ERF Working Papers Series

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ECONOMIC RESEARCH FORUM
منتدى البحوث الاقتصادية

Working Paper No. 1576
September 2022

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September 2022

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First published in 2022 by
The Economic Research Forum (ERF)
21 Al-Sad Al-Aaly Street
Dokki, Giza
Egypt
www.erf.org.eg

Abstract

Informality is prevalent in Tunisia, limiting the access of a large share of the population to social safety nets. The COVID-19 pandemic has demonstrated more than ever the importance of an inclusive and stable social protection system. Meanwhile, informal workers have been disproportionately affected by the health crisis, hence, extending social security coverage to workers in the informal sector is vital. This paper provides a brief overview of the existing social protection schemes and programs in Tunisia and aims to analyze challenges and opportunities for the extension of social protection to informal workers in the labor market, through studying the main characteristics of Tunisia's informal workforce and also the characteristics of those informal workers who have transitioned to formality. Finally, we provide policy recommendations tailored to Tunisia's current situation.

Keywords: Informal workers, informal economy, social protection coverage, social protection extension.
JEL Classifications: H55, O17, I18.

ملخص

ينتشر العمل بالقطاع غير الرسمي في تونس، مما يحد من وصول نسبة كبيرة من السكان إلى شبكات الأمان الاجتماعي. لقد أظهرت جائحة كوفيد-19 أكثر من أي وقت مضى أهمية وجود نظام شامل ومستقر للحماية الاجتماعية. وفي الوقت نفسه، تأثر العمال بالقطاع غير الرسمى بشكل أكثر من غيرهم بالأزمة الصحية، وبالتالي، فإن توسيع نطاق تغطية الضمان الاجتماعي ليشمل العاملين بالقطاع غير الرسمي أمر حيوي. تقدم هذه الورقة البحثية لمحة موجزة عن خطط وبرامج الحماية الاجتماعية القائمة في تونس، وتهدف إلى تحليل التحديات والفرص لتوسيع نطاق الحماية الاجتماعية لتشمل العمال غير الرسميين في سوق العمل، من خلال دراسة الخصائص الرئيسية للقوى العاملة غير الرسمية في تونس وكذلك خصائص العمال غير الرسميين الذين انتقلوا إلى القطاع الرسمى. وأخيرا، نقدم توصيات بشأن السياسات مصممة خصيصا للوضع الحالي في تونس.

Introduction

Informality is a critical issue in the Middle East and North Africa (MENA) region representing 68% of total employment (MENA-OECD, 2021). Informal workers, play an important role in Tunisian labor market and account for 46% of the workforce (World Bank, 2020a). Most of the countries in the MENA region have set up a social protection system but the coverage against various risks is very limited and only available to certain population segments. The COVID-19 pandemic highlighted the importance of enhancing the coverage of social protection and the provision of social safety nets for vulnerable population groups. A long history of economic investigations has examined the causes and consequences of informal employment throughout the region and the potential role that social insurance schemes play in curbing it.

Many challenges are present in Tunisia's current social protection system, both in terms of access and regarding the efficacy of the systems themselves. In regards to the latter issue, many of the relevant funds including CNSS, CNRPS, and CNAM have experienced fund deficits which threaten the access and quality of assistance and coverage they can provide. Furthermore, Tunisia's healthcare sector has long struggled to provide adequate care, particularly to the country's interior regions (as opposed to coastal regions). Additionally, in most cases Tunisia's social protection schemes do not provide unemployment insurance, leaving workers who lose their jobs without adequate support (United Nations, 2016).

Since informality is prevalent and so many social protection schemes are tied to employment, the majority of informal workers and their families are excluded from coverage. Some informal workers and their families do qualify for the non-contributory schemes targeted at poor and low-income Tunisians, but the remainder struggle to access social protection.

Informal workers[1] have limited access to social safety nets and given the fragile socio-economic conditions (ie: irregular income, frequent activity changes, absence of employer participation, etc.), extending social security coverage to workers in the informal sector is vital. The COVID-19 pandemic has demonstrated more than ever the importance of inclusive and stable social protection systems as informal workers have been disproportionately affected by the health crisis, and least likely to benefit from the state relief efforts (Marouani et al. 2022).

Articles 22 and 25 of the Universal Declaration of Human Rights recognize the right to social protection for all, thereby promoting the inclusion of informal workers in social protection programs. The aftermath of Tunisia's revolution confirmed the same. In 2013, government, union, and employer representatives signed a social contract which highlighted social protections as a key

1 Informal employment comprises all workers of the informal sector (unregistered firms) and informal workers outside the informal sector (own-account workers, and employees not contributing to social security, paying income taxes, or who lack certain benefits such as family leave or sick leave).

area of focus, leading to the inclusion of the rights to health and social assistance in Tunisia's 2014 constitution. With the ambition of becoming one of the most comprehensive social security and assistance systems in the Middle East and North Africa region, Tunisia has delivered on this promise to some of its citizens, yet the substantial informal workforce has been left behind in these efforts.

During the past decade, Tunisia achieved progress in terms of legal coverage, almost all socio-professional brackets have experienced significant improvement with this regard. Despite these positive results, effective coverage was low, especially after the 2011 revolution, which was followed by an expansion of the informal economy. A key characteristic of Tunisia's informal economy and informality globally is its heterogeneity: one size of solutions will never fit the entire informal sector, which is composed of workers in myriad sectors and situations.

How, then, can Tunisia extend the benefits of social protection to informal workers? To deal with this question, this paper provides an analysis of the challenges and opportunities for the extension of social protection to informal workers in the Tunisian labor market.

In the first section, we will provide an overview of the social protection system and programs in Tunisia. The second section will discuss the impact of COVID-19 on informal workers and the challenges associated with the pandemic. The third section will provide a brief overview of the main characteristics of the non-covered population. In the section four, we will conduct an econometric analysis. Lastly, we will provide some policy recommendations to enhance social security coverage, through enhancing formality or other possible solutions.

1. Overview of the social protection system and programs in Tunisia

Tunisia has two distinct contributory social insurance funds, both administered by the Ministry of Social Affairs: the National Pension and Social Insurance funds (CNRPS) covering the public sector and the National Social Security Fund (CNSS) covering the private sector (Helmi et al. 2022). CNSS covers a wide range of sectors and offers a number of benefits including pension benefits, death benefits, disability benefits, family benefits, and loans. In 2020, CNRPS covered over 770,000 individuals, and the number of insured persons covered by CNSS reached 2,353,743 (CNSS, 2019).

Tunisia's National Health Insurance Fund (CNAM) was created in 2004 to streamline the country's health insurance systems. CNAM covers employees in the public and private sectors, their spouses, and dependents. As of 2018, CNAM covered more than 8 million beneficiaries, a 32% increase from 10 years prior. (Helmi et al. 2022). Like the social insurance funds, CNAM is contributory and employees contribute different amounts based on their levels of income. CNAM allows covered individuals to choose between public and private healthcare, which comes with

differing levels of costs. Tunisia also provides a number of targeted, non-contributory social protection schemes. These include cash transfer programs such as the National Program of Aid to Needy Families (PNAFN) which comprised 1.9% of total government spending in 2016 (UNICEF 2020), the School Allowance Program (PPAS) for children from low-income households, and recent COVID-19 cash assistance efforts (Marouani et al. 2022). Additionally, Free and Reduced Medical Assistance (AMGI) programs are available at public hospitals for those in need, including all families receiving PNAFN assistance. The Tunisian government also provides in-kind assistance in the form of educational, food, and other goods and services, as well as energy and transportation subsidies for poor and low-income households (World Bank, 2020b)

Because much of Tunisia's existing social protection schemes are tied to employment, the government has worked to establish a National Protection Floor (CRES, 2015) which aims to guarantee access to universal care and a minimum income for all Tunisians. The Amen Social program was created to meet these objectives and is currently in development. The first stage of this program involves identifying and registering eligible Tunisians, a process which has proved difficult, and which we discuss as a key challenge to extending social protection elsewhere in this paper. Once identified, the Amen Social program will target the lower quartile of Tunisian citizens.

2. The impact of the COVID-19 on informal workers and challenges associated with the pandemic

Around the world, COVID-19 disproportionately harmed informal workers. In April 2020 the ILO estimated that 1.6 billion informal workers were significantly impacted by COVID-19, leading to an estimated decline in their earnings of 60% (ILO, 2020). As the pandemic has spread, these numbers have only grown. As many office workers transitioned to remote work, informal workers did not have the option to do so, and were forced into a dilemma of putting their health at risk by working or starving. Furthermore, because informal workers are unregistered by nature, they are the least likely to benefit from government relief efforts, and governments struggled to provide relief even when explicitly targeting informal workers (WIEGO, 2021 and Marouani et al. 2022).

Informal workers in Tunisia have repeatedly faced this reality. As of May 2021 – more than a year after the beginning of the pandemic – cases of the coronavirus reached their highest levels, and businesses in Tunisia continued to grapple with COVID-19 restrictions and faced additional hardships in an already fragile economy. Unlike workers in the public and private sector, Tunisian informal workers found themselves at the margin of the negotiations and efforts to support workers in the context of the pandemic. They were the first category of workers to be affected by the general lockdown measures but lacked a unified voice to claim concrete assistance from the state.

A rapid assessment of women informal workers in Tunisia conducted by the Tunisia Inclusive Labor Institute found that 84% of surveyed workers lost income and 71% fell into debt due to

COVID-19. 47% of those surveyed were forced to work continuously throughout the pandemic despite the associated health risks, while 19% were forced to cease their activities and lose all income due to local lockdown measures. Similarly, just as has been the case globally, Tunisian informal workers struggled to benefit from government relief. Of the over 500 women surveyed across numerous industries in Tunisia, only 18 women reported receiving any sort of aid from the government. The surveyed informal workers were far likelier to receive support from family members or local organizations and associations, though the majority ultimately received no assistance whatsoever despite the Government efforts (TILI, 2021).

3. The main characteristics of the non-covered population

Data presentation

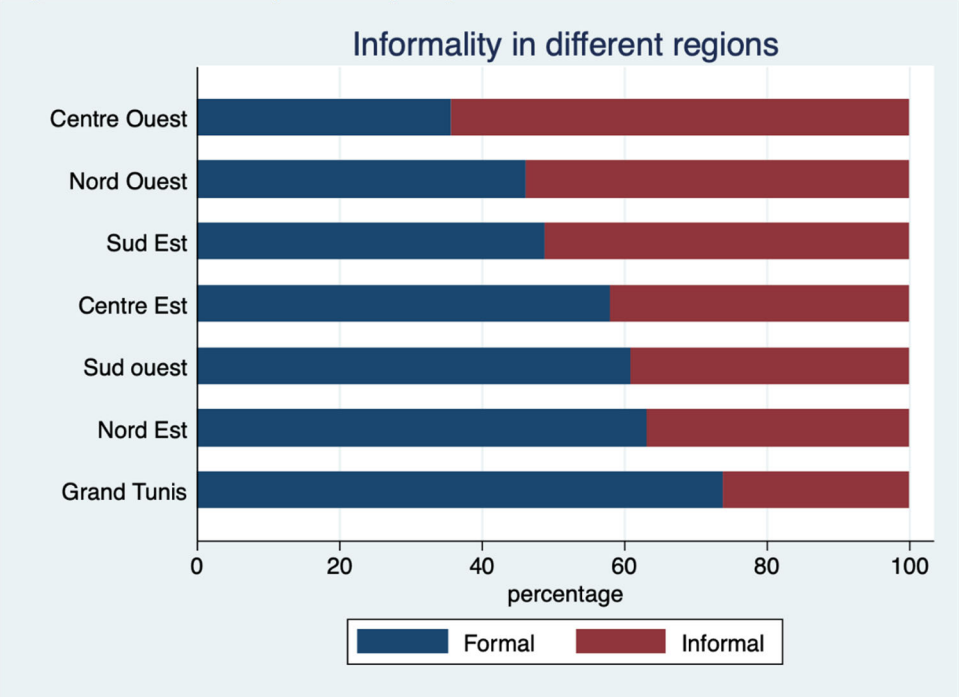
In order to analyze the main characteristics of Tunisia's informal workers we used the "2015 Household Budget, Consumption and Living Standards Survey" (HBCLSS 2015), which is micro-dataset from the survey conducted by the INS in 2015. This survey is the reference survey on household budget and consumption that the INS has been conducting on a five-yearly basis since the mid-1960s.

The survey used for our research would be the tenth in the series and was implemented during the period May 2015 - May 2016 on a total sample of 27,108 households representative of all Tunisian households living in both rural and urban areas. The data collected covers different domains including demographic and socio-economic characteristics, health and social coverage, labour market participation, and housing characteristics.

In order to answer the questions surrounding informality in the Tunisian labour market, we used the raw data from the HBCLSS 2015 to explore and measure the extent of informal employment. As the third module of the survey questionnaire includes questions on the affiliation of economically employed household members to social security schemes, namely the National Pension and Social Insurance funds (CNRPS) covering the public sector and the National Social Security Fund (CNSS) covering a wide range of sectors. In this respect, this paper has adopted a legalistic definition of social protection that suggests classifying as informal all employed or self-employed workers who are not affiliated to a legal social security scheme. In this way, it has been possible to define informality according to the status in the profession (salaried vs. non-salaried), the sector of economic activity, and the place of work (see Appendix B for more details on the dataset and descriptive statistics).

According to the survey, informality is prevalent in Tunisia, 40% of the working population are not affiliated to any social security scheme, and hence are informal[2]. On the other hand, almost 21% are affiliated to CNRPS and 39% to CNSS. Informality varies significantly across different regions in Tunisia, with non-coastal and poor areas being subject to higher rates of informality than others; the overall informality rate in rural areas reaches 58.7% (considering the survey weights) while the same figure in urban areas is 32.7% (Figure 2 details the informality rate across different regions).

Figure 2. Informality rates by region

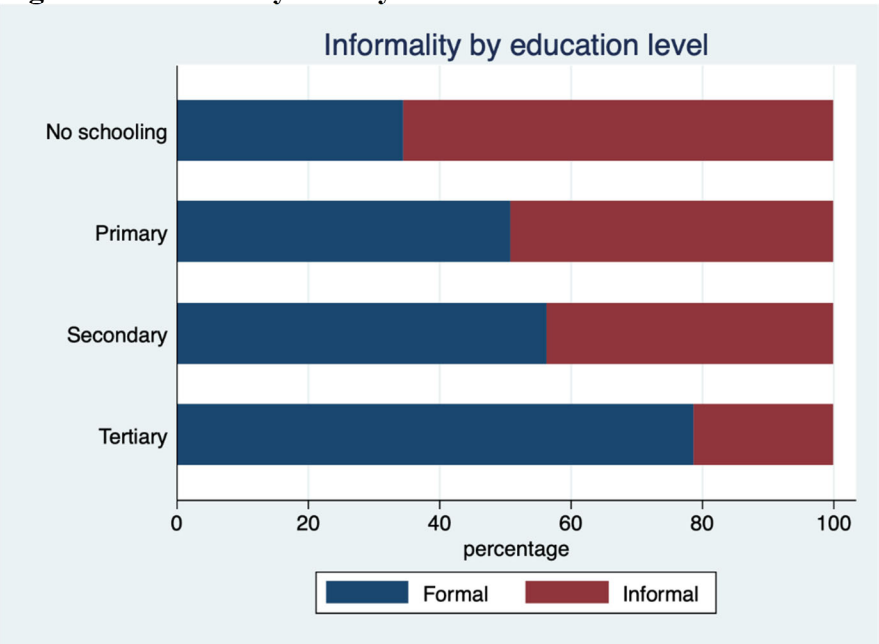


Source: Authors based on HBCLSS 2015

Moreover, informality is affected by educational attainment with individuals achieving higher level of education are subject to lower informality rates (see Figure 3). Some sectors are subject to prodigious informality rates such as agriculture and construction reaching 68.3% and 66.3% of informality respectively. Informality rates by sector of activity is reported in Figure 4.

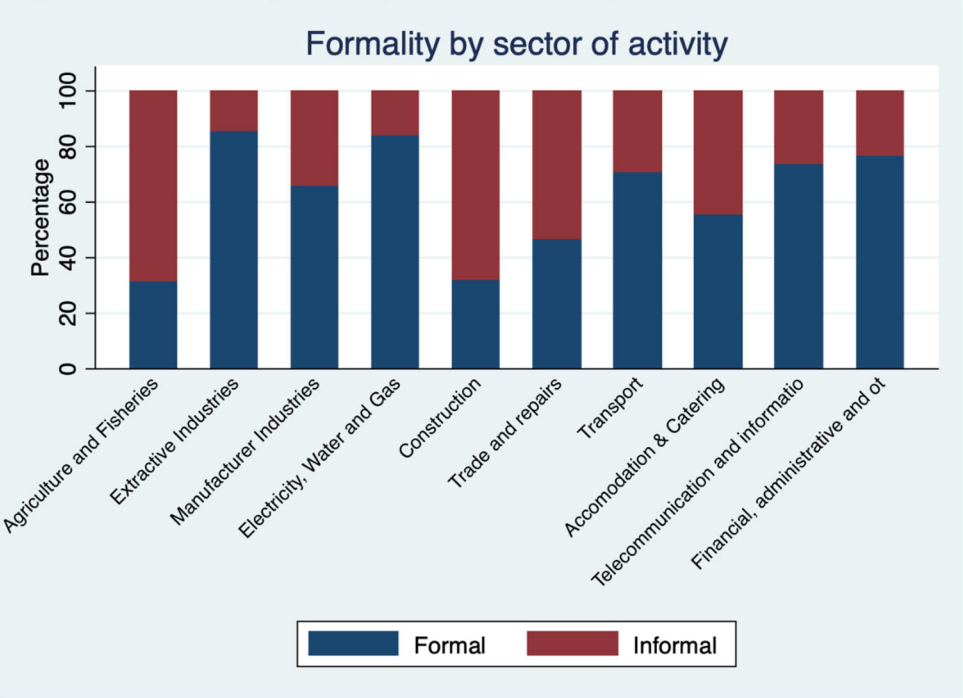
[2] Informality rate reported in the literature varies from one study to another according to the World Bank (2020) it is 45% while according to Ben Cheik and Moisseron (2021) it can be as low as 25.2% of the employed labor force, with 60% of men and 86% of women in informal employment in 2014 being under age 40. In this paper we rely on the 2015 Household Budget, Consumption and Living Standards Survey in which the informality rate is 40%.

Figure 3. Informality rate by educational attainment



Source: Authors based on HBCLSS 2015

Figure 4. Informality rate by sector of activity

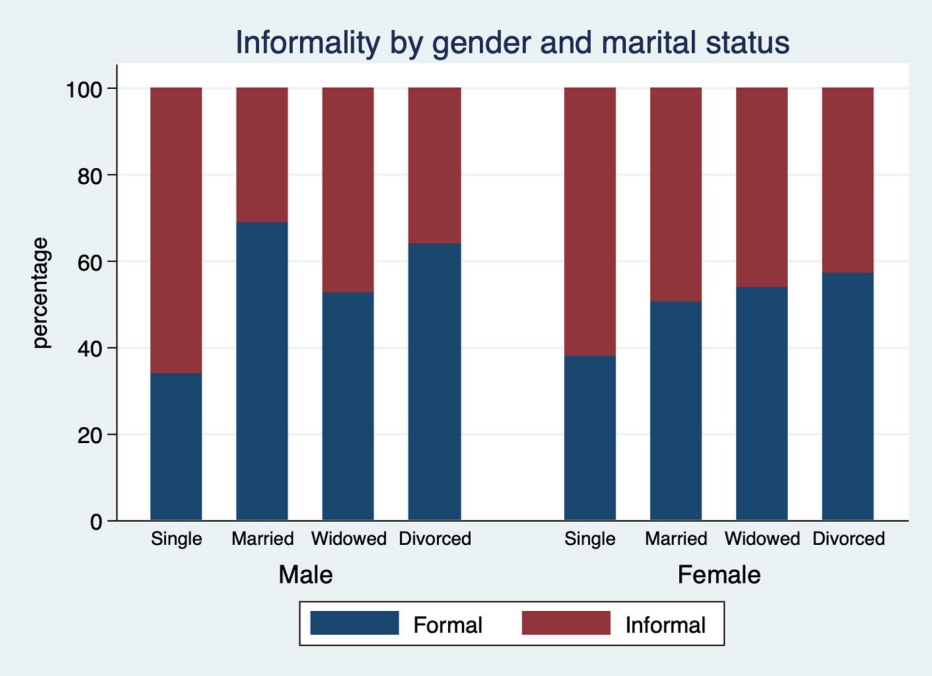


Source: Authors based on HBCLSS 2015

Taking gender into account, the informality rate among women is 45.6% while it reaches 37.9% among men. Marital status also plays a role, and married men are subject to the lowest informality rate (see Figure 5). Informality rates vary across different age groups with younger groups being

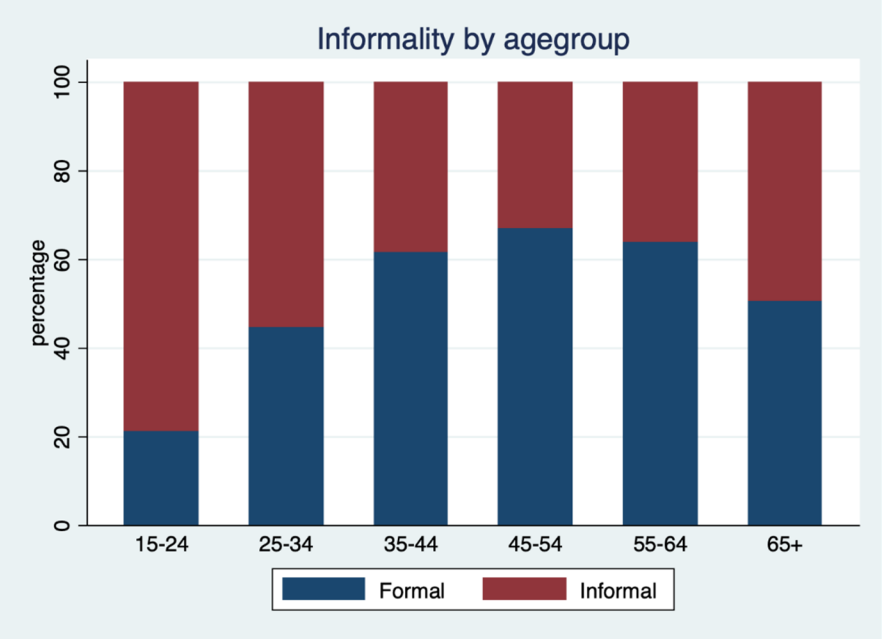
subject to higher rates informality, reaching as high as 75%, but as can be viewed in Figure 6 this relationship does not seem to be linear as the oldest age group is found to be subject to higher informality rates than the age group before them, with the lowest informality rate of 29.2% for the age group of 45 to 54 years.

Figure 5. Informality rate by marital status and gender



Source: Authors based on HBCLSS 2015

Figure 6. Informality rate by age group



Source: Authors based on HBCLSS 2015

4. Econometric analysis

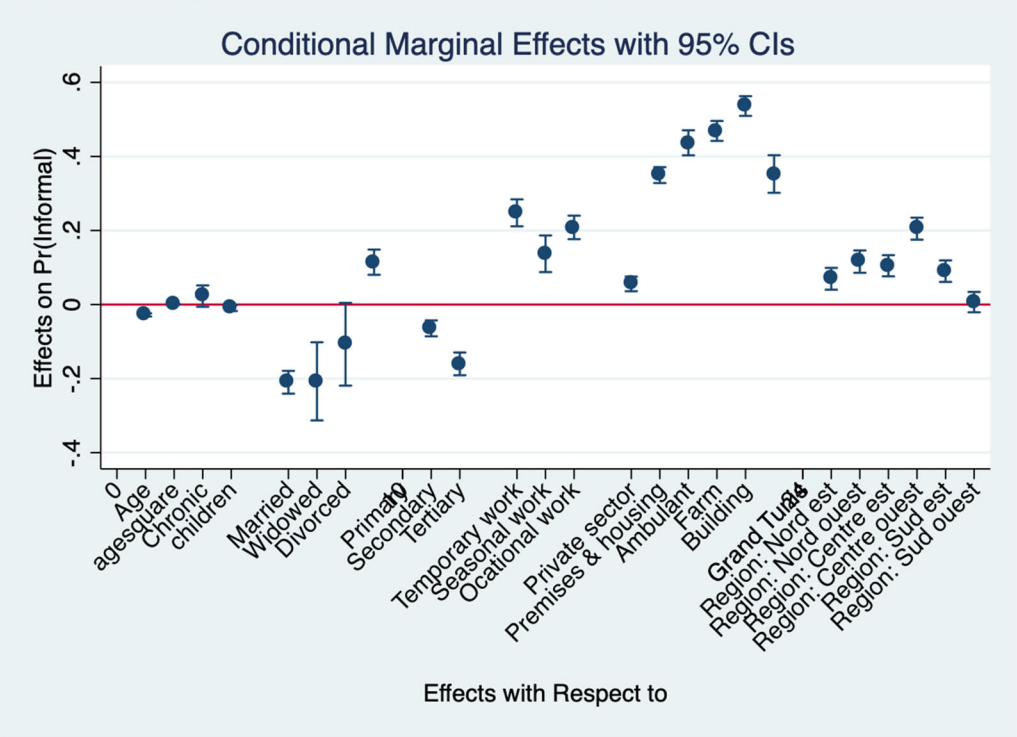
In this section we perform a statistical analysis on the factors affecting informality and the transition to formality. According to the literature, various socioeconomic or job-specific factors may affect informality. Among those are educational attainment, age, marital status, sector of activity (with the agricultural sector having the highest incidence of informal workers), type and duration of contract, employment stability, wage level etc. Regarding the Tunisian context, in their recent work, Ben Cheikh and Moisseron (2021) find that being married, divorced or widowed and aged between 15 and 19 years is more likely to favor informal employment, while a level of educational attainment of at least secondary has a significant negative effect on informality.

We use two datasets, the "2015 Household Budget, Consumption and Living Standards Survey" and the "INS Survey of Population and Employment for the 2nd trimester of 2019" to first assess the main characteristics of informal workers and to identify any differences among men and women. Second, we use the data to identify factors affecting the transition to formality. We use a Probit model and analyze the marginal effects of the underlying factors, then continue with identification of three main categories within the informal workers based on their transition or non-transition to the formal sector. We complete the analysis by identifying the main characteristics of the different categories using a Multinomial Logit model and its marginal effects analysis.

4.1. Econometric specification:

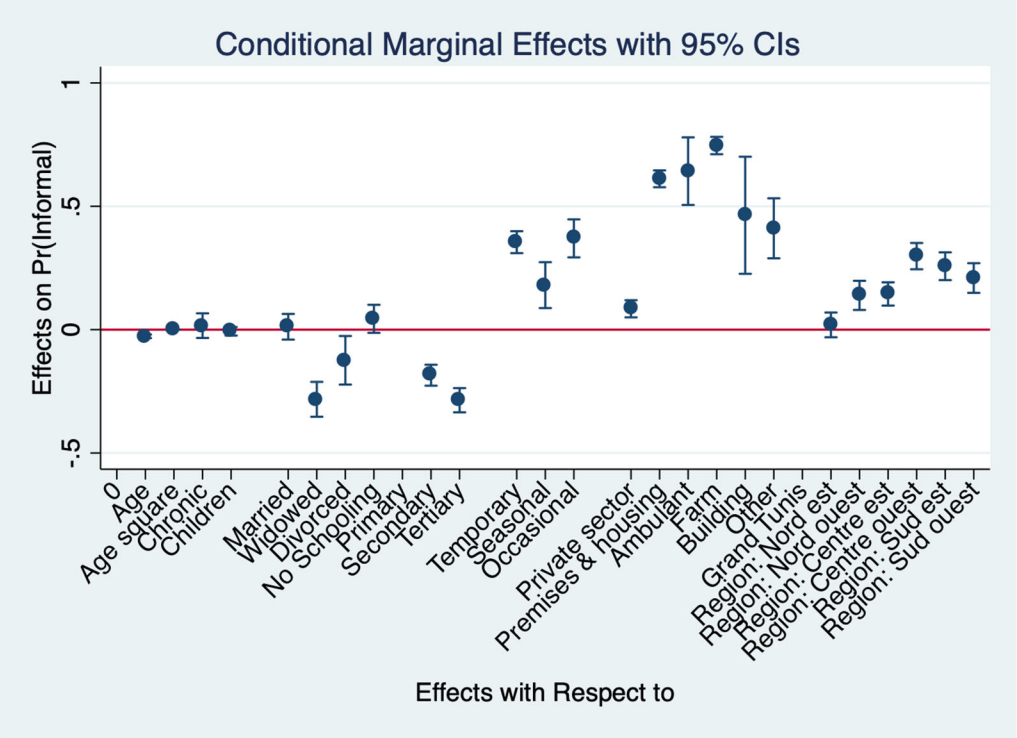
We perform a Probit estimation to identify the main characteristics of the population/workers who are active in the informal sector. Informality is defined as not being affiliated to one of the CNRPS and the CNSS social security schemes. The sample is divided according to the gender of the head of household to identify any differences in characteristics of male and female informal workers (the coefficients of the estimations are reported in Appendix D, Table D1). In order to be able to quantify the impact of each determinant on the probability of being an informal worker, we calculate the marginal effects of the Probit regression. Figures 7 and 8 represent the Marginal effects for both men and women.

Figure 7. Marginal effects of the Probit analysis on the determinants of informality for men



Source: Authors

Figure 8. Marginal effects of the Probit analysis on the determinants of informality for women



Source: Authors

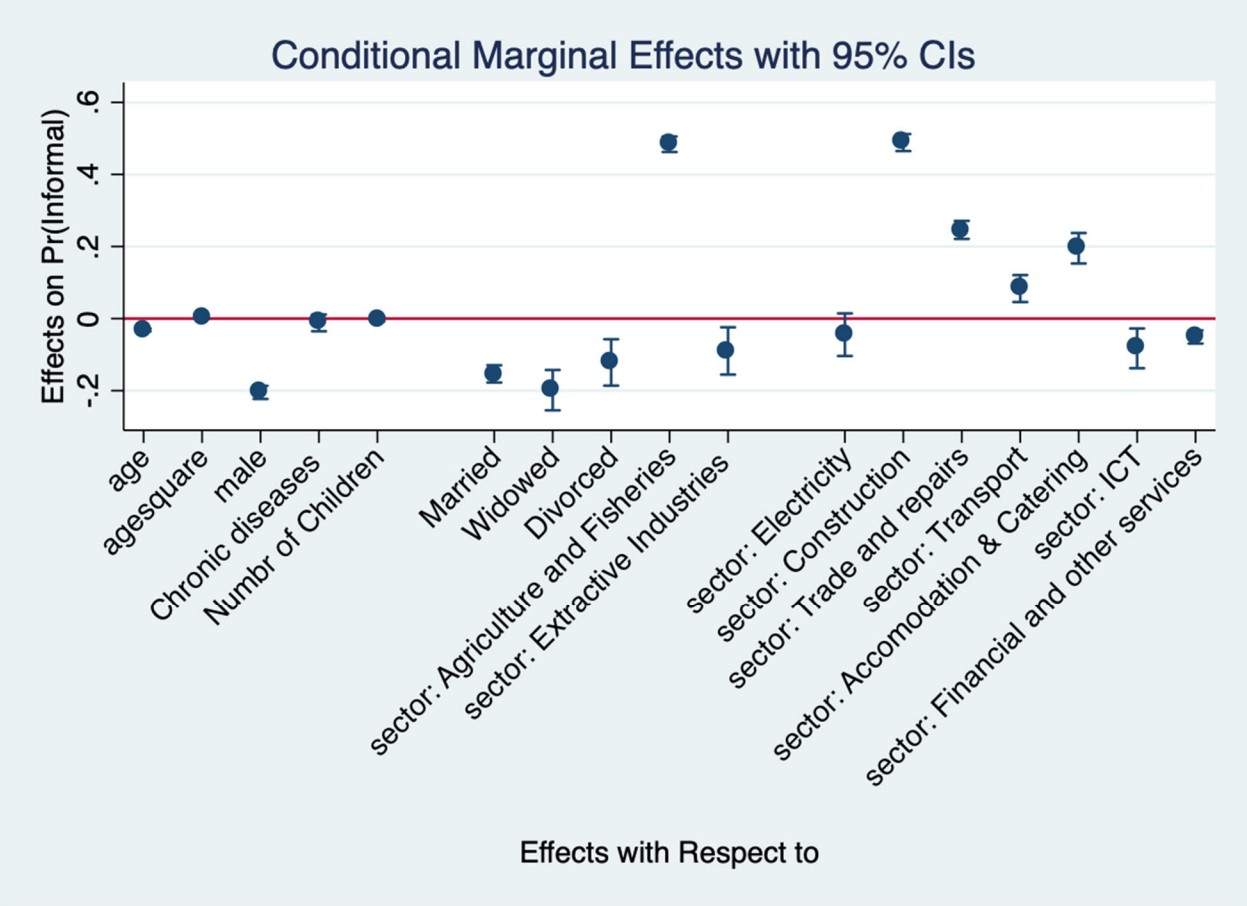
Our results show that the main factors affecting informality are age, type of work, educational attainment, region and workplace. These factors affect both men and women in a similar way. Regarding age, as we expected from the previous analysis, younger individuals are more prone to informality but the relationship is not linear and more of a U-shape with the impact of aging on formality level declining as individuals become older.[3] Globally, people with higher levels of education have a lower tendency to be informal with tertiary education increasing the chances of formality, compared to primary education level, by 16 and 28 percentage points (pp) among men and women, respectively. Although the difference among women with no schooling and primary education is not significant, for men no schooling increases the chances of informality by 11 pp compared to those with primary education. The place of residence also plays an important role in social security coverage with all the regions being subject to higher informality compared to Grand Tunis. In particular, living in the region of Centre Ouest and Sud Est increase the chances of informality by 20 pp (for men), 28 pp (for women) and 9 pp (for men), 25 pp (for women) compared to living in Grand Tunis respectively.

As for marital status, married men are less likely by 21 pp than single men to work informally while the difference between married women and single women is not significant. Both widowed men (by 20 pp) and women (by 28 pp) are less likely to be informal compared to their single counterparts.

Because sector of activity is another important determinant of informality in Tunisia, we ran another Probit estimation excluding all the other factors affected by the sector of activity (to avoid multicollinearity). The results are reported in detail in Appendix F and the marginal effects are presented in Figure 9, indicating that working in the *agriculture* or *construction* sectors increased the chances of being informal by 48 pp compared to working in the manufacturing sector. In the *trade and repairs* and *accommodation and catering* sectors there is higher chances of being informal by 24 and 19 pp, respectively. On the contrary, working in the *extractive industries* and *telecommunications and information* sector decreases the chances of informality by 9 and 7.9 pp respectively compared to the manufacturing industries. This estimation also reveals that women tend to have 20 pp higher chances to be informal compared to men.

[3] Hence an increase of 1 year of age increases the chances of formality more considerably for younger individuals, whereas for older individuals the impact of another year of age is very small (the first derivative is negative, but the second derivative is positive).

Figure 9. Marginal effects of the Probit analysis on the determinants of informality for sector of activity



Source: Authors

4.2. Factors affecting the transition to formality

Dataset presentation

In order to assess factors affecting the transition to formality, we used the *Institut National de la Statistique* (INS) statistical survey of population and employment for the 2nd trimester of 2019 (INS2019 dataset). The data was collected by INS as an extension to the household survey, using the initial 195,000 households as the basis for drawing a sample of informal workers who are employed employees, self-employed persons or providers of family aid. The sample design for this survey is a two-stage stratified random draw. First, a set of census districts is drawn by governorate and area, and then 27 households are randomly drawn from each district. All members of the sampled households are interviewed. This survey includes 10,911 observations and since it targets specifically informal workers within the household survey, it allows us to identify the main characteristics of those informal workers who may or may not have transitioned to formality. The description of the variables and summary statistics are reported in Appendix C.

In this section, we first analyze the characteristics of workers who have transitioned to formality using a Probit estimation. Second, after classifying the sample into 3 groups based on whether they have transitioned to formality or not, we identify factors affecting belonging to one of these specific categories using a Multinomial-Logit model.

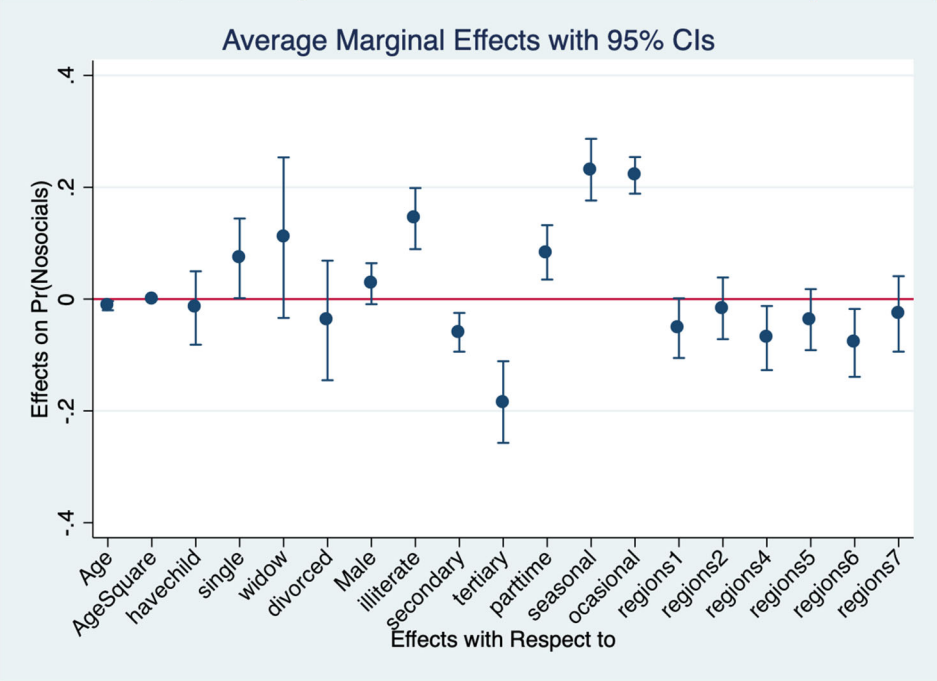
In order to assess informality (here defined as not being affiliated to a Tunisian social security scheme), we use the following two different proxies:

- Variable "socials", a dummy variable indicating whether the surveyed individual declared being affiliated to a social security scheme, public or private (this proxy is similar to the adopted definition for informality in the previous section).
- Variable "formal", a dummy variable based on the response to the question: "Are you formally declared by your employer?"

Once these variables are equal to 1, it indicates that the surveyed individual has transitioned to the formal sector.

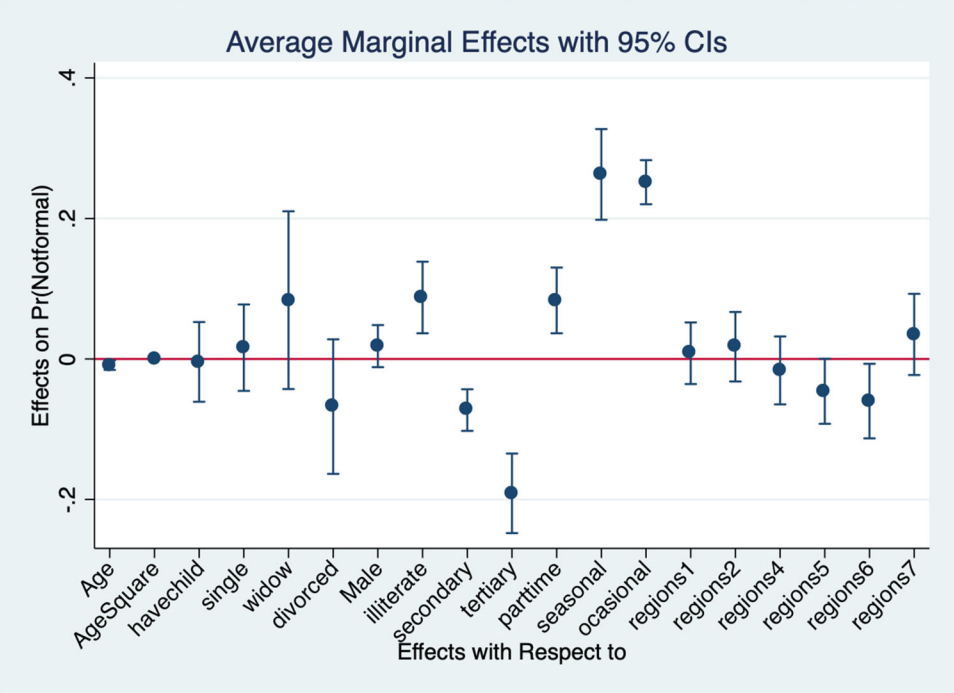
Hence in a first stage, we perform a Probit estimate to identify the main characteristics of the individuals who have transitioned to formality. A number of socio-economic characteristics such as age, gender, marital status, education level, type of work and region are tested and the results of the analysis are reported in Appendix G in detail. Figures 10 and 11 represent the marginal effects of the Probit estimation for the 2 proxies of informality.

Figure 10. Marginal effects of the Probit analysis on the determinants of not transitioning to formality (declaring not to be affiliated to a social security scheme)



Source: Authors

Figure 11. Marginal effects of the Probit analysis on the determinants of not transitioning to formality (Not formally declared by the respondent's employer)



Source: Authors

The results of this estimation are consistent with the findings of the previous results and indicate a positive impact of being illiterate on remaining informal (compared to having primary education) and a negative impact of secondary and tertiary education in remaining informal. Furthermore, according to the marginal effect analysis, this effect can be as high as 18% higher chances of formalizing for those with tertiary education (compared to primary education). Additionally, working part time, occasional or seasonal increases the chances of not formalizing. Although wage level can be a determinant for formality, we did not include it in the estimation as it would have created endogeneity and multicollinearity issues as it is certainly affected by education level and type of work. However, the analysis reported in Appendix H shows that the workers earning less than the legal minimum wage in Tunisia (SMIG) have 16% higher chances of not transitioning to the formal sector.

4.3. Multinomial logit Analysis: factors determining transition to formality

Within the INS survey of population and employment for the 2nd trimester of 2019, the interviewees are requested to provide an answer to the following questions:

- Q1: If you are not declared by your current employer, have you been affiliated before: as an independent, employee or not affiliated
- Q2: Are you declared by your current employer to the social security fund?

These questions provide information regarding the previous status of the workers and allows us to identify 3 categories of individuals:

1. Those who have transitioned to formal, (informal-formal): not concerned by Q1 and report "yes" to Q2
2. Repeatedly changing status (informal-formal-informal): reply "no" to Q2 and either of the first 2 answers to Q1
3. Remaining informal (informal-informal) (biggest share in the sample): reply "no" to Q2 and "not affiliated" to Q1

Given the fact that this survey focuses on informal workers, we can say that the first category is comprised of workers who have transitioned from informal to formal. Workers in the second category are those who transition often (informal to formal and informal again) and those in the third category have remained in the informal sector (informal-informal).

We use the following Multinomial Logit model to identify the probability of individuals belonging to a specific category and to identify the main characteristics of each of these categories in order to better understand transition to formality among Tunisian informal workers.

The coefficients within the Multinomial Logit are reported in Appendix I and the marginal effects are presented in Table 1, indicating the probability of belonging to a specific category, everything being equal. The main factors affecting the transition to formality is having a precarious job (part time, seasonal and occasional work). For workers occupying a seasonal or occasional jobs, the chances of moving to the formal sector (or belonging to the first category) is reduced by 26 pp, while being a part-time worker reduces the chance by 8 pp. Moreover, these precarious workers have a higher probability to not transition and remain informal (or belong to the third category).

Furthermore, marital status and having children do not impact significantly belonging to a specific transition category. Another relevant factor affecting the transition to formality is educational level. Having secondary and tertiary education level is associated with respectively 7 and 18 pp higher chances to move to formal sector (Being in the first category) compared to primary education. On the other hand, being illiterate has a strong impact for remaining informal workers.

Table 1. Marginal effect analysis for the Multinomial Logit regression for the 3 transition categories

categories	(1)	(2)	(3)
description of categories	Those who transitioned to formal sector	those who transitioned but came back to informality	informal workers who did not transition
AgeSquare	-0.0000605	-0.0000679	0.000128*
	(-1.33)	(-1.86)	(2.45)
Age	0.00816*	0.00598	-0.0141***
	(2.25)	(1.92)	(-3.33)
urban	0.0333*	0.0158	-0.0491**
	(2.25)	(1.48)	(-3.00)
Have child	0.0149	0.0211	-0.0361
	(0.48)	(0.88)	(-1.00)
single	-0.00599	-0.0300	0.0359
	(-0.18)	(-1.14)	(0.90)
widow	-0.0958	-0.0859	0.182*
	(-1.39)	(-1.49)	(2.21)
divorced	0.0676	-0.0487	-0.0189
	(1.37)	(-0.83)	(-0.31)
Male	-0.0170	0.0237	-0.00667
	(-1.14)	(1.93)	(-0.38)
illiterate	-0.0942**	-0.0456*	0.140***
	(-3.17)	(-2.42)	(4.48)
secondary	0.0746***	0.0191	-0.0937***
	(4.89)	(1.56)	(-5.23)
tertiary	0.180***	-0.0398	-0.141***
	(6.25)	(-1.51)	(-3.99)
parttime	-0.0812**	-0.0181	0.0993***
	(-2.88)	(-1.10)	(3.46)
seasonal	-0.266***	0.0469**	0.219***
	(-6.35)	(2.58)	(5.59)
occasional	-0.259***	0.0137	0.245***
	(-14.74)	(1.33)	(13.84)
N	5795	5795	5795
t statistics in parentheses			
* p < 0.05, ** p < 0.01, *** p < 0.001			

Source: Authors

In sum, these results indicate that higher educated individuals are more likely to transition to formality. Moreover, having an unstable job that can be part time, seasonal or occasional, and being illiterate hinders the transition towards formality. This analysis hence confirms the previous results that higher levels of education and having a permanent job increase the chances of transitioning to the formal sector.

Conclusion and policy recommendation

Extending a social insurance system to informal workers is a major challenge, in terms of regulations, financing, registration of participants, creating incentives to contribute, and not increasing labor market distortions.

Informality is prevalent in Tunisia with around 40% of jobs being informal. The results of our analysis highlight that people with lower level of education level are most likely to occupy informal jobs on a long-term basis. Another important factor affecting workers is the job status, those holding precarious jobs such as occasional/seasonal/part-time jobs are subject to informality and have higher chances not to transition to the formal sector. Men are more prone to have an informal job. Although married men are more likely to be formal compared to single men, the difference between married women and single women is not significative. Some sectors are more prone to informality such as agriculture and fisheries and construction which are subject to high informality compared to manufacturing.

For the informal self-entrepreneurs, the recent law on the self-entrepreneur comes as a solution. The new law creates a streamlined formalization process that eliminates many of the barriers workers previously faced. Similar systems have proven effective in achieving the transition from the informal sector/economy to the formal one in more than one country that has adopted it, including the United States of America, Canada, Senegal, France and Morocco. These last two experiences offer successful models to extend especially social protection to informal workers.

The extension of social security to the informal workers is quite challenging, in many sectors informal economy is the dominant mode of economic organization (Plagerson et al., 2022). Barriers do vary from lack of trust to inappropriate legislation, lack of information and awareness, high cost and inadequate financing, burdensome administrative procedure, lack of enforcement and policy coherence (ILO, 2021). The tools to encourage formalization vary from taxation, regulation and creating incentives through creation of new schemes. Based on our results and analysis several options could be adopted to extend social protection programs in Tunisia:

- We have seen that around 40% of Tunisia's workforce is informal, and because social protection schemes are tied to employment, a majority of these workers and their families are excluded from coverage. Dissociating access to social insurance programs from employment

contracts would allow access to the social insurance program for all workers regardless of their employment status or sector of activity.

- The combination of contributory and non-contributory schemes in order to facilitate the formalization of workers and enterprises.
- The implementation of a safety net is the most effective approach, and should be considered to cover the most vulnerable groups: illiterate workers and workers with an occasional/seasonal/part-time job.
- Development of a social schemes specific to sectors where informality is prevalent such as agriculture and fisheries, construction.
- Exploiting the opportunities offered by new technologies to extend social protection coverage to those excluded, to reduce management and administration costs, and to facilitate access to benefits and services through better identification of beneficiaries. Many countries have put in place a digital identification policy. This policy allows targeting all citizens including both formal and informal workers. In addition to facilitating service delivery, digital identification systems have reduced leakage in the delivery of social protection programs and duplicate applications, as well as corruption (World Bank, 2017).
- Setting up micro-insurance for pensions, for health, or setting up ad-hoc services in social protection organizations.
- Supporting partnerships with key stakeholders within the civil society (ie: the Informal Sector Groups) to inform and support informal workers to save and contribute to social security programs.
- Supporting dialogue and participatory processes that balance the economic effects and social objectives of national social security systems.

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Appendices

A. Examples of the extension of social protection schemes

Extending a social insurance system to informal workers is a major challenge, in terms of regulations, financing, registration of participants, incentives to contribute, and not increasing labor market distortions. Social pensions or non-contributory health insurance are effective mechanisms to reach out to workers who are outside the mandatory contributory systems. Some countries have introduced universal coverage and non-contributory social insurance programs to expand coverage to the whole population. Universal coverage not based on contributions and funded through general taxation has been developed in Ghana, Rwanda, Cape Verde, Mauritius, and Thailand. Insurance schemes on a voluntary basis have also been developed in many countries for informal workers and in partnership with the informal sector, as in the case of Philippines.

To respond to the impossibility for informal workers to contribute regularly to the social security system due to the seasonal and irregular nature of their income, the Philippines Social Security System has implemented specific schemes in partnership with a key stakeholder – the Informal Sector Groups (ISGs) that has helped the administration and logistics of the AlkanSSSya programme. The AlkanSSSya Schemes is dedicated to the self-employed where cooperatives and municipalities collect contributions from insured persons. Through this programme, workers in the informal sector were able to contribute PhP 11/day (USD$ 0.24) which is affordable for the majority of households. This programme contributes to formalization by making it possible for informal workers to register with the system. Furthermore, it helped to create a culture of contribution to social schemes (V. Damerau, 2015).

Argentina introduced a universal child benefit (*Asignacion Universal por Higo*, AUH) targeted at informal workers. However, because child benefits for formal workers are lower than the AUH, it could be expected that poor households with children could be discouraged from entering the formal labor market. Some authors analyzed changes in labor supply following the implementation of AUH and found that the AUH reduced the transition from informal to formal jobs but that there was no significant change for formal workers with children to quit the formal sector (Garganta and Gaparani, 2015).

B. Dataset Descriptions - 2015 Household Budget, Consumption and Living Standards Survey

Table B1. Description of the variables used within the 2015 Household Budget, Consumption and Living Standards Survey

Variable	Variable Description	Number of Observations	Mean	Std. Dev	Min	Max
informal	Not affiliated to CNRPS nor CNSS	29391	0.4479603	0.497293	0	1
age	Age	104992	33.19296	21.86159	0	105
agesquare	Age square	104992	1579.697	1719.443	0	11025
sexe	Gender	104982	1.509583	0.4999105	1	2
chronic	Chronic Disease	104981	0.8568122	0.3502659	0	1
child_hh	Number of Children per Household	104992	1.331454	1.386021	0	10
marital	Marital status	104976	1.530064	0.6239876	1	4
edu	Education level (no schooling, primary, …)	100501	2.279957	0.9415406	1	4
twork	Type of work (permanent, temporary, …)	43245	1.682507	1.081145	1	4
wplace	Work place (public, private, farm, …)	43702	3.254588	1.841761	1	7
region	Region	104992	4.244495	2.011567	1	7

Source: Authors using 2015 Household Budget, Consumption and Living Standards Survey

Here are some interesting informality rates based of the socio-economic categories such as gender, sector of activity, etc.

Table B2. Informality rate by gender

	Male	Female	Total
Formal	62.08	54.33	59.78
Informal	37.92	45.67	40.22
Total	100	100	100

Source: Authors using 2015 Household Budget, Consumption and Living Standards Survey
Note: Survey weight are taken into account

Table B3. Informality rate by sector of activity

Sector of activity	Formal	Informal	Total
Agriculture and Fisheries	31.7	68.3	100
Extractive Industries	87.52	12.48	100
Manufacturer Industries	68.49	31.51	100
Electricity	83.87	16.13	100
Construction	33.66	66.34	100
Trade and repairs	52.44	47.56	100
Transport	74.33	25.67	100
Accommodation & Catering	57.26	42.74	100
Telecommunication and information	76.86	23.14	100
Financial, administrative and other services	78.9	21.1	100
Total	59.78	40.22	100

Source: Authors using 2015 Household Budget, Consumption and Living Standards Survey
Note: Survey weight are taken into account

Table B4. Informality rate by place of residence

	rural	urban	Total
Formal	41.32	67.27	59.78
Informal	58.68	32.73	40.22
Total	100	100	100

Source: Authors using 2015 Household Budget, Consumption and Living Standards Survey
Note: Survey weight are taken into account

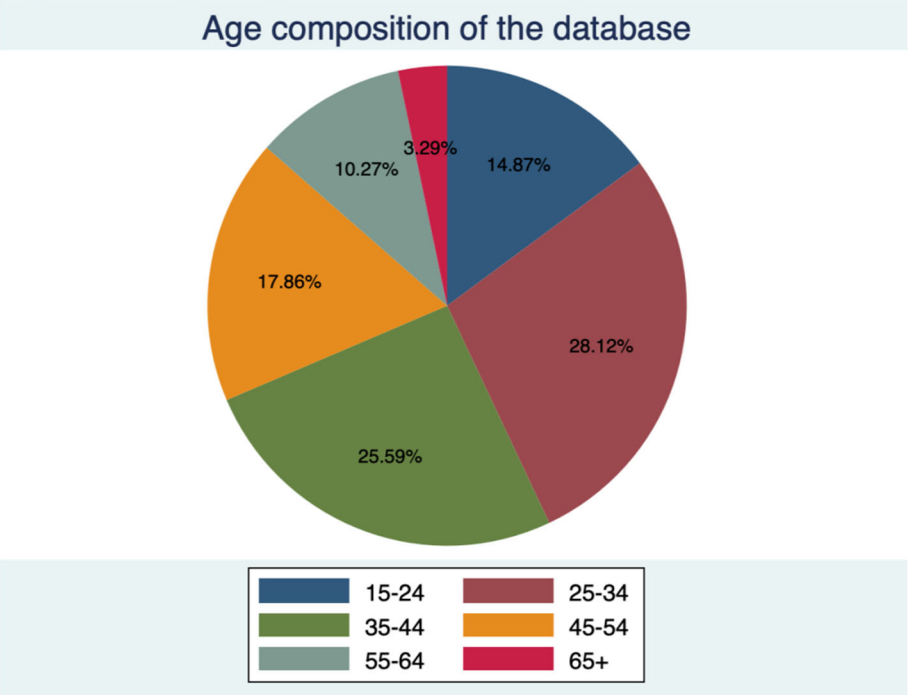
C. Dataset Descriptions - INS survey of population and employment for the 2nd trimester of 2019

Table C1. Description of the variables in INS2019

Variable name	Variable Description	Number of Observations	Mean	Std. Dev	Min	Max
young	aged bellow 25	10,911	0.148749	0.3558572	0	1
old	aged above 60	10,911	0.0578315	0.2334353	0	1
urban	living in an urban area	10,911	0.4959215	0.5000063	0	1
havechild	having a child	10,911	0.5468793	0.4978203	0	1
single	being single	10,892	0.3966214	0.4892186	0	1
widow	being a widow	10,892	0.0198311	0.1394259	0	1
divorced	being divorced	10,892	0.0145979	0.119942	0	1
Male	being a man	10,911	0.665017	0.4720062	0	1
illiterate	being illiterate	10,911	0.1298689	0.3361746	0	1
secondary	having secondary level of education	10,911	0.3494638	0.4768225	0	1
tertiary	having tertiary level of education	10,911	0.0769865	0.2665823	0	1
parttime	working part time	5,857	0.1516135	0.3586764	0	1
seasonal	having a seasonal job contract	5,843	0.1102174	0.3131873	0	1
occasional	having an occasional job contract	5,843	0.397912	0.489509	0	1
Age	Age	10,911	38.63752	13.20323	15	88
socials	being affiliated to a social security scheme	8,622	0.2811413	0.4495824	0	1
formal	being formally declared by the employer	5,871	0.1781639	0.3826832	0	1

Source: Authors using INS2019

Figure C1. Age composition of INS, Survey informal workers, 2019



Source: Authors

50.4% of the respondents live in rural areas and the remaining 49.6% live in urban areas.

22.2% of the sample confirm being affiliated to one of the 2 main social security plans in Tunisia (CNRPS and CNSS), 56.8% declare not having a social security plan, 18% are not concerned by the question (unemployed), and the remaining 2.9% have other plans. Men have slightly a higher percentage of being affiliated to a social security scheme with 29% of them being affiliated as this figure is 25% for women.

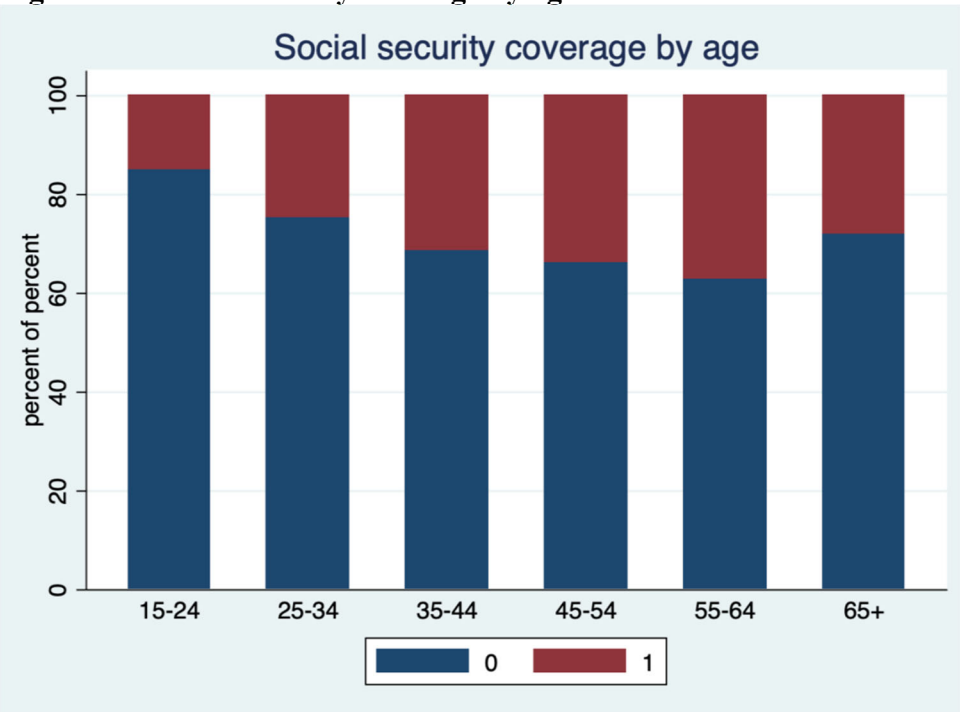
Table C2. Percentage of having social security by gender

having a Social security	Female	Male	Total
0	1,922	4,276	6,198
	74.87%	70.62%	71.89%
1	645	1,779	2,424
	25.13%	29.38%	28.11%
Total	2,567	6,055	8,622
	100%	100%	100%

Source: Authors using INS2019

Being in the working age population, not surprisingly, increases the chances of being affiliated.

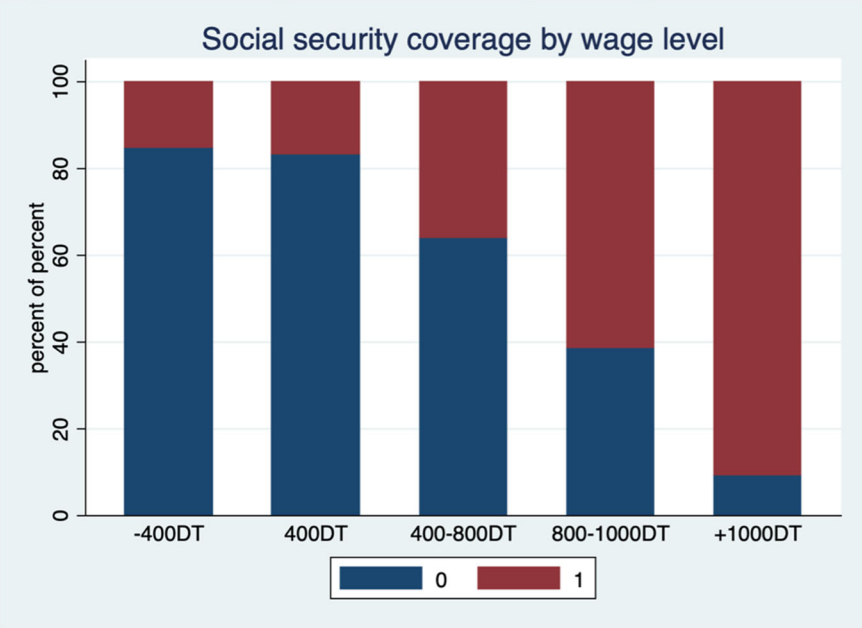
Figure C2. Social security coverage by age



Source: Authors

The higher the wage, the higher the chances of being affiliated to a social security scheme:

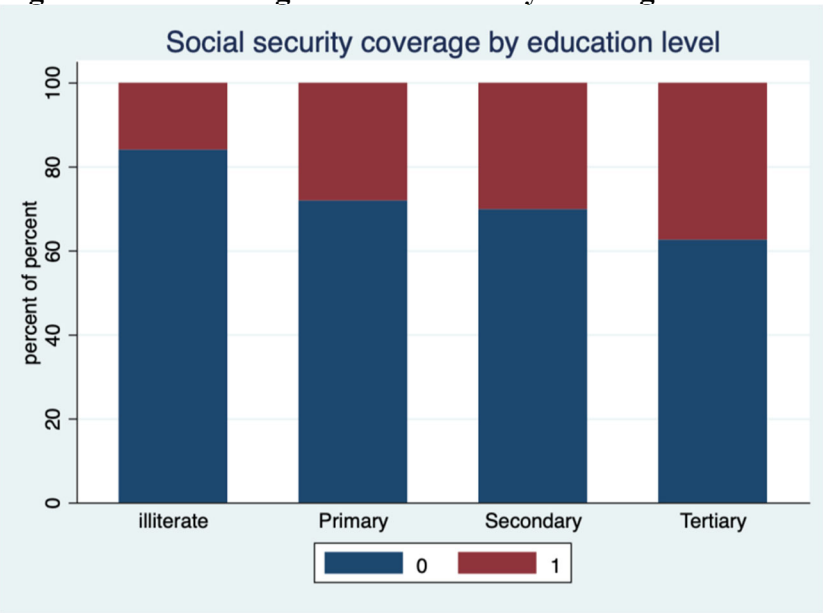
Figure C3. Percentage of social security coverage for different wage groups



Source: Authors

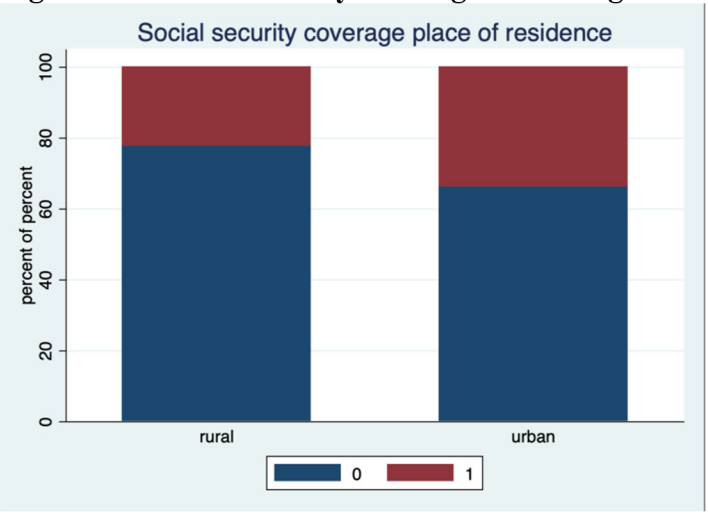
Higher education levels are also associated with higher proportion of affiliation to a social security scheme.

Figure C4. Percentage of social security coverage for different education levels



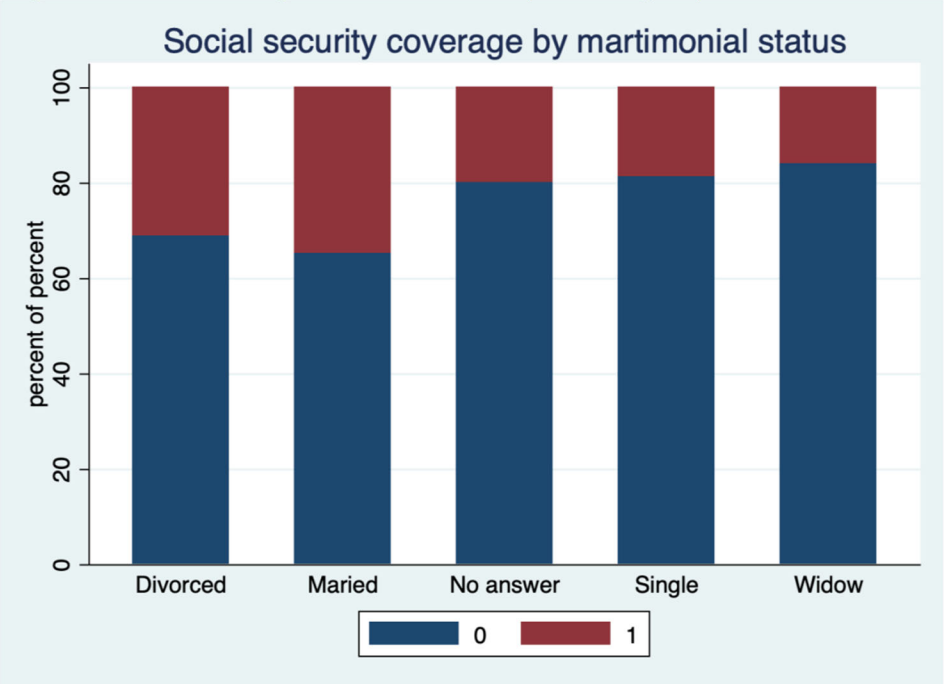
Source: Authors

Figure C5. Social security coverage according to urban or rural place of residence



Source: Authors

Figure C6. Percentage of social security coverage by different matrimonial status



Source: Authors

Table C3. Correlation table among variables of interest

	young	old	urban	havechild	single	widow	divorced	Male	illiterate	secondary	tertiary	parttime	seasonal	ocasional	Age	socials	formal
young	1																
old	-0.079	1															
urban	-0.058	-0.0234	1														
havechild	-0.427	0.1422	0.015	1													
single	0.4666	-0.1485	-0.021	-0.8958	1												
widow	-0.052	0.0958	0.035	0.1013	-0.11	1											
divorced	-0.053	-0.0206	0.048	0.0467	-0.117	-0.0146	1										
Male	0.0341	-0.0177	-0.069	0.0024	0.008	-0.1311	-0.0977	1									
illiterate	-0.144	0.1865	-0.134	0.2057	-0.217	0.1314	0.0165	-0.171	1								
secondary	0.1729	-0.1073	0.118	-0.2312	0.237	-0.0651	-0.0268	0.0915	-0.2626	1							
tertiary	-0.064	-0.0464	0.168	-0.1312	0.123	-0.0247	0.0035	-0.233	-0.1072	-0.228	1						
parttime	-0.049	0.0641	-0.087	0.026	-0.023	0.0112	0.0085	-0.045	0.047	-0.028	0.0164	1					
seasonal	0.0122	0.044	-0.199	0.0116	-0.012	0.0298	-0.0052	-0.077	0.1511	-0.102	-0.072	0.0466	1				
ocasional	-0.027	0.0086	-0.075	-0.0023	-0.002	-0.0053	-0.011	0.0986	0.0113	-0.03	0.0072	0.1264	-0.283	1			
Age	-0.605	0.3989	0.015	0.616	-0.644	0.1335	0.0655	-0.012	0.3528	-0.292	-0.124	0.0721	0.0362	0.0054	1		
socials	-0.102	-0.0031	0.14	0.1269	-0.141	-0.0248	0.0218	-0.008	-0.0987	0.0345	0.083	-0.1134	-0.11	-0.2313	0.097	1	
formal	-0.055	-0.0346	0.157	0.0586	-0.064	-0.0192	0.0277	-0.049	-0.096	0.0545	0.1273	-0.1177	-0.135	-0.2665	0.031	0.761	1

Source: Authors

D. Econometric estimations for determinants of informality

In this appendix we report the results of the Probit analysis. The first estimation is carried out on the 2015 Household Budget, Consumption and Living Standards Survey dataset to determine the characteristics of the informal workers:

Table D1. Probit analysis, comparison of the main characteristics of the informal workers between men and women

	Head of Household is Male		Head of household is Female	
	Probit Model y: being informal	Marginal effects	Probit Model y: informal	Marginal effects
Age	-0.0782***	-0.0280***	-0.0680***	-0.0269***
	(-12.91)	(-12.88)	(-6.95)	(-6.95)
Agesquare	0.000638***	0.000229***	0.000516***	0.000204***
	(10.11)	(10.08)	(4.85)	(4.85)
Chronic diseases	0.0635	0.0228	0.0408	0.0162
	(1.55)	(1.55)	(0.63)	(0.63)
Numbr of Children	-0.0265*	-0.00948*	-0.0166	-0.00659
	(-2.30)	(-2.30)	(-0.75)	(-0.75)
Marital Status				
Single (ref)	0	0	0	0
	(.)	(.)	(.)	(.)
Married	-0.565***	-0.210***	0.0295	0.0117
	(-13.57)	(-13.38)	(0.44)	(0.44)
Widowed	-0.558***	-0.207***	-0.816***	-0.282***
	(-3.44)	(-3.85)	(-6.80)	(-7.83)
Divorced	-0.275	-0.107	-0.322*	-0.124*
	(-1.82)	(-1.88)	(-2.39)	(-2.47)
Education level				
No schooling	0.293***	0.114***	0.114	0.0439
	(6.67)	(6.58)	(1.50)	(1.51)

Primary (ref)	0	0	0	0
	(.)	(.)	(.)	(.)
Secondary	-0.178***	-0.0644***	-0.467***	-0.185***
	(-5.88)	(-5.89)	(-8.37)	(-8.52)
Tertiary	-0.480***	-0.160***	-0.741***	-0.286***
	(-9.29)	(-10.22)	(-10.84)	(-11.41)
Type of work				
Permanent (ref)	0	0	0	0
	(.)	(.)	(.)	(.)
Temporary	0.651***	0.248***	0.932***	0.355***
	(13.77)	(13.34)	(13.79)	(15.63)
Seasonal	0.373***	0.137***	0.458***	0.180***
	(5.75)	(5.43)	(3.80)	(3.80)
Occasional	0.553***	0.208***	0.979***	0.370***
	(13.45)	(12.88)	(8.01)	(9.43)
Work place				
Public sector (ref)	0	0	0	0
	(.)	(.)	(.)	(.)
Private firms	0.293***	0.0557***	0.304***	0.0846***
	(5.74)	(5.53)	(4.69)	(4.77)
Private premises and housing	1.203***	0.350***	1.740***	0.612***
	(28.76)	(31.96)	(27.14)	(35.09)
Ambulant	1.422***	0.437***	1.846***	0.642***
	(26.37)	(25.29)	(7.34)	(9.19)
Farm	1.503***	0.469***	2.310***	0.746***
	(31.73)	(34.05)	(24.56)	(41.54)
Building Site	1.676***	0.536***	1.312***	0.464***
	(34.60)	(39.48)	(4.09)	(3.83)
Region				

Grand Tunis (ref)	0	0	0	0
	(.)	(.)	(.)	(.)
Nord Est	0.208***	0.0695***	0.0518	0.0193
	(4.63)	(4.63)	(0.75)	(0.75)
Nord Ouest	0.335***	0.116***	0.359***	0.139***
	(7.49)	(7.51)	(4.62)	(4.62)
Centre Est	0.305***	0.105***	0.374***	0.145***
	(7.13)	(7.19)	(5.97)	(6.03)
Centre Ouest	0.565***	0.205***	0.766***	0.298***
	(13.18)	(13.53)	(10.46)	(10.97)
Sud Est	0.265***	0.0902***	0.658***	0.257***
	(6.07)	(6.09)	(8.70)	(8.95)
Sud Ouest	0.0207	0.00655	0.536***	0.209***
	(0.47)	(0.47)	(6.76)	(6.82)
_cons	0.783***		0.648*	
	(4.78)		(2.44)	
N	21241	21241	7968	7968

t statistics in parentheses

* p < 0.05, ** p < 0.01, *** p < 0.001

Source: Authors

F. Robustness checks on determinants of formality

Sector of activity is another important determinant of informality in Tunisia. In this Appendix we present a robustness analysis to determine the factors affecting the probability of being informal using the 2015 Household Budget, Consumption and Living Standards Survey and with a focus on sector of activity. Since the sector of activity is strongly correlated with the work place, type of work, education level and even the region, we do not include these factors in the Probit estimation to avoid multicollinearity.

Table F1. Probit analysis, of the informality based on the sector of activity

	Probit Model y: being informal	Marginal effects
age	-0.0826*** (-15.94)	-0.0316*** (-15.92)
Age square	0.000748*** (13.23)	0.000286*** (13.21)
Male	-0.536*** (-22.01)	-0.205*** (-22.04)
Chronic diseases	-0.0313 (-1.01)	-0.0120 (-1.01)
Number of Children	-0.00256 (-0.28)	-0.000979 (-0.28)
Marital Status		
Single (ref)	0 (.)	0 (.)
Married	-0.396*** (-12.60)	-0.154*** (-12.56)
Widowed	-0.522*** (-6.43)	-0.199*** (-6.96)
Divorced	-0.311*** (-3.60)	-0.122*** (-3.71)
Sector of activity		

Agriculture and Fisheries	1.302***	0.484***
	(37.99)	(44.07)
Extractive Industries	-0.332*	-0.0898**
	(-2.32)	(-2.68)
Manufacturer Industries (ref)	0	0
	(.)	(.)
Electricity	-0.154	-0.0447
	(-1.40)	(-1.48)
Construction	1.315***	0.489***
	(35.08)	(40.58)
Trade and repairs	0.674***	0.246***
	(18.68)	(19.26)
Transport	0.249***	0.0834***
	(4.54)	(4.38)
Accommodation & Catering	0.545***	0.195***
	(9.53)	(9.04)
Telecommunication and information	-0.302**	-0.0826**
	(-2.59)	(-2.94)
Financial, administrative and other services	-0.177***	-0.0510***
	(-5.58)	(-5.48)
_cons	2.022***	
	(16.55)	
N	29383	29383

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Source: Authors

G. Econometric estimations for determinants of transition to formality

Table G1. Probit model estimation and Marginal effect analysis to analyze the determinants of transition to formality

	(1)		(2)	
	Probit model y: nosocials	Marginal effects	Probit model y: notformal	Marginal effects
main				
Age	-0.0410**	-0.0118**	-0.0386*	-0.00884*
	(-2.83)	(-2.85)	(-2.56)	(-2.57)
AgeSquare	0.000319	0.0000918	0.000297	0.0000681
	(1.83)	(1.83)	(1.60)	(1.60)
havechild	-0.0554	-0.0160	-0.0183	-0.00419
	(-0.48)	(-0.48)	(-0.14)	(-0.14)
single	0.253*	0.0729*	0.0702	0.0161
	(2.00)	(2.00)	(0.51)	(0.51)
widow	0.381	0.110	0.365	0.0837
	(1.50)	(1.50)	(1.30)	(1.30)
divorced	-0.133	-0.0382	-0.296	-0.0678
	(-0.70)	(-0.70)	(-1.39)	(-1.39)
Male	0.0953	0.0275	0.0797	0.0183
	(1.46)	(1.47)	(1.19)	(1.20)
illiterate	0.499***	0.144***	0.382***	0.0875***
	(5.15)	(5.16)	(3.38)	(3.37)
secondary	-0.206***	-0.0594***	-0.317***	-0.0727***
	(-3.31)	(-3.36)	(-4.67)	(-4.81)
tertiary	-0.639***	-0.184***	-0.834***	-0.191***
	(-4.88)	(-4.94)	(-6.45)	(-6.62)
parttime	0.290***	0.0836***	0.364***	0.0833***
	(3.36)	(3.37)	(3.49)	(3.49)

seasonal	0.803***	0.231***	1.146***	0.263***
	(8.13)	(8.22)	(7.86)	(7.97)
ocasional	0.767***	0.221***	1.098***	0.252***
	(12.61)	(13.25)	(14.52)	(15.72)
Region				
Centre Est	-0.180	-0.0520	0.0355	0.00813
	(-1.90)	(-1.91)	(0.36)	(0.36)
Centre Ouest	-0.0574	-0.0166	0.0759	0.0174
	(-0.59)	(-0.59)	(0.69)	(0.69)
Nord Est	-0.242*	-0.0697*	-0.0711	-0.0163
	(-2.37)	(-2.38)	(-0.66)	(-0.66)
Nord Ouest	-0.128	-0.0368	-0.200	-0.0459
	(-1.31)	(-1.32)	(-1.92)	(-1.94)
Sud Est	-0.272*	-0.0784*	-0.262*	-0.0600*
	(-2.51)	(-2.53)	(-2.20)	(-2.21)
Sud Ouest	-0.0920	-0.0265	0.152	0.0349
	(-0.77)	(-0.77)	(1.19)	(1.19)
_cons	1.353***		1.525***	
	(4.10)		(4.55)	
N	5622	5622	5826	5826

t statistics in parentheses
* p < 0.05, ** p < 0.01, *** p < 0.001
Source: Authors

H. Econometric estimations for determinants of transition to formality

In this appendix we analyze the impact of wage levels on transition to informality. In order to avoid multicollinearity, other factors affecting the wage level such as level of education and type of work are not included in the Probit regression (Table H1). This estimation shows that earning lower than SMIG[4] increases the chances of remaining informal by 16 to 17%.

Table H1. Probit model estimation and Marginal effect analysis to analyze the determinants of transition to formality

	(1) Probit model y: nosocials	Marginal effects	(2) Probit model y: nosocial	Marginal effects
main				
Age	-0.0330*	-0.0105*	-0.0283*	-0.00916*
	(-2.31)	(-2.32)	(-2.03)	(-2.04)
AgeSquare	0.000310	0.0000984	0.000278	0.0000899
	(1.79)	(1.80)	(1.65)	(1.65)
havechild	-0.0606	-0.0192	-0.0524	-0.0170
	(-0.54)	(-0.54)	(-0.48)	(-0.48)
single	0.166	0.0525	0.162	0.0526
	(1.36)	(1.37)	(1.35)	(1.36)
widow	0.468*	0.148*	0.489*	0.158*
	(1.98)	(1.98)	(2.07)	(2.08)
divorced	-0.101	-0.0319	-0.142	-0.0461
	(-0.55)	(-0.55)	(-0.75)	(-0.75)
Male	0.245***	0.0778***	0.243***	0.0786***
	(4.13)	(4.26)	(4.37)	(4.49)
Region	-0.241*	-0.0764*		
Centre Est	(-2.41)	(-2.44)		
	0.314**	0.0997**		

[4] Tunisian legal minimum wage is equal to 313.892 dinars/Monthly : http://www.humanforcetunisie.com/Bibli/smig-tunisie.php

Centre Ouest	(3.10)	(3.06)		
Nord Est	-0.339**	-0.108***		
	(-3.25)	(-3.32)		
Nord Ouest	0.183	0.0580		
	(1.84)	(1.82)		
Sud Est	-0.198	-0.0629		
	(-1.75)	(-1.77)		
Sud Ouest	-0.0252	-0.00800		
	(-0.21)	(-0.21)		
Wage bellow SMIG	**0.517*** **	**0.164*** **	**0.535*** **	**0.173*** **
	(9.06)	**(9.20)**	**(9.40)**	**(9.46)**
_cons	1.020**		0.815**	
	(3.14)		(2.68)	
N	5120	5120	5120	5120

t statistics in parentheses

* p < 0.05, ** p < 0.01, *** p < 0.001

Source: Authors

I. Multinomial logit analysis among 3 transition categories

Table I1. Multinomial Logit analysis

	Transition Category		
	(1)	(2)	(3)
	Informal-formal	Informal-formal-informal	Reference category Informal-informal
AgeSquare	-0.000569*	-0.000546	0
	(-2.08)	(-1.71)	(.)
Age	0.0611**	0.0602*	0
	(2.74)	(2.22)	(.)
urban	0.370***	0.286**	0
	(4.54)	(2.89)	(.)
havechild	0.134	0.219	0
	(0.78)	(1.05)	(.)
single	-0.337	-0.485*	0
	(-1.87)	(-2.15)	(.)
widow	-0.506	-0.816	0
	(-1.29)	(-1.55)	(.)
divorced	0.0793	-0.459	0
	(0.27)	(-1.04)	(.)
Male	-0.0525	0.296**	0
	(-0.62)	(2.65)	(.)
illiterate	-0.885***	-0.731***	0
	(-4.93)	(-4.01)	(.)
secondary	0.455***	0.190	0
	(5.01)	(1.74)	(.)
tertiary	1.129***	-0.0862	0
	(8.16)	(-0.37)	(.)
parttime	-0.829***	-0.275*	0
	(-5.74)	(-1.99)	(.)

seasonal	-2.336***	0.00705	0
	(-9.46)	(0.05)	(.)
ocasional	-1.996***	-0.266**	0
	(-19.23)	(-2.61)	(.)
_cons	-2.327***	-3.572***	0
	(-4.88)	(-5.90)	(.)
N	5795		

t statistics in parentheses

* p < 0.05, ** p < 0.01, *** p < 0.001

Source: Authors

Note: The reference group is category 3 in which individuals do not transition and remain in the informal sector.