and old adult workers in both countries. The study also finds that monthly average earnings from self-employment are lowest among lower-tier informal workers, who also have a low probability of transitioning out of this status. However, household-related factors such as asset and livestock holdings and non-labour income may play an important role in helping these vulnerable groups of workers move up the self-employment ladder, especially in the event of shocks.

**Key words:** fragile and conflict-affected countries, informality, self-employment dynamics, West African Sahel

**JEL classification:** H32, J46, J62, O12

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## 1 Introduction

In most developing countries, wage jobs are elusive (Fox et al. 2016). Studies show that less than 5 per cent of working-age individuals in Sub-Saharan Africa (SSA) have a formal public wage job (Banerjee and Duflo 2007). The vast majority of individuals, especially those living in rural areas, derive their livelihood from agriculture. However, the agricultural sector coexists with a vibrant non-farm sector. Thus, the majority of African workers in both urban and rural areas are involved in some kind of non-farm self-employment. These workers choose non-farm entrepreneurship through the creation and the management of small businesses as a strategy to boost their income and enable them to mitigate unexpected shocks<sup>1</sup> to their livelihood because of the high-risk nature of the agricultural sector and limited options in the formal employment sectors (Nagler and Naudé 2017). Thus, the non-farm economy has been shown to have the potential to spur economic growth and poverty reduction (Fox and Sohnesen 2012). Yet in most African countries it is characterized by a high level of informality, with a large proportion of self-employed workers (Gollin 2008; ILO 2018; Porta and Shleifer 2014).

Self-employed work consists mainly in small business activities, mostly involving workers with low skills and little opportunity to find decent salaried employment. Most non-farm businesses are small, and in many cases they are owned by a single individual who is both the investor and the manager (McCaig and Pavcnik 2015). These non-farm self-employed workers are heterogeneous in many dimensions, including the sectors of activity in which they operate, the structure of the business activity, the growth potential of the business, and their likelihood of becoming formal workers (Bruhn and McKenzie 2014). The most vulnerable of these businesses are found in rural areas and face numerous constraints to expansion and growth (Bekele and Worku 2008).

Another feature of non-farm self-employed workers in African and other developing countries is that they are generally engaged in unregistered business activities and are unclear whether moving to formality would improve their performance (Campos et al. 2018; McKenzie and Sakho 2010). Although the importance of entrepreneurship for poverty reduction is acknowledged (Benjamin and Mbaye 2012; McCaig and Pavcnik 2015; Mhando and Kiggundu 2018), there is a concern that self-employment in Africa is generally survivalist or necessity-driven (Williams and Youssef 2014). How to bring self-employed workers out of informality is thus a continuing concern of policy-makers, development practitioners, and researchers alike. The recent Covid-19 pandemic has renewed the question of informal work in SSA, as the pandemic is deemed likely to be more detrimental to informal workers (Balde et al. 2020; Danquah et al. 2020).

While several studies have clearly documented the importance of non-farm self-employment, advances still need to be made in the literature related to the understanding of its heterogeneity and dynamics (McCaig and Pavcnik 2015). We add to the literature that acknowledges the existence of heterogeneities in informal work and accounts for the division of informal employment work into upper-tier and lower-tier in Central America and anglophone Africa (Alaniz et al. 2020; Danquah et al. 2019). In this paper, we analyse the dynamics of non-farm self-employment in two West Africa Sahel countries—Mali and Niger. We differentiate non-farm self-employed workers according to three distinct work statuses: formal self-employed workers, lower-tier informal self-employed workers, and upper-tier informal self-employed workers. We examine the profile of

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<sup>1</sup> Defined as events that cause an unexpected loss of revenue from non-agricultural and salaried activity, negatively affecting the household's financial capital potential.

these workers and take advantage of the panel nature of Niger data to extend our analysis to mobility between work statuses and the factors explaining the transition to a higher work status.

Our three-fold distinction in formality status is justified by the mixed literature showing that the transition from low-return to high-return non-farm employment is welfare improving (Bezu and Barrett 2012), that inducing more self-employment into formality will not necessarily lead to positive changes in workers' performance (McCaig and Nanowski 2019; McKenzie and Sakho 2010), and that most of the non-farm self-employed workers in developing countries are reported to be informal (Nagler and Naudé 2017) yet have a potential for growing their business activities (Fox and Sohnesen 2012). An understanding of the heterogeneities governing non-farm self-employment could thus inform effective specific policy interventions towards the informal sector.

Given widespread evidence of a gender gap in non-farm entrepreneurship (Jayachandran 2020), we also conduct the analyses through a gendered lens, asking whether there are systemic differences between female workers and male workers.

Finally, the literature is skewed towards specific regions and countries, creating a risk of distorting understanding of the functioning of non-farm self-employment across many settings. Our focus on the West African Sahel—a region that has received little attention in the literature so far—adds to the body of evidence on informal self-employment. We complement the literature on Latin America, South Asia, and Eastern and Southern Africa by studying two West African countries, Niger and Mali, which are among the poorest in the world and face important development challenges, thus also adding to understanding of the dynamics of self-employment in fragile and conflict-affected countries. Specifically, our study adds to the work of Grimm et al. (2012) on the informal sector in seven capital cities in francophone West Africa, including Niger and Mali, which shows the existence of self-employed workers with the potential to become formal entrepreneurs, as they share the same business characteristics as these. We leverage the recent availability of rich nationally representative data for these two countries—Mali and Niger—to analyse work statuses in both urban and rural locations. Besides examining the factors related to the characteristics of self-employed workers and their business activity that might explain the transition between work statuses, we also seek to establish how such a transition responds to the occurrence of shocks.

The remainder of the paper is structured as follows. In Section 2, we provide a brief overview of the broader literature into which this study fits. We then describe the datasets and their main features in Section 3. In Section 4, we present some descriptive results on work status, the profile of self-employed workers, and the characteristics of their business activities in the two countries of study. Section 5 focuses on the analysis of employment dynamics. We then offer concluding remarks in Section 6.

## **2 Related literature**

Our study, focusing on the West African Sahel, sits at the intersection of two large and growing strands of the literature. The first deals with informal microenterprises in developing countries (Bennett 2010; McCaig and Pavcnik 2015). A recent review by Jayachandran (2020), extending previous reviews, has documented several areas this literature has explored, including the role of access to capital and business training, the importance of barriers to hiring and formalization, and gender differences in the profile and performance of firms. It is widely believed that individuals in developing countries face steep challenges in starting businesses, which are therefore constrained to remain informal, with few prospects for growth. Many of these individuals are self-employed by necessity rather than self-employed as a calling (Jayachandran 2020). Our study is directly related

to this literature in that we characterize both the profile of self-employed workers and the enterprises they work in, including the gender dimension.

The second strand of the literature our study ties into concerns the factors explaining the dynamics of off-farm employment in low- and middle-income countries. Nagler and Naudé (2017) and more recently Van den Broeck and Kilic (2019) explore this question using the World Bank's Living Standards Measurement Study – Integrated Surveys on Agriculture (LSMS-ISA) data for Ethiopia, Malawi, Nigeria, Tanzania, and Uganda.<sup>2</sup> They find that the drivers of entering off-farm employment and staying in it are country- and gender-specific, and include vulnerability to shocks. Our study also uses the World Bank's LSMS-ISA, but it considers an extra dimension of off-farm employment dynamics other than entry into or exit from off-farm employment.

Our study categorizes workers into informal self-employment statuses and studies their transition between statuses with a focus on the drivers of growth from lower-tier informal self-employment to either upper-tier informal or formal self-employment. Our approach is related to Grimm et al. (2012), which studied non-farm employment in seven capital cities in francophone West Africa and showed that a substantial share of self-employed workers are 'survivalists', whose business skills and entrepreneurial behaviour resemble those of formal entrepreneurs.

It also aligns with recent studies in Central America and SSA (Alaniz et al. 2020; Danquah et al. 2019) that have examined employment movement within and between formal and informal work statuses. Using data from Ghana, South Africa, Tanzania, and Uganda, Danquah et al. (2019) found significant heterogeneity among lower-tier and upper-tier informal self-employed workers, the latter finding it difficult to make the transition to formal employment. This is contrary to the situation in Costa Rica and Nicaragua, where self-employed workers have not been found stuck in lower-tier informal work (Alaniz et al. 2020), showing the necessity to study informal work dynamics in different contexts. The study of Danquah et al. (2019) focused on SSA but was limited to anglophone Africa. Benjamin and Mbaye (2012) and Grimm et al. (2012) analysed the informal sector in francophone West Africa and made a distinction between large and small informal firms. However, the authors focused only on the urban informal sector in some capital cities. Our study, in contrast, uses nationally representative recent data covering both urban and rural workers over multiple periods, allowing us to study employment dynamics in a region, the West African Sahel, that has hitherto received little attention in the literature.

### **3 Data sources, samples, and unit of analysis**

We primarily use data from the LSMS-ISA in Mali and Niger. We use data from two survey rounds for Mali (2014 and 2017) and two survey rounds for Niger (2011 and 2014). The data for Mali are repeated cross-sectional data, with different households interviewed in the two rounds. The data for Niger are panel data, with the same households interviewed in both rounds. Both surveys collected rich household-level, individual-level, firm-level, and community-level information, and the samples for each country are nationally representative.

In this study, we focus on the samples of off-farm self-employed workers, which are the unit of analysis. Off-farm self-employed workers are individual household members involved, during the 12 months prior to the surveys, in a self-employment/entrepreneurship (non-agricultural) activity,

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<sup>2</sup> The data were collected by the National Bureau of Statistics in collaboration with the World Bank and can be downloaded from <https://microdata.worldbank.org/index.php/catalog/lsms>.

either as own-account workers or as owners (employers). The samples we use for Mali consist of 2675 workers in 2014 and 952 workers in 2017. The samples used for Niger consist of 3727 workers in 2011 and 2885 workers in 2014. For the purpose of the analysis of the employment dynamics, we additionally construct, with the Niger database, a balanced panel of 1465 off-farm self-employed workers in 2011 and 2014, based on the same identifiers of households and household members tracked in these two years of surveys.

The structure of the samples has the advantage of allowing a comparison of statistics over location and time. We can determine whether the data present the same picture within the same context for the same subjects in different years (the Niger case in both survey rounds), within different contexts for different subjects in the same year (Niger and Mali cases for the 2014 survey round), and within the same context for different subjects in different years (Mali case in the two survey rounds).

## **4 Off-farm self-employment work and earnings in Mali and Niger**

### **4.1 Business activities and formality status of self-employed workers**

Table 1 presents the characteristics of the activities self-employed workers were involved in during the 12 months prior to the surveys. Statistics are presented for the total samples of each survey round, for sub-samples in urban and rural areas, and for sub-samples of self-employed women and men, with significant differences between the last two groups tested using bivariate regressions with sampling weights.

Table 1 shows that self-employment work in Niger and Mali is, overall, predominantly own account-based work. Yet some differences exist between the two countries. Only a tiny proportion of self-employed workers in Niger share their proprietorship with a non-household member (at most 2 per cent), whereas in Mali the percentage of self-employed workers that co-own their business activities with external household members amounted in 2014 to 11 per cent and in 2017 to 22 per cent in rural zones and 21 per cent among self-employed men. We note that in both Niger and Mali, self-employed workers generally persist in their activities for a long period, as the average age of their businesses is 10 years. Women entered self-employment later than men in both countries and years.

Another key characteristic of self-employed workers in these two countries is the location of their business activities. Close to half of the self-employed workers in the samples operate at a fixed location, either in the household's dwelling or in an outside building. Slightly more than a third of them are mobile, with no fixed location. There is substantial heterogeneity across gender and place of residence within each country. A high share of self-employed women operate in a fixed location with a more pronounced picture in Niger (64–71 per cent) than in Mali (46–51 per cent). This confirms the notion that self-employed women in developing countries tend to operate in the household dwelling to reduce costs and to more easily combine family life with business activity (Amin 2010; Babbitt et al. 2015). As a consequence, they are likely to sort into low-return home-based economic activities (Berge and Pires 2015; Bruhn 2009).

Table 1: Characteristics of self-employment work and formality status

	First survey round					Second survey round						
	All	Rural	Urban	Women	Men	All	Rural	Urban	Women	Men		
<b>Niger</b>	<b>2011 (N = 3727)</b>					<b>2014 (N = 2885)</b>						
Co-owns the business	0.01	0.01	0.02	0.01	0.02	*	0.02	0.02	0.02	0.01	0.02	***
Age of business (years)	9.74	10.38	8.77	8.66	10.70	***	10.32	10.42	10.20	8.79	11.55	***
Location: Fixed dwelling	0.44	0.49	0.38	0.71	0.21	***	0.39	0.41	0.36	0.64	0.19	***
Location: Fixed outside	0.25	0.18	0.35	0.14	0.35	***	0.25	0.18	0.34	0.15	0.34	***
Location: Mobile	0.30	0.33	0.27	0.15	0.44	***	0.36	0.41	0.29	0.21	0.48	***
Salaried workers (#)	0.14	0.04	0.27	0.08	0.19	***	0.17	0.05	0.31	0.06	0.26	***
Has registered workers	0.00	0.00	0.01	0.00	0.00		0.01	0.00	0.02	0.01	0.01	
Has no salaried worker	0.96	0.97	0.93	0.98	0.94	***	0.94	0.97	0.89	0.97	0.91	***
Registered	0.05	0.02	0.10	0.04	0.06		0.02	0.00	0.05	0.00	0.04	***
Formal	0.04	0.02	0.08	0.03	0.05		0.02	0.00	0.03	0.00	0.03	***
Upper-tier informal	0.25	0.20	0.34	0.16	0.34	***	0.27	0.20	0.36	0.17	0.36	***
Lower-tier informal	0.70	0.79	0.58	0.81	0.61	***	0.71	0.80	0.60	0.83	0.61	***
<b>Mali</b>	<b>2014 (N = 2675)</b>					<b>2017 (N = 952)</b>						
Co-owns the business	0.10	0.11	0.10	0.08	0.11	*	0.18	0.22	0.16	0.14	0.21	***
Age of business (years)	9.83	10.00	9.65	8.95	10.50	***	10.12	8.67	10.69	8.57	11.27	***
Location: Fixed dwelling	0.33	0.41	0.24	0.46	0.22	***	0.38	0.59	0.28	0.51	0.28	***
Location: Fixed outside	0.29	0.18	0.40	0.21	0.35	***	0.38	0.24	0.45	0.24	0.49	***
Location: Mobile	0.39	0.41	0.36	0.33	0.43	***	0.24	0.18	0.27	0.25	0.23	
Salaried workers (#)	0.31	0.26	0.35	0.18	0.40	***	0.68	0.87	0.59	0.40	0.90	***
Has registered workers	0.01	0.01	0.02	0.01	0.02	*	na	na	na	na	na	
Has no salaried worker	0.90	0.91	0.88	0.94	0.86	***	0.76	0.75	0.77	0.84	0.70	***
Registered	0.07	0.04	0.09	0.04	0.09	***	na	na	na	na	na	
Formal	0.05	0.03	0.07	0.03	0.07	***	na	na	na	na	na	
Upper-tier informal	0.29	0.22	0.37	0.23	0.34	***	0.51	0.42	0.55	0.34	0.63	***
Lower-tier informal	0.65	0.75	0.56	0.74	0.59	***	0.49	0.58	0.45	0.66	0.37	***

Note: 'na' means 'not available' due to missing data on the related variables. Significant differences across gender are tested using bivariate regressions with sampling weights. Significant levels are indicated by \*\*\* p<0.01, \*\* p<0.05, \* p<0.10.

Source: authors' calculations based on LSMS-ISA data for Mali and Niger.

We should note that hiring external workers is marginal in the study context. Self-employed workers essentially employ family labour to assist them. Only a handful of self-employed workers—mostly women and in rural areas—hired salaried workers (generally ranging from two to four), only a small share of them being formally registered in the national social security fund (henceforth NSSF).<sup>3</sup> Few self-employed workers followed the standard business practice of keeping an accounting system or a commercial register to record all transactions, and very few enterprises had a fiscal identification number (what we define as 'registered'); most of those that did were managed by men and located in urban areas. These statistics show the informal character of most self-employment in these countries, as in developing countries in general (Jayachandran 2020; La Porta and Shleifer 2014).

Based on the figures shown in Table 1, we classified self-employed workers in three work statuses (Table A1 in the Appendix), differentiating between formal self-employed, upper-tier informal self-employed and lower-tier informal self-employed, in accordance with the International Labour

<sup>3</sup> Niger's fund is called the Caisse Nationale de Sécurité Sociale and Mali's the Caisse Malienne de Sécurité Sociale.

Organization's definition of informal employment (ILO 2018). The formal self-employed are defined as own-account workers (with no salaried workers) who (a) have kept written accounts, (b) have a commercial register, or (c) have a fiscal identification number. They also include business owners and employers (those with at least one employee) who have observed at least one of these three regulations and registered their employees in the NSSF. Upper-tier informal self-employed workers are identified as those who do not comply with the above regulations but whose operations are in fixed premises outside the dwelling. Lower-tier informal self-employed workers are identified as those who do not comply with the above regulations but whose operations are in their dwelling or who are itinerant/mobile. Note that self-employed workers are divided into informal work statuses only for the second survey round in Mali, due to missing data on variables related to registration.

The share of self-employed workers found in each work status is presented at the bottom of Table 1 for each country. The majority of self-employed workers are in the lower-tier informal work status in both countries, with a higher percentage found in Niger. In both countries, self-employed women and self-employed workers in rural areas are mostly found in the lower-tier informal work status, contrary to their male counterparts and workers in urban areas, who are found mostly in the formal and upper-tier informal work statuses.

In Table 2 we report summary statistics on the profile of the self-employed workers and the main branch of activity they were operating in, according to their work status. We also present results of a test for differences between means of the variables between lower-tier informal and upper-tier informal self-employed, using bivariate regressions with sampling weights. The figures in Table 2 indicate that the majority of self-employed workers in the two study countries are adults aged 25–64 years, predominantly in the lower-tier informal work status, the average age being 38–42 years. A small proportion of workers are young (aged 15–24) or old adults (aged 65 and above), with a greater proportion of them employed in the lower-tier informal work status in both countries. Women are fairly represented among the self-employed workers, with again a greater proportion in the lower-tier work status, the difference being statistically significant. We also note that a majority of workers are heads of households, significantly found in upper-tier informal or formal work statuses.

Table 2 also shows that 20–52 per cent of self-employed workers in Niger have at least a primary education, i.e. 2–7 years of education.<sup>4</sup> It is observed in both countries that most self-employed workers are able to read or write in at least one language and that the educated are more represented in the formal and upper-tier informal work statuses in that order of importance. In Mali, youth and adult self-employed workers (aged 15–64) and those who have some formal education are equally found in both informal statuses.

The distribution of self-employed workers by their main branch of activity indicates that most self-employed workers operate in sales (39–58 per cent), both in Niger and in Mali. The second predominant branch of activities is services in Niger (25–32 per cent) and manufacturing and construction in Mali (21–38 per cent). Self-employed workers operating in food processing are found mostly in the lower-tier informal status in both countries.

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<sup>4</sup> The survey in Mali did not collect data on the level of education of the self-employed. Instead, we have used the information on the question of whether they studied in a school or on a private course.

Table 2: Self-employed workers' profiles and branch of activity by work status

	First survey round				Second survey round			
	Work status				Work status			
	All	Formal	Upper-tier informal	Lower-tier informal	All	Formal	Upper-tier informal	Lower-tier informal
	<b>2011</b>				<b>2014</b>			
<b>Niger (N=#)</b>	(3727)	(157)	(949)	(2621)	(2885)	(50)	(787)	(2048)
Self-employed is woman	0.46	0.39	0.29	0.53 ***	0.45	0.12	0.28	0.52 ***
Self-employed is married	0.79	0.83	0.79	0.78	0.81	0.88	0.83	0.80
Self-employed is head of HH	0.52	0.61	0.68	0.46 ***	0.55	0.78	0.70	0.49 ***
Age of self-employed (mean)	39.71	42.94	38.87	39.82	41.71	43.44	41.84	41.62
15–24 yrs	0.12	0.09	0.11	0.12	0.08	0.08	0.06	0.09 **
25–34 yrs	0.29	0.20	0.30	0.29	0.27	0.10	0.26	0.27
35–64 yrs	0.53	0.61	0.55	0.52	0.59	0.78	0.63	0.57 ***
65+ yrs	0.06	0.10	0.03	0.07 ***	0.06	0.04	0.05	0.07 **
Self-employed can read or write	0.32	0.44	0.37	0.29 ***	0.35	0.72	0.45	0.31 ***
Education of self-employed (years)	2.23	3.48	2.72	1.98 ***	2.22	7.10	3.04	1.78 ***
Self-employed has at least primary education level	0.25	0.34	0.29	0.23 ***	0.24	0.52	0.33	0.20 ***
Branch of activity: food processing	0.14	0.11	0.12	0.15 ***	0.13	0.04	0.09	0.14 ***
Branch of activity: manufacture /construction	0.20	0.11	0.17	0.21	0.17	0.06	0.13	0.19
Branch of activity: sales	0.42	0.52	0.46	0.39 ***	0.43	0.58	0.51	0.40 ***
Branch of activity: services	0.25	0.25	0.25	0.25	0.27	0.32	0.27	0.27
	<b>2014</b>				<b>2017</b>			
<b>Mali (N=#)</b>	(2675)	(120)	(790)	(1765)	(952)		(482)	(470)
Self-employed is woman	0.45	0.23	0.34	0.51 ***	0.43	na	0.28	0.58 ***
Self-employed is married	0.80	0.86	0.81	0.80	0.82	na	0.82	0.82
Self-employed is head of HH	0.46	0.61	0.56	0.40 ***	0.44	na	0.51	0.36 ***
Age of self-employed (mean)	40.28	40.27	40.15	40.34	40.86	na	41.01	40.69
15–24 yrs	0.12	0.11	0.11	0.13	0.10	na	0.10	0.11
25–34 yrs	0.25	0.26	0.25	0.24	0.25	na	0.25	0.25
35–64 yrs	0.57	0.60	0.59	0.56	0.58	na	0.59	0.57
65+ yrs	0.06	0.03	0.05	0.07 *	0.06	na	0.06	0.07
Self-employed can read or write	0.37	0.58	0.41	0.33 **	0.49	na	0.53	0.44 ***
Self-employed has studied in formal school	0.32	0.53	0.35	0.29	0.43	na	0.46	0.40
Branch of activity: food processing	0.01	0.00	0.01	0.01	0.04	na	0.03	0.05 **
Branch of activity: manufacture /construction	0.35	0.21	0.30	0.38	0.30	na	0.27	0.33
Branch of activity: sales	0.46	0.56	0.52	0.42 *	0.48	na	0.51	0.45 **
Branch of activity: services	0.18	0.23	0.17	0.18	0.18	na	0.20	0.17

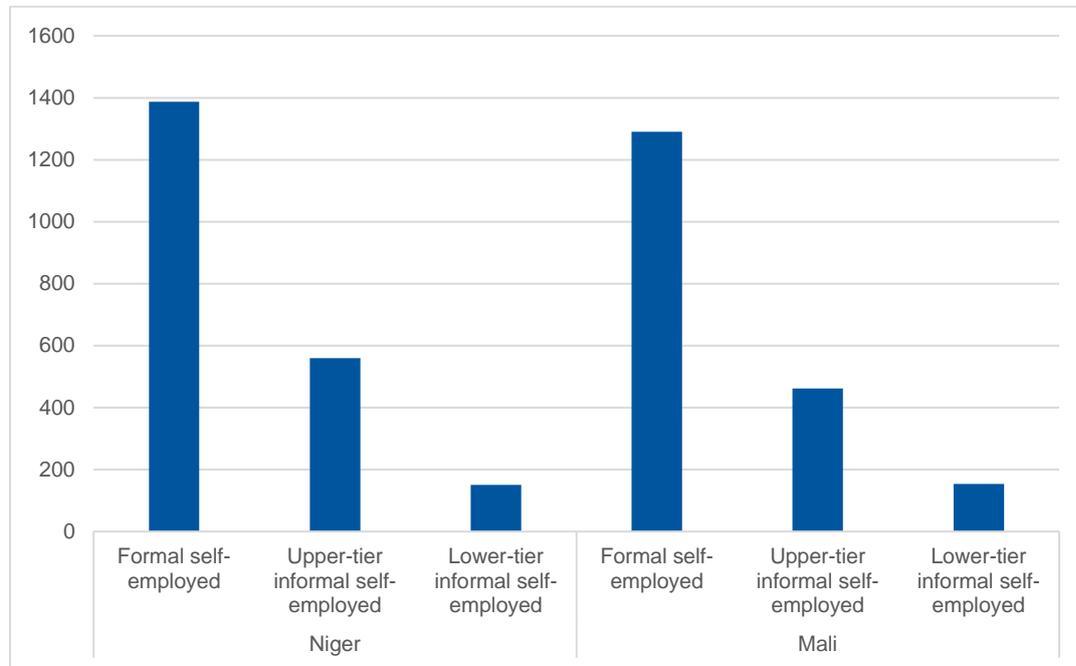
Note: 'na' means 'not available' due to missing data on variables related to formal work status (see Table 1). Significant differences across informal work statuses are tested using bivariate regressions and sampling weights. Significant levels are indicated by \*\*\* p<0.01, \*\* p<0.05, \* p<0.10.

Source: authors' calculations based on LSMS-ISA data for Mali and Niger.

## 4.2 Earnings and dispersal in earnings-related variables

Figure 1 presents the earnings (gross revenue) from self-employment in Niger and Mali. Average earnings are calculated for each country on the pooled sample (two rounds combined), adjusted for inflation and converted to 2017 US\$ values. Observations with zero earnings and with outlier values are not considered.

Figure 1: Mean earnings by work status, Niger and Mali



Source: authors' illustration based on LSMS-ISA data for Mali and Niger.

Figure 1 shows the same trend in monthly average earnings in both countries: on average, formal self-employment work pays more than informal work of either status. Within the informal work statuses, upper-tier informal self-employed workers earn more than lower-tier informal self-employed workers.

Table 3 summarizes the earnings disaggregated by gender of self-employed workers and the branches of their activity. Overall, the trend observed above is consistent within the disaggregated groups of self-employed workers. In addition, irrespective of work status, self-employed men earn higher revenues in both countries. This echoes the common trend observed in SSA and Latin American countries (Bruhn 2009; Nix et al. 2015). Regarding branches of activity, formal work status offers the highest earnings in both countries within all branches except food processing, where high incomes are also observed in the upper-tier informal work status. Note, however, that the difference in average earnings between the formal and the upper-tier work statuses is slight. Note also that average earnings in the formal status (upper-tier informal status) in Mali may be underestimated (overestimated) as the data derive only from the first survey, for the reasons explained in the previous section. The comparison within work statuses shows that, in most cases, sales generate the highest average incomes when compared with other activities.

Table 3: Average monthly earnings from self-employment, by gender and branch of activity (US\$ 2017)

	All self-employed workers	By gender of self-employed worker		By branch of activity			
		Women	Men	Food processing	Manufacture and construction	Sales	Services
<b>Niger</b>	<b>(N = 6418)</b>						
All enterprises	274.46	97.53	410.81	151.41	169.99	456.10	135.80
Formal	1386.62	415.28	1935.35	385.32	1418.92	1966.97	659.25
Upper-tier informal	559.94	173.70	685.77	392.39	434.71	799.39	266.97
Lower-tier informal	151.05	78.52	222.40	97.51	61.62	261.62	81.98
<b>Mali</b>	<b>(N = 2414)</b>						
All enterprises	352.63	132.38	553.41	136.28	274.00	434.08	290.76
Formal	1290.40	249.48	1571.39	52.24	2247.72	988.57	590.20
Upper-tier informal	462.22	168.83	620.61	448.48	331.64	544.36	424.39
Lower-tier informal	153.90	90.43	232.23	94.13	106.31	175.98	197.27

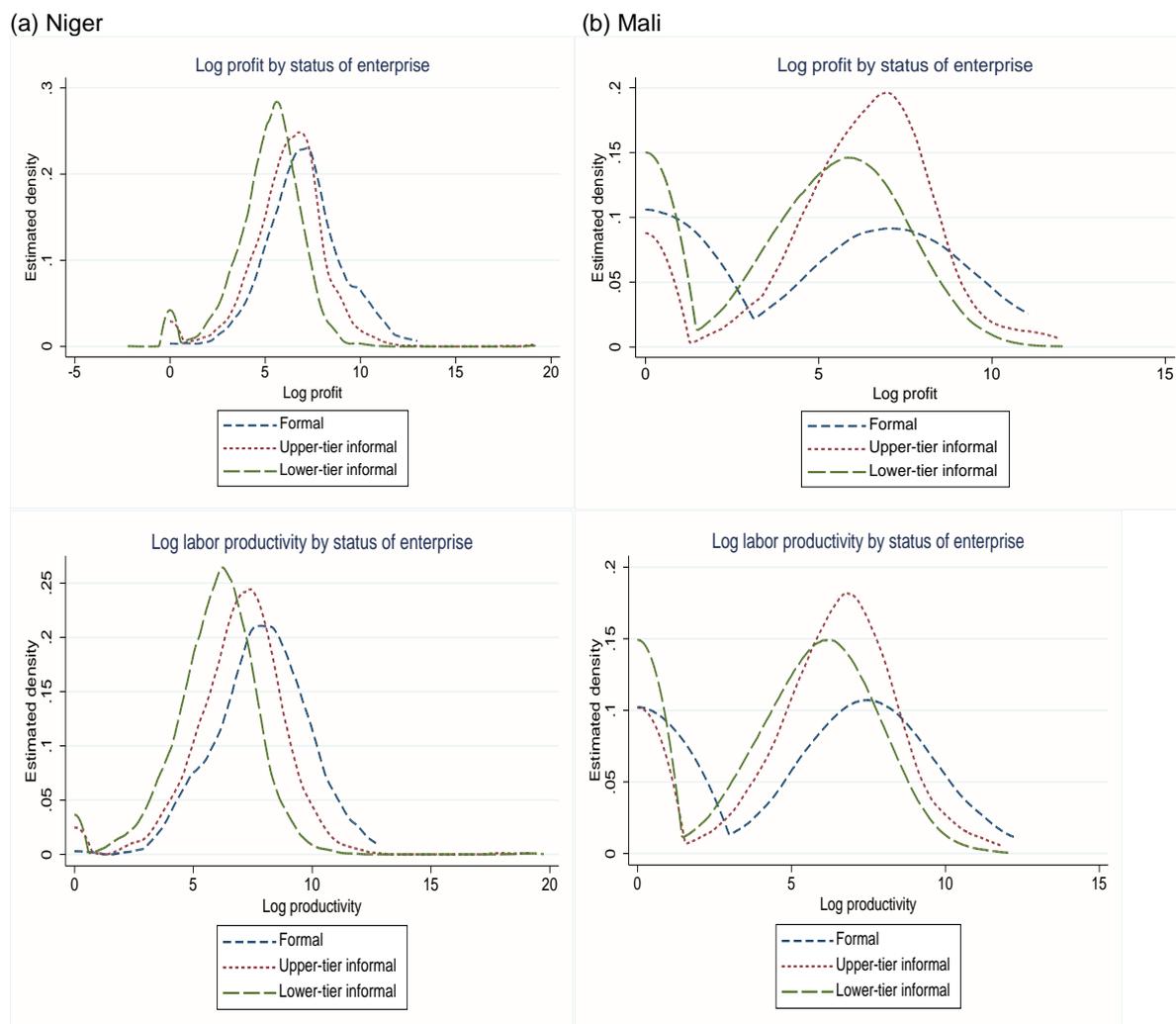
Note: statistics are presented on the pooled sample (two rounds combined).

Source: authors' calculations based on LSMS-ISA data for Mali and Niger.

It must be remembered that the workers considered in our study are self-employed—either own-account workers or owners (employers)—and as such likely to bear costs. With this in mind, we explore the heterogeneity in work status observed above using two additional indicators related to earnings: profit and labour productivity. Profit is defined as the net revenue from self-employment activity, which equals the gross revenue minus the total cost of operating the activity. We define labour productivity as the gross revenue divided by the number of workers used in operating the activity, including family labour and the owner. Figure 2 shows the dispersal of profit and labour productivity by work status in the two countries using the pooled data with the two rounds combined and kernel density estimates.

Figure 2 shows large differences in profit and labour productivity between work statuses, with more pronounced trends in Mali for both profit and labour productivity, and, within Niger, for labour productivity. Overall, lower-tier informal (formal/upper-tier informal) self-employed workers have lower (higher) profits and labour productivity—a finding consistent with our expectation and evidence reported in previous studies (Benjamin and Mbaye 2012; Bezu and Barrett 2012). Differences in the educational level of the workers may be one explanation of this. Based on the assumption that managerial capacity is important for productivity, Nagler and Naudé (2017), using LSMS-ISA data for four anglophone African countries, found that literate self-employed workers, proxied by the ability to read and write, operate more productively. This is consistent with our data, as we found that self-employed workers who were able to read and write were more represented in the formal and in upper-tier informal work statuses in both countries (Table 2). The labour productivity pattern is also consistent among self-employed women and men, but with more dispersal and wider variance for women (Figure A1).

Figure 2: Profit and productivity dispersal by work status



Source: authors' illustration based on LSMS-ISA data for Mali and Niger.

## 5 Dynamics of off-farm self-employment work

We also analysed the transition of self-employed workers from one work status to another between the two survey rounds. As explained in the data section, we focused on the panel database of Niger with the 1465 identical self-employed workers followed in the two surveys.

### 5.1 Transition probabilities and livelihoods

Table 4 reports the transition probabilities between different work statuses in Niger from 2011 to 2014. The cells in the shaded area of the table indicate the percentage of self-employed moving from work status  $i$  in 2011 to work status  $j$  in 2014. The rows refer to the number of self-employed workers in each initial work status in 2011 and sum to 100 per cent. The column totals thus show the percentage of self-employed workers who moved into work status  $j$  in 2014. The proportion of workers who stayed in their initial work status is calculated as the product of the transition matrix diagonals and the initial share of workers.

Table 4: Transition probabilities for self-employed workers in Niger (in %)

Work status in 2011	Work status in 2014			Total % (N)	Share of stayers %
	Formal	Upper-tier informal	Lower-tier informal		
Formal	13.41	41.46	45.12	100 (82)	0.75
Upper-tier informal	3.26	51.74	45	100 (460)	16.24
Lower-tier informal	0.98	20.04	78.98	100 (923)	49.76
Total %	2.39	31.19	66.42	100 (1465)	66.75

Source: authors' calculation based on LSMS-ISA data for Niger.

Table 4 shows that more than half of self-employed workers did not change work status in 2014 (66.75 per cent), the majority of the stayers being found in the lower-tier informal status (49.76 per cent). However, looking at the transitions between work statuses, there is a non-negligible proportion of self-employed workers that moved from their initial work status to alternatives. Of the 923 self-employed in the lower-tier informal work status in 2011, 20.04 per cent and 0.98 per cent were able to transit to upper-tier informal work status and formal work status, respectively. Of the 460 self-employed in the upper-tier informal work status in 2011, 3.26 per cent were able to transit to formal work status. The frequency of self-employed workers exiting the upper-tier informal and formal statuses is higher than the frequency of upper-tier informal self-employed workers entering the formal work status, suggesting the difficulty of moving to a higher work status and the existence of factors or forces pushing or maintaining self-employed workers in a lower work status. This tendency may be explained by workers' gender and household-related factors.

We therefore first disaggregate the transition matrix by the sex of self-employed workers. Table 5 shows that the percentage of self-employed women that moved to the lower-tier informal work status is even higher and the percentage of self-employed women that transited to a higher work status is even lower than those observed in the whole sample of self-employed workers. This transition movement is contrary to that observed for self-employed men (Table 5).

Table 5: Transition probabilities by sex of self-employed workers in Niger (in %)

Work status in 2011	Work status in 2014			Total % (N)	Share of stayers %
	Formal	Upper-tier informal	Lower-tier informal		
<b>Self-employed women</b>					
Formal	4.17	4.17	91.67	100 (24)	0.18
Upper-tier informal	1.87	37.38	60.75	100 (107)	7.05
Lower-tier informal	0	11.93	88.07	100 (436)	67.72
Total %	0.53	16.4	83.07	100 (567)	74.95
<b>Self-employed men</b>					
Formal	17.24	56.9	25.86	100 (58)	1.11
Upper-tier informal	3.68	56.09	40.23	100 (353)	22.05
Lower-tier informal	1.85	27.31	70.84	100 (487)	38.42
Total %	3.56	40.53	55.9	100 (898)	61.58

Source: authors' calculations based on LSMS-ISA data for Niger.

Second, we compare the mean initial household endowment (human and physical capital) across work statuses in the first survey round (Table 6). Human capital consists of labour and education. Labour is defined as the number of adult household members. Education is defined as the shares of adult household members having a primary education level vs. having at least a secondary level of education. Physical capital are land per adult equivalent, tropical livestock unit, and per adult equivalent value of household assets such as vehicles, dwelling, furniture, and appliances. Table 6

shows that households in the formal work status have significantly higher human capital (labour and adult share with a primary education level), higher assets, and lower land endowments than those in the informal work statuses. Households in the upper-tier informal work status have a significantly higher adult share above a primary education level and higher assets than those in the lower-tier informal work status.

Table 6: Initial household endowment by work status in Niger in 2011

	Work status in 2011							
	Formal (82)			Upper-tier informal (460)			Lower-tier informal (923)	
	Mean	SE		Mean	SE		Mean	SE
Adult household members (#)	3.70	0.25	**	3.16	0.13		3.05	0.06
Adult with primary education (share)	0.17	0.03	*	0.14	0.01		0.12	0.01
Adult above primary education (share)	0.09	0.02		0.09	0.01	**	0.06	0.01
Livestock (tropical livestock unit)	3.24	0.80		3.02	0.43		2.68	0.17
Land holding (hectares)	3.96	0.67	**	4.76	1.11		4.68	0.25
Value of assets owned (in 1000 FCFA)	359.8	74.0	***	375.8	202.4	***	250.5	108.0

Note: 'SE' means standard errors. Significant differences between the higher work statuses and the lower-tier informal work status are tested using bivariate regressions and sampling weights. Significant levels are indicated by \*\*\* p<0.01, \*\* p<0.05, \* p<0.10.

Source: authors' calculations based on LSMS-ISA data for Niger.

Overall, self-employed workers initially in the higher work statuses possessed significantly higher household human and physical capital than self-employed workers initially in the lower-tier informal work status. Moreover, compared with those who stayed in their initial work status in 2014, formal and upper-tier informal self-employed workers who transitioned into the lower-tier informal work status had significantly lower mean initial household endowments of education and assets (Table 7). This supports the finding in the non-farm employment literature that possession or accumulation of capital is necessary for low-return non-farm employment to enter high-return non-farm employment (Bezu and Barrett 2012).

Table 7: Initial household endowment by transition into lower-tier informal work status

	Formal and upper-tier informal work statuses (493)					
	Stayed (249)		Moved (244)			
	Mean	SE	Mean	SE		
Adult household members (#)	3.43	0.23	3.08	0.13		
Adult with primary education (share)	0.17	0.02	0.12	0.02	**	
Adult above primary education (share)	0.13	0.02	0.06	0.01	***	
Livestock (tropical livestock unit)	3.38	0.87	3.02	0.35		
Land holding (hectares)	0.74	0.11	1.77	0.57	*	
Value of assets (in 1000 FCFA)	97.95	20.87	29.80	3.64	***	

Note: 'SE' means standard errors. Significant differences are tested using bivariate regressions and sampling weights. Significant levels are indicated by \*\*\* p<0.01, \*\* p<0.05, \* p<0.10.

Source: authors' calculations based on LSMS-ISA data for Niger.

## 5.2 Correlates of moving into upper-tier informal and formal work statuses

We next determine the factors that explain the transition of self-employed workers from the lower-tier informal work status to formal and upper-tier informal work statuses. We pull the samples of formal and upper-tier informal work statuses together because of the small sample size of the

former. We thus estimate the probability of self-employed workers moving from the lower-tier informal work status in the first panel round to a higher work status in the second panel round as:

$$P(\text{moved into formal or upper – tier informal work status}_{i,2014} = 1 \mid \text{being in lower – tier informal work status}_{i,2011} = 1) = \alpha X_{i,2011} + u_{i,2014} \quad (1)$$

where  $\alpha$  is a vector of the parameters to be estimated and  $u_i$  the error terms.  $X_i$  is a set of explanatory variables defined at the previous survey round (2011) to reduce potential reverse causality bias. These variables are human and physical capital, worker and household characteristics, and shocks experienced by the households during the 12 months prior to the second survey round. Regarding financial capital, the dataset for Niger did not record any questions that might allow an assessment of access to finance, except information on the main source of financing self-employment work, recorded only in the second round of the survey. According to this 2014 survey round, financing stemmed mostly from savings and gifts from parents and relatives (88 per cent of the 1465 self-employed workers of our panel data). Only in a few cases (5 per cent) did financing come from a loan. We therefore use household income from non-employment work as a proxy for access to financial capital.

The model (1) is estimated using a probit regression. The model was run on the sample of lower-tier informal self-employed workers in 2011 and explains why some moved to a higher work status while others did not transit at all. Results are presented in Table 8 with different specifications, first including only household characteristics (column 1), then adding other businesses activity characteristics (column 2), community variables (column 3), shocks experienced by the households the workers belong to (column 4), and interaction between some shocks and wealth variables (column 5). Standard errors are adjusted for cluster within households in all regressions.

Table 8: Probit estimation of correlates of moving into upper-tier informal or formal work status

	(1)	(2)	(3)	(4)	(5)
Worker is male	0.837*** (0.178)	0.815*** (0.188)	0.790*** (0.188)	0.810*** (0.187)	0.843*** (0.185)
Worker is married	-0.161 (0.225)	-0.153 (0.234)	-0.141 (0.234)	-0.217 (0.241)	-0.238 (0.242)
Age of worker: 25–34 yrs (ref. 15–24 yrs)	0.885** (0.395)	0.942** (0.397)	0.921** (0.406)	0.894** (0.398)	0.811** (0.406)
Age of worker: 35–64 yrs	0.896** (0.364)	0.847** (0.378)	0.837** (0.383)	0.817** (0.373)	0.735* (0.383)
Age of worker: 65+ yrs	-0.258 (0.429)	-0.430 (0.482)	-0.411 (0.483)	-0.394 (0.477)	-0.463 (0.491)
Education of worker (years)	0.013 (0.030)	0.013 (0.032)	0.011 (0.031)	0.014 (0.030)	0.016 (0.030)
Worker can read or write in any language	-0.180 (0.173)	-0.168 (0.177)	-0.141 (0.176)	-0.160 (0.173)	-0.172 (0.174)
Number of adults in household	-0.034 (0.047)	-0.028 (0.050)	-0.033 (0.049)	-0.025 (0.049)	-0.014 (0.050)
Number of dependants in household	-0.072*** (0.028)	-0.071** (0.028)	-0.074*** (0.028)	-0.074*** (0.027)	-0.073*** (0.028)
Adult with primary education (share)	0.361 (0.352)	0.351 (0.368)	0.376 (0.365)	0.361 (0.379)	0.352 (0.377)
Adult above primary education (share)	-0.562 (0.502)	-0.638 (0.506)	-0.709 (0.507)	-0.647 (0.491)	-0.767 (0.501)
Ethnicity: Haoussa	0.396**	0.353*	0.369*	0.348*	0.371*

	(0.200)	(0.208)	(0.208)	(0.211)	(0.218)
Ethnicity: Djema	-0.327	-0.359	-0.271	-0.335	-0.330
	(0.245)	(0.256)	(0.252)	(0.256)	(0.259)
Ethnicity: Touareg	-0.085	-0.134	-0.092	-0.173	-0.155
	(0.295)	(0.314)	(0.315)	(0.315)	(0.316)
Wealth (index)	0.071*	0.071*	0.073*	0.076*	0.105**
	(0.043)	(0.043)	(0.043)	(0.043)	(0.044)
Livestock (tropical units)	0.007	-0.001	-0.003	-0.003	-0.032
	(0.015)	(0.015)	(0.015)	(0.016)	(0.024)
Log (non-labour income)	-0.024**	-0.027**	-0.026**	-0.028**	-0.032**
	(0.012)	(0.012)	(0.012)	(0.012)	(0.013)
Age of business activity (years)		0.011	0.012	0.011	0.009
		(0.008)	(0.008)	(0.008)	(0.008)
Log (annual earnings from self-employment)		0.059**	0.065**	0.063**	0.063**
		(0.029)	(0.030)	(0.030)	(0.031)
Distance (km) to nearest major road			0.010	0.011	0.010
			(0.007)	(0.007)	(0.007)
Distance to nearest market			0.001	0.002	0.002
			(0.002)	(0.002)	(0.002)
Finance institution exists in community			-0.201	-0.156	-0.107
			(0.206)	(0.210)	(0.208)
Community radio exists in community			0.359	0.392	0.438*
			(0.242)	(0.242)	(0.246)
Public transport passes through community			0.017	0.038	0.018
			(0.151)	(0.148)	(0.149)
Geo. shock: drought/flood				0.282*	-0.100
				(0.149)	(0.209)
Idiosync. shock: death/illness				0.231	0.206
				(0.172)	(0.173)
Price shock: food, input, output				0.089	0.108
				(0.143)	(0.143)
Income shock: loss of revenue from non-farm activity				-0.444*	-0.978***
				(0.228)	(0.300)
Geo. Shock*Wealth					-0.210*
					(0.122)
Geo. Shock*Livestock					0.083**
					(0.040)
Income Shock*Log (non-labour income)					0.079**
					(0.040)
Rural	-0.604***	-0.596***	-0.752***	-0.805***	-0.820***
	(0.166)	(0.172)	(0.214)	(0.214)	(0.218)
Constant	-1.423**	-2.195***	-2.540***	-2.423***	-2.431***
	(0.556)	(0.600)	(0.668)	(0.695)	(0.724)
Number of observations	923	876	876	876	876
McFadden's (Pseudo) R2	0.17	0.18	0.19	0.21	0.22
Log pseudolikelihood	-281990.87	-268787.17	-266202.55	-260913.19	-256898.51

Note: wealth index is calculated as the first principal component of household assets such as vehicles, dwelling, furniture, and appliances. Region dummies are included in the regressions. Survey weights were used. Standard errors, adjusted for clusters within household, in parentheses. Explanatory variables are lagged with three time periods (from the first survey round 2011). Significant levels are indicated by \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.10$ .

Source: authors' calculations based on LSMS-ISA data for Niger.

Table 8 shows that workers' gender and age are significantly correlated with moving into formal and upper-tier informal work status. Self-employed men in the lower-tier informal work status are more likely than women to move out of this work status. Most self-employed women operate their businesses from a fixed dwelling, which is a specific characteristic of the lower-tier informal work status. As those who generally take care of the family, they may not be able to move their business activities to fixed locations outside the dwelling, where most upper-tier informal workers run their business activities. Compared with the other age groups, younger and older self-employed workers are also less likely to move out of the lower-tier informal worker status.

Household characteristics and initial wealth endowment are also drivers of the transition movement. Lower-tier informal self-employed workers belonging to households with a higher share of dependants are less likely to exit the lower-tier informal work status. More dependants in the household may indicate low availability of the potential labour endowment required for higher work statuses. Self-employed workers belonging to the Haoussa ethnicity (whose members have historically been principally involved in marketing activities) are more likely to transit into the formal and upper-tier informal work statuses, suggesting the positive role of social capital not only in off-farm businesses development in Niger (Dedehouanou et al. 2018) but also in off-farm employment dynamics.

Initial asset holdings in terms of wealth are positively associated with transition out of lower-tier work status, consistent with previous results found in Ethiopia (Bezu and Barrett 2012). Initial earnings from self-employment are likely to induce a move out of the lower-tier informal work status to a higher work status, probably because more productive self-employed workers have a potential to grow their business activity and are thus able to become employers and comply with the regulations formal and upper-tier informal self-employed workers are subject to. This is in line with the study by McCaig and Pavcnik (2017), which showed that initially performant self-employed workers in Viet Nam are more likely to become formal workers and employers.

An increase in household non-labour income itself is less likely to make lower-tier informal self-employed workers transit. However, in column 5, the coefficient of the interaction term between income shock and initial household non-labour income is positive. Thus, for lower-tier informal self-employed workers belonging to households that have experienced an income shock, higher initial household non-labour income is deemed to be a factor likely to favour transition into formal and upper-tier informal work statuses. This suggests the role of non-labour income in mitigating income shocks that might otherwise keep workers in the lower-tier informal work status.

Covariate shocks also affect the transition movement. For lower-tier informal self-employed workers belonging to households that have experienced natural disasters such as floods, droughts, or pest infestations, a higher initial livestock endowment is positively related to movement into a higher work status. The existence of a community radio in the village or neighbourhood is likely to favour transition out the lower-tier work status, suggesting the importance of information transfer in employment dynamics.

Table 9 presents heterogeneous results by sex of self-employed worker and by geographical location of business activity. As the age of both female and male self-employed workers increases, the likelihood of the transition into higher statuses increases, but with a return effect as age reaches a certain level. There are some significant differences between female and male lower-tier informal self-employed workers in terms of the factors moving them into higher statuses. Table 9 shows that married men are more likely than married women to transit out of the lower-tier informal work status. Literate men, members of households with a higher share of dependants, and men living in rural areas are less likely to move out the lower-tier informal work status. Men with a long history of self-employment, men belonging to the Haoussa ethnicity, and men living in households

with a high initial level of wealth are more likely to transit to higher work statuses. Compared with male business owners, where no significant results are found, performant female workers with previously or initially high annual business revenues are more likely to move into a higher work status. Information transfer is also an important factor in the transition out of the lower-tier informal status for self-employed women. For female workers belonging to households that have experienced negative consequences of aggregate shocks, higher initial wealth (livestock) endowment is negatively (positively) related to the transition to higher statuses, suggesting the mitigating role of livestock over wealth.

Examining the results disaggregated by location, Table 9 also shows significant differences in terms of human capital, financial capital, and shocks. Regarding labour, urban self-employed workers with a high initial household labour endowment are less likely to move out of the lower-tier informal work status. Rural self-employed workers with a high initial household share of dependants are also less likely to move out of the lowest work status. Education—even primary school completion—is a significant factor explaining the likelihood of self-employed workers transiting into the formal and upper-tier informal work statuses, especially in urban areas. High initial/previous annual income from self-employment in urban zones is positively correlated with the likelihood of transiting to a higher work status. Unexpected idiosyncratic shocks are likely to cause urban self-employed workers to stay and rural self-employed workers to transit.

Table 9: Probit estimation of correlates of moving into upper-tier informal or formal work statuses, by sex of workers and location

	By sex of self-employed worker		By location	
	Men	Women	Urban	Rural
Worker is male			1.411*** (0.220)	0.776*** (0.262)
Worker is married	0.866** (0.391)	-0.430 (0.297)	-0.167 (0.252)	-0.336 (0.449)
Age of worker	0.108** (0.045)	0.105** (0.052)	0.123*** (0.045)	0.142*** (0.050)
Age of worker square	-0.001*** (0.000)	-0.001* (0.001)	-0.001** (0.000)	-0.002*** (0.001)
Education of worker (years)	0.046 (0.039)	-0.014 (0.042)	-0.010 (0.033)	0.043 (0.049)
Worker can read or write in any language	-0.379* (0.203)	0.069 (0.338)	-0.358 (0.244)	-0.127 (0.229)
Number of adults in household	0.070 (0.076)	-0.030 (0.064)	-0.163** (0.063)	0.015 (0.078)
Number of dependants in household	-0.097*** (0.037)	-0.050 (0.042)	0.037 (0.039)	-0.144*** (0.038)
Adult with primary education (share)	-0.285 (0.474)	0.670 (0.424)	1.142*** (0.410)	-0.088 (0.646)
Adult above primary education (share)	-0.945 (0.774)	-0.635 (0.685)	0.684 (0.539)	-1.963* (1.095)
Ethnicity: Haoussa	0.764*** (0.274)	-0.222 (0.348)	-0.098 (0.285)	1.165*** (0.398)
Ethnicity: Djema	-0.373 (0.344)	-0.301 (0.384)	-0.123 (0.327)	0.273 (0.460)
Ethnicity: Touareg	-0.295 (0.351)	0.548 (0.506)	0.036 (0.380)	0.369 (0.534)
Wealth (index)	0.203* (0.106)	0.016 (0.060)	0.095** (0.045)	0.261* (0.135)
Livestock (tropical units)	-0.015 (0.027)	-0.107 (0.069)	-0.020 (0.043)	-0.053 (0.035)
Log (non-labour income)	-0.041** (0.017)	-0.045* (0.025)	-0.019 (0.019)	-0.036** (0.017)
Age of business activity (years)	0.021** (0.010)	-0.016 (0.015)	-0.010 (0.013)	0.017 (0.011)
Log (annual earnings from self-employment)	0.058 (0.040)	0.156** (0.071)	0.109*** (0.042)	0.044 (0.046)
Distance (km) to nearest major road	0.011 (0.009)	-0.012 (0.014)	-0.066 (0.091)	0.009 (0.008)
Distance to nearest market	0.005* (0.003)	0.000 (0.004)	0.007 (0.004)	0.003 (0.003)
Finance institution exists in community	-0.057 (0.292)	-0.386 (0.368)	0.152 (0.224)	-0.154 (0.539)
Community radio exists in community	0.036 (0.324)	0.835** (0.371)	-0.236 (0.321)	1.214*** (0.423)
Public transport passes through community	-0.031 (0.193)	-0.169 (0.290)	0.268 (0.254)	0.043 (0.191)
Geo. shock: drought/flood	0.220 (0.269)	-2.127*** (0.815)	-0.229 (0.344)	-0.222 (0.366)

Idiosync. shock: death/illness	0.130 (0.245)	0.302 (0.332)	-0.513* (0.264)	0.479** (0.227)
Price shock: food, input, output	0.232 (0.194)	-0.257 (0.293)	-0.081 (0.207)	0.148 (0.186)
Income shock: loss of revenue from non-farm activity	-0.791** (0.332)	-2.457*** (0.666)	-0.366 (0.329)	-3.251* (1.896)
Geo. Shock*Wealth	-0.121 (0.162)	-1.397** (0.550)	-0.001 (0.135)	-0.344 (0.222)
Geo. Shock*Livestock	0.062 (0.055)	0.216** (0.084)	-0.233 (0.226)	0.124** (0.053)
Income Shock*Log (non-labour income)	0.085* (0.052)	0.193*** (0.062)	-0.017 (0.041)	0.327* (0.188)
Rural	-1.219*** (0.293)	-0.078 (0.318)		
Constant	-4.342*** (1.405)	-5.112*** (1.529)	-6.142*** (1.419)	-5.409*** (1.452)
Number of observations	466	403	344	532
McFadden's (Pseudo) R <sup>2</sup>	0.25	0.33	0.32	0.27
Log pseudolikelihood	-171397.59	-54192.48	-54877.8	-174404.61

Note: wealth index is calculated as the first principal component of household assets such as vehicles, dwelling, furniture, and appliances. Region dummies are included in the regressions. Survey weights were used. Standard errors, adjusted for clusters within household, in parentheses. Explanatory variables are lagged with three time periods (from the first survey round 2011). Significant levels are indicated by \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.10$ .

Source: authors' calculations based on LSMS-ISA data for Niger.

## 6 Conclusions

Evidence that the majority of self-employment work in most developing countries remains informal has prompted several attempts to encourage formalization reforms, with mixed results (Bruhn and McKenzie 2014; McCaig and Nanowski 2019; McKenzie and Sakho 2010). We have addressed the nature of informal self-employment work in two fragile and conflict-affected countries in the West African Sahel—Mali and Niger. In doing so, we have gone beyond the duality of formal vs. informal employment that is common in the literature. We have differentiated informal non-farm self-employed workers into lower-tier and upper-tier work statuses and have analysed mobility, and the factors explaining it, between work statuses.

We find that a key characteristic of self-employed workers is the location of their business activities, with more than a third of workers employed in mobile/itinerant microenterprises. Given that this type of business requires low capital and skills, it is not surprising that the majority of self-employed workers are found in the lower-tier informal work status, especially in Niger (70 per cent). Self-employed women, self-employed workers in rural areas, youth and young adult self-employed workers (aged 15–24), and older adult self-employed workers (aged 65 and above) are mostly found in the lower-tier informal status in Niger and Mali. Although in both countries most self-employed workers are able to read or write at least one language, educated workers are more represented in the formal and upper-tier informal work statuses. On average, monthly average earnings are higher in the formal work status than in the informal work statuses. Within the informal statuses, upper-tier informal self-employed workers earn more than lower-tier informal self-employed workers. The comparison within work statuses shows that, in most cases, activities involving sales generate the highest average incomes within, compared with other activities.

We also found that more than half of self-employed workers did not change their work status between survey rounds, the majority of the ‘stayers’ being in the lower-tier informal status. The transition out of upper-tier informal and formal work statuses is higher than the transition into these ‘high’ work statuses, suggesting the existence of factors or forces pushing or maintaining self-employed workers in the ‘low’ work status. Overall, self-employed workers initially in higher work statuses possess significantly higher household human and physical capital than those initially in the lower-tier informal work status, suggesting that possession of human and physical capital is necessary for self-employed workers to transit out of the lower-tier informal work status. Consistent with the regression results, we found that household characteristics, initial asset holdings, and initial earnings from self-employment are drivers of the transition out of the lower-tier informal work status. The regression results showed the mitigating role of household non-labour income on income shocks (unexpected loss of revenue from non-agricultural and salaried activities) that might prevent self-employed workers from moving out of the lower-tier informal work status.

Finally, we found significant differences between urban and rural workers and between women and men in the lower-tier informal status in terms of the factors likely to move them into higher statuses. Self-employed men with a high initial level of wealth are more likely to transit. Rural self-employed workers and self-employed women with a high initial annual business revenue are also more likely to move up. For rural workers belonging to households that have experienced negative consequences of aggregate shocks and income shocks, a higher initial livestock endowment and non-labour income are factors that may prevent them from remaining stuck in the lower-tier informal work status.

These results indicate the heterogeneity of the groups of self-employed workers found in the lower-tier informal work status. These groups of individuals are the most vulnerable to shocks affecting their business activities. Given that the movement from the lower-tier informal work status to the upper-tier informal and formal work statuses is likely to be welfare improving, the results stress the importance of taking into account these specific groups of workers in designing policy interventions for transforming informal work and livelihoods—a fact further emphasized by the recent Covid-19 pandemic (Balde et al. 2020; Danquah et al. 2020). Household-related factors such as asset holdings, livestock endowment, and non-labour income may play a role in helping these vulnerable groups transit to a higher work status, even in the event of shocks.

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## Appendix

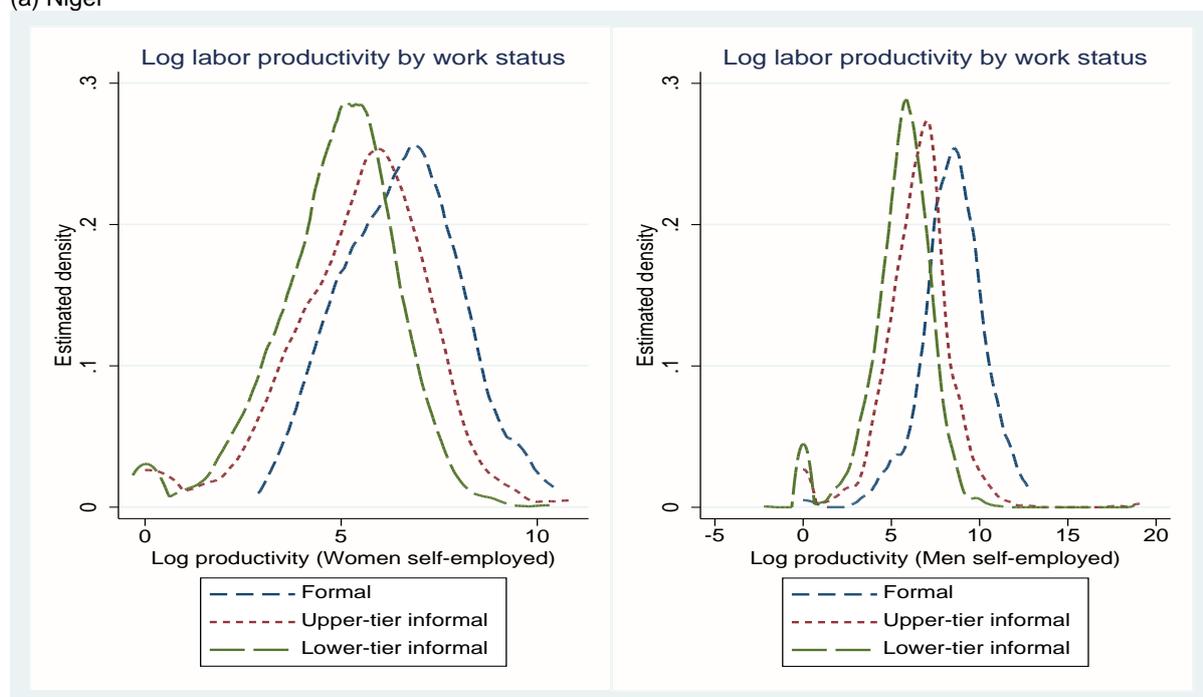
Table A1: Work statuses

Work status group	Definition/Operationalization
1. Formal	Own-account workers (with no salary) that (a) keep written accounts, (b) have a commercial register, or (c) hold a fiscal identification number given by the Directorate General of Taxes (DGI) Owners or employers (with at least one salaried worker) that follow at least one of the above regulations and have additionally registered worker(s) in the national social security fund
2. Upper-tier informal	Self-employed workers that do not comply with above regulations (in 1) but operate their businesses in fixed premises outside the dwelling
3. Lower-tier informal	Self-employed workers that do not comply with above regulations (in 1) but have no fixed business premises (outside the owner's dwelling) or are itinerant/mobile

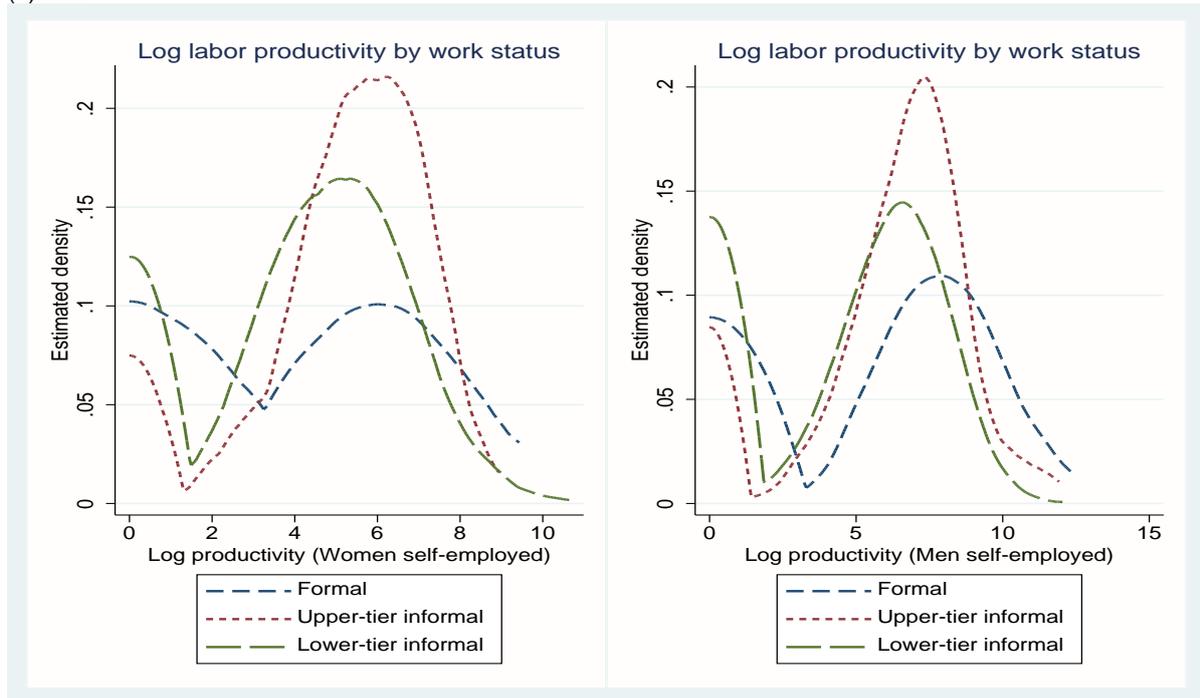
Source: authors' illustration based on LSMS-ISA data for Niger.

Figure A1: Labour productivity dispersal by gender of self-employed worker

(a) Niger



(b) Mali



Source: authors' illustration based on LSMS-ISA data for Mali and Niger.