Who has an informal job and how is that job paid?

A job-based informality index for nine sub-Saharan African countries

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Kea Tijdens (K.G.Tijdens@uva.nl)

Janna Besamusca (J.Besamusca@uva.nl)

Maarten van Klaveren (M.vanKlaveren@uva.nl)

Amsterdam Institute for Advanced Labour Studies (AIAS), University of Amsterdam

Plantage Muidergracht 12, 1018 TV Amsterdam, The Netherlands

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Abstract

Who has an informal job and how is that job paid? Studies on informal work using survey data are scarce, particularly for Africa, while informal work is high on ILO's decent work agenda and on WTO's trade agenda. This study aims at an empirical contribution to this discussion by developing an index for job-based informality beyond a dichotomous classification, using three dimensions, namely contribution to social security, entitlement to social security, and employment status and contract.

Using representative data of comparable face-to-face 2012 surveys on work and wages sampled from national establishment registers (N=15,420), this paper develops a job-based informality index for nine sub-Saharan African countries (Benin, Ghana, Guinea, Kenya, Madagascar, Niger, Rwanda, Senegal, Togo). Firstly it investigates to what extent a worker's vulnerable personal characteristics and unfavourable workplace settings affect the chance of holding an informal job, secondly the impact of informality on labour market outcomes is explored, specifically on earnings, working hours and collective bargaining coverage.

In all countries, the young and low-educated workers have the lowest scores on the informality index. The effects of gender and households, however, are smaller and not unidirectional across countries. The effects are confirmed for the workplace characteristics micro enterprises, private industry and low occupational status.

The findings indicate that informality indeed significantly lowers the hourly wages, also when controlled for their personal and workplace characteristics. Each step on the 5-pts scale towards formality increases the earnings with 22 per cent, controlled for other factors. Informal workers indeed have a higher chance being paid below the national minimum wage (MW) or the national poverty line (odds ratio increases more than 2 times). As expected, informal workers have a higher chance of working 48 hours or more per week (odds ratio increases 46%). Informal workers indeed have a substantial lower chance being covered by a collective agreement (odds ratio decreases 3 times).

1 Introduction

The ILO *Global Employment Trends* 2012 report indicates that worldwide the shares in total employment of those in vulnerable and poorly paid jobs have steadily declined over the past ten years (ILO, 2012b). However, according to the report, there remain major pockets of informal and precarious work, in particular in sub-Saharan Africa. They are beyond the reach of labour market institutions, such as collective bargaining, minimum wage setting, and labour inspection, and they have no employment protection associated with labour contracts and social security, but also are not paying taxes. This contention is at the basis of this paper.

The research objective of this study is twofold. What are the socio-demographic and workplace characteristics of informal workers in nine sub-Saharan African countries? Which labour market outcomes are related to informal work, especially with respect to wages, pay below the minimum wage level, working hours, and collectve bargaining coverage? In Section 2, this paper reviews the formal-informal divide as discussed in the literature and explores which items should be included when measuring job-based individual-level forms of informality. Section 3 details how the informality index is developed as well as the survey data used for the analysis. In section 4, the personal and workplace characteristics of the formal and informal workers are explored and so are the outcomes of informality in terms of wages, working hours and collective bargaining coverage. This section ends with exploring country-level differences. Finally, in Section 5 we come up with conclusions.

2 Informal work: theoretical perspectives and empirical findings

2.1 The informal economy

In the past decades, the informal economy has evoked considerable interest aiming to estimate and explain its size, particularly in developing countries. Defining and subsequently measuring the

informal economy has proven to be not an easy task. Increasingly the range of indicators has been broadened, as can for example as be grasped from ILO, IMF and World Bank publications. ILO's International Conference of Labour Statisticians has put quite some efforts in defining the informal sector, attempting to harmonise as much as possible the definitions in use in various countries. In their joint overview study, ILO and WTO (2009: 40) distinguish three views, namely the dualist school, the structuralist school and the legalist school: "Dualists view the informal sector as the inferior segment of a dual labour market, with no direct link to the formal economy, while structuralists see it as comprising small firms and unregistered workers, subordinated to large capitalist firms. Legalists consider the informal sector to comprise micro-entrepreneurs who prefer to operate informally to avoid the costs associated with registration." The indicators used range from legal dimensions, such as contributing taxes or social security, or being subject to labour law, to economic dimensions, such as production beyond self-provision, mostly defined as the agricultural versus the non-agricultural sector. Increasingly, various measurement levels were distinguished. Initially the main focus was on macro-economic indicators, evoking a range of studies aiming to explain the relative size of the informal sector across countries. Comparing 32 Latin American countries, Vuletin (2008) finds that the tax burden, the importance of the agricultural sector, and the significance of labour rigidities are decisive for the size of the national informal economy, representing altogether around 79 per cent of the informal economy variance, whereas inflation does not contribute to the explanation. Most empirical studies on the informal economy have used aggregate data (Cf. Freeman, 2009). Few studies have focussed on individual-level analyses, using micro-data. Our study aims to contribute to the body of knowledge for this field by using micro-data from nine sub-Saharan African countries.

The ILO/WTO (2009) study explores the viewpoints of both organisations. From ILO's labour relations point of view, the informal economy was excluded from the benefits and rights incorporated in the labour laws and social security systems. From WTO's industrial point of view, the main distinction between the formal and the informal economy was that the latter was not subject to tax regulations and was excluded from administrative rules covering property relationships, financial credit systems, and commercial licensing. The study quotes Portes et al. (1989), defining the informal economy as "a process of income-generation characterized by one central feature: it is unregulated by the institutions of society, in a legal and social environment in which similar activities are regulated." The multidimensional concept behind this viewpoint is confronted with the limited possibilities to measure these dimensions, resulting mostly in a simple dichotomy drawing the borderline between the formal and informale labour force identical to the line between wage earning and self-employment (ILO/WTO, 2009: 39).

A recent ILO study about measuring informality disentangles the multidimensinal concept by stating that the definition relates to the sampling unit of the data-collecting, thereby distinguishing measurement issues in establishment surveys, household surveys and surveys of individuals, either separate or in combination (ILO 2012). Hence, the role of micro-economic data is given prominence over macro-economic data. When informality is measured at the level of economic units it will define the informal economy as the status of activities (registered or unregistered), access to social coverage or the size of economic units. When informality is measured at the level of households, the primary focus is at defining the degree of self-provision in the household. When informality is measured it focuses on the degree to which the worker is subject to labour regulation and social security.

2.2 Informal workers: country-level variations

A major body of empirical work concerning the incidence of informal employment has focused on differences across countries, using aggregate data. Having been concentrated on aggregate effects, this research also tended to define informal employment on a sectoral basis or on broad estimates of enterprises' evasion of taxes and social contributions. As a consequence, its indicators are often proxies of economic performance and structure, or of labour market regulation. These analyses are to a considerable degree based on the so-called two-sector model, which divides between an informal, largely agricultural sector and a more formal urban labour market.

Investigating the relationship between sector and employment status, Budlender (2011), using the 2008 Namibia Labour Force Survey, notes that 76% of rural employed persons are employees, as against 85% in urban areas. Further, more than half of the rural employees are informal while among

urban employees a clear majority are formal. In both rural and urban areas, 5% of all employed persons are formal employers or own account workers, but in rural areas a further 19% are informal employers or own account workers as against only 8% in urban areas. The bivariate relationship between employment status and the agricultural and non-agricultural sector, however, does not yet prove that the *jobs* performed by workers are informal. Richard Freeman (2009), eloquently criticising the two-sector model used in many studies of informal work, reviews the debate on market forces and labour market institutions. Looking into effects of the cost of hiring and firing, mandated benefits, minimum wages, unionisation, and centralisation of wage bargaining, Freeman presents many ongoing debates and sometimes contradictory outcomes in different pieces of research that cover different world regions, times, data levels and that use different methods.

Another link is that between informality and income inequality, which in macro-level studies is by now well-established (ILO/WTO, 2009: 92). Empirical studies have demonstrated that standard measures of income inequality, such as the Gini coefficient, are highly correlated with the incidence of informal employment (Kucera and Xenogiani, 2009a; 2009b). This remains the case when controlling for various other factors, such as the quality of governance and government spending as a share of GDP, or when using different indicators to measure the size of the informal economy, as has been proven for Latin America, the Caribbean and the Arab world (Elbadawi and Loayza, 2008; Loayza et al., 2009). As demonstrated by Kucera and Roncolato (2008), standard poverty measures (such as the share of the population living below 2 US$ a day) are closely related to the share of informal employment in a cross-country analysis. Nevertheless, such an aggregate picture masks differences among informal workers at the microeconomic level, as the measured wage gap varies substantially between different segments and tiers of the informal economy (Bargain and Kwenda, 2009). Indeed, depending on the type of informal work – informal employer, self-employed, casual worker or home worker – informal employment is remunerated at vastly different levels, further contributing to distributional concerns (Carr and Chen, 2002).

2.3 Job-based definitions of informal work

How to distinguish formal from informal workers? The 15th (1993) and 17th (2003) International Conferences of Labour Statisticians (ICLS) adopted international statistical definitions, distinguishing formal or informal jobs according to their status-in-employment categories, including own-account workers, contributing family workers, domestic workers and workers in enterprises with less than five workers to estimate the size of the informal labour force. In 2002, ILO's International Labour Conference at its 90th Session adopted the conclusions on Decent Work and the Informal Economy and called upon the ILO to "assist member States to collect, analyse and disseminate consistent, disaggregated statistics on the size, composition and contribution of the informal economy that will help enable identification of specific groups of workers and economic units and their problems in the informal economy" (Hussmanns, 2004). Hence, in ILO circles informal employment is understood to include all remunerative work – both self-employment and wage employment – that is not recognized, regulated or protected by existing legal or regulatory frameworks and non-remunerative work undertaken in an income-producing enterprise.

In a joint ILO/WTO study concerning globalisation and informal jobs in developing countries, it is stressed that additional information on the incidence of informal employment can be drawn from labour force surveys that include questions concerning the self-assessed labour market status or coverage by social security systems (ILO/WTO, 2009: 55). Some statistical agencies, such as that of South Africa, have included these types of questions in their surveys. The assessment of social protection coverage, in particular, helps to characterize the qualitative aspects related to decent working conditions in the informal economy. The method is not free from weaknesses, and may fail for example if respondents do not have appropriate information regarding the registration status of the enterprise in which they work. To assess the size and scope of informality in an economy, survey-based estimates certainly have limitations, but there is no alternative if one wants to investigate the socio-demographic and other characteristics of the informal labour force.

Many African countries are at an experimental stage in terms of measuring informality and are not yet able to provide a measurement on a regular basis of this issue (e.g. South Africa that uses self-assessment questions). Budlender (2011), using the Namibia Labour Force Survey 2008 with survey

questions on income taxation, reports that three quarters (67%) of formal employees have income tax deducted from their wage or salary, while this is the case for only 12% of informal employees, most common for government employees. Even Statistics South Africa only presents statistics dividing between the formal and informal *sector* on a regular basis, thus not covering informal *employment* -- though defining informal employment to consist of all persons in the formal sector as well as those working in the formal sector and persons working in private households who are not entitled to basic benefits such as pension or medical aid contributions from their employer and who do not have a written contract of employment (f.e. SSA, 2013). Nevertheless, by combining various official sources, for South Africa estimates can be produced concerning the share of formal sector workers employed in the standard employment relationship, including clear and written contracts and transparent wages. Von Holdt and Webster (2008) estimated for 2003 that 47 per cent of the South African labour force at large belonged to such a "core", implying that 53 per cent worked under precarious conditions. Along the same lines, Van Klaveren and Tijdens (2012: 83) estimate for 2009 the "core" share to have been decreased to 38 per cent. Applying several definitions of informal work on data of the South African Quarterly Labour Force Survey, Derek (2012) finds the proportion informal workers to vary largely. Other relevant statistical agencies, like the Kenya National Bureau of Statistics, explicitly equate the (in)formal sector with (in)formal employment (Cf. Fashoyin, 2010).

A major step forward was made by Luebker (2008) in his analysis of the data of Zimbabwe's 2004 Labour Force Survey. This author distinguishes two complementary concepts of informality: (i) the enterprise-based concept of informality and (ii) the jobs-based concept of informality. The first concept builds on the characteritics of the production unit, contrasting establishments registered under national legislation, as well as in all international organisations, local and central government units and parastatals with all other production units, i.e. all those that are not registered and are not local and central government or parastatals, with the exception of households employing paid domestic workers and those involved in communal farming. Whereas the grouping of own-account workers, employers and unpaid family workers follows from the characteristics of the production unit, the jobs-based concept of informality included a proxy to distinguish between formal and informal employees: all paid employees (permanent) were classified as formal employees, and all paid employees (casual/temporary/contract/seasonal). Due to data limitations, Luebker (2008) could not include being subject to labour legislation as a criterium to distinguish formal from informal jobs. Hence, neither contributing to or receiving social security, nor being subject to dismissal regulations, entitlement to paid annual or sick leave, or contributing to income tax could explicitely be operationalised. The joint ILO/WTO study concerning globalisation and informal jobs in developing countries stressed the multidimensional nature of informal work and followed Luebker's distinction, stating that informality could also be defined at the worker level, based on employment relations. From this perspective, informal workers are those who do not benefit from any social or labour security, i.e. regulation on hiring and firing, minimum wage, protection against arbitrary dismissal and health and social insurance (ILO/WTO, 2009).

2.4 Informal workers: their personal and workplace characteristics

The discussion that informal employment goes along with poor working conditions for vulnerable workers in micro workplaces challenges to further detail the socio-demograpih and workplace characteristics of both the formal and the informal workforce. In a number of African countries data of Labour Force Surveys have been used to explore these characteristics, in almost all cases in terms of bivariate relationships only. Here, we will review the main findings with respect to the personal and workplace characteristics.

Among the socio-demographic characteristics gender is the most outspoken and most studied. Although near-universally women's share in informal employment is much higher than men's (Van Klaveren and Tijdens, 2012), the evidence concerning the gendered nature of the enterprise-based formal workforce is not overwhelming. Budlender (2011) concludes for Namibia that there is little gender difference in the respective shares of employed who are employees and within the employee category, between formally and informally employed. For Zimbabwe, Luebker (2008) reveals an uneven gender distribution: by either concept of informality, men account for nearly three-quarters of employment in the formal sector and of formal jobs, while women hold the majority of informal jobs and dominate the informal sector and employment in households. Yet, a caveat may be that decades

of research into the gender pay gap have learned that sex-related differences need to be studied in a multivariate setting in order to filter out the effects of women's often inferior occupational status.

Informality seems to be age-related, with mid-aged workers to be relatively more involved in the formal workforce than young and old workers. For Namibia, Budlender (2011) notices that informal workers are more dominant in the younger age groups, up to age 30, whereas formal workers dominate in age groups 30 and over, but informal workers again outnumber formal workers among those aged 60 and above. For Zimbabwe, Luebker (2008) also reveals age-related differences in access to formal employment: young people aged between 15 and 24 years account for almost a third of all workers, but only for 20 per cent of those employed in the formal sector and for only 14 per cent of those with a formal job. Conversely, the 25-to-34 years and 35-to-54 years age groups are over-represented in the formal sector (38 and 36 per cent, respectively) and also provide a disproportionate share of the formally employed (39 and 40 per cent, respectively). Here again, older workers are over-represented in the households and in informal employment.

Low levels of education seem to be strongly related to the incidence of informality, leading the ILO/WTO report (2009) to conclude that a strong emphasis should be placed on training facilities and programmes for informal employees. For Namibia, Budlender (2011) finds a marked decrease in informality as the educational level of the employed individual rises. For Zimbabwe, Luebker (2008) notices that while formal sector workers have generally higher educational attainments – 20 per cent have obtained a diploma or certificate after secondary school and a further 4 per cent hold graduate or postgraduate degrees –, the informal sector shows a mismatch between the largely unskilled work and the educational background of workers: 64 per cent have attended secondary school, and a further 8 per cent have obtained a diploma or certificate after secondary school or even a graduate or postgraduate degree (0.7 per cent). Luebker states one may conclude that many workers in the informal sector perform work that falls far short of their educational background and that their potential remains under-utilized. Yet, this may well be a country-specific conclusion, taking into account the peculiar eonomic and political conditions in Zimbabwe at the time.

Among the workplace characteristics firm size is the most studied, or, to phrase it differently, firm size is often used to distinguish between formal and informal employment. Many statistical agencies define micro-enterprises of five or less workers to belong to the informal economy, mostly by lack of other, possibly more relevant, variables. The sector or industry is one of the most studied factors here, or to phrase it differently again, sector or industry has been applied to distinguish between formal and informal employment, most definitely defining the agricultural sector as to belong to the informal economy. Beyond taking the sector as the distinguishing yardstick, except for agriculture few studies have pointed out which other sectors are most prone to informal employment. For Namibia, Budlender (2011) finds that formal employent is relatively often found in the sector 'factory, office, shop.'

3 Methods and data

3.1 Hypotheses

The research objectives of this paper are twofold. First, the study explores how personal and workplace characteristics are related to informal jobs. Its second aim is to investigate the impact of informality on labour market outcomes. As we employ data from nine African countries, we will control all analyses for country-level differences. The following hypotheses are investigated:

H1) We assume that individuals are more likely to hold informal jobs in case of …
… in case of vulnerable personal characteristics: woman, young, low-educated, or single-head of household
… unfavourable workplace settings, notably in micro-enterprise, in private sector, or in low-status occupation.

H2) We assume that the more informal the workers ...

H2a) … the lower the monetary outcomes of their jobs,

H2b) … the more likely they are paid below the national minimum wage level,

H2c) … the longer their working hours,
H2d) … the more likely not being covered by a collective agreement.

3.2 The data collection

The data used in this study stem from the comparable face-to-face WageIndicator surveys in nine sub-Saharan African countries, notably Benin, Ghana, Guinea, Kenya, Madagascar, Niger, Rwanda, Senegal, and Togo on work and wages.[1] These interviews were held under responsibility of the WageIndicator Foundation (www.wageindicator.org) in close cooperation with Dr. Godius Kahyarara of the Department of Economics at the University of Dar-es-Salam, Tanzania. Two of the three authors of this paper were involved in the questionnaire design and wrote the country reports about the surveys (www.wageindicator.org/main/publications).

The objective of the face-to-face surveys was to collect representative data concerning wages and working conditions in public and private sectors in the national labour markets of the nine African countries. For all nine surveys, the sampling frame was drawn from national establishment registers, using design weights by geographical population size controling for distributions over districts according to the most recent publications of the natonal labour force surveys. In most countries, these registers only included the private sector. In addition, public service institutions were randomly selected. Hence, informality in the sample refers to informal jobs within registered establishments.

The survey aimed at covering all districts in a country. In a few countries problems arose related to traveling to all districts. In those cases as many districts as possible were included. In all nine countries, face-to-face interviews have been held, ranging from 1,413 in Ghana to 2,074 in Rwanda. The sample sizes aimed at representative samples at a confidence interval of 2 and a confidence level of 95 per cent, though in most countries difficulties arose in identifying the exact size of the population, here the total labour force in formal enterprises. Additionally, sample sizes were subject to restrictions regarding time and financial resources. All interviews were held in 2012. In most countries, the data-collection lasted for about a month.

The questionnaire is extracted from the WageIndicator web survey, which is posted on the WageIndicator websites in currently 77 countries, receiving millions of visitors. All web visitors are invited to voluntarily complete a questionnaire with a lottery prize incentive. This web survey is in the national language(s), is adapted to country peculiarities, and asks questions about a wide range of subjects, including basic socio-demographic characteristics, wages, occupations, and other work-related topics (see Tijdens *et al*. 2010). For the face-to-face interviews the main questions from the web survey have been selected to fit the objectives of these interviews.

In all countries, WageIndicator and the University of Dar-es-Salam selected a national interview agency. Most interviewers were familiar with the process of collecting data through face-to-face interviews. Among the interviewers were many students. WageIndicator and the University of Dar-es-Salam developed a training package for the interviewers, including an introduction to the survey and its sampling methods and an explanatory note for the interview questions. In most countries, the interviewer training lasted for 2-4 days. A standard introduction was developed, in which the interviewers introduced themselves, identified the purpose of the interview, assured that respondents' answers would be kept confidential, and requested their participation. For each interview the interviewers had a paper questionnaire form, from which they read the questions exactly as they were written, and the respondents' answers were recorded immediately as they were provided. Each day interviewers handed in their completed forms, which were reviewed by the survey manager to ensure that it was complete and unambiguous. The forms were shipped to Dar-es-Salam for data-entry in the web-based WageIndicator data-entry form.

The dataset of the face-to-face interviews in the nine countries has in total 16,747 observations and 123 variables. For most variables, missing values are low. For the analysis, observations with missing values on the informality index and the personal and workplace characteristics are excluded (7.9%).

[1] Face-to-face interviews were also held in Zambia, Tanzania and Uganda, but in Zambia the survey question about entitlement to social security was not asked, while in Tanzania and Uganda the survey question about contributing to social security was not asked. Unfortunately, these countries therefore had to be excluded from the analyses.

Almost half of these missings are due to the question about contribution to social security (3.6% missing). The remaining sample includes 15,420 observations. Unfortunately, the sample descriptives could not be compared to labour force survey data, due to a lack of surveys using establishments as the sampling basis. Additionall, no comparisons have been made to ILO's EAPEP data, because these samples date from various years and are mostly based on household surveys, thus include both the formal and the informal and do not solely target the enterprise-based formal workforce.[2] For this reason, no weights have been applied to the sample.

3.3 Informality index

By using the establishment registers as sampling frame, the survey addresses workers in registered, thus formal, enterprises. Within formal establishments, formal as well as informal workers can be distinguished, thereby following Luebker's job-based concept of informality given enterprise-based formality (Luebker, 2008). To operationalise the job-based informality a heterogeneous concept of informality has been prefered over a dichotomous indicator. We have developed an index in order to measure the workers' degree of informality, taking their contribution to and entitlement to social security as the two main dimensions and their employment status as the third dimension. The latter includes four categories: self-employed, employee but no contract, employee with fixed-term contract, and employee with permanent contract.

A 5-points' informality-index has been computed, ranging from 1=very informal to 5=very formal. Workers who are not entitled to paid leave, pension and/or social security benefits, who do not contribute to social security, and who have no employment contract are placed at the informal end of the spectrum. Workers who are entitled, do contribute and have a permanent contract are placed at the other end of the spectrum. Table 6 in the Appendix depicts the number of observations in each dimension, showing that across the nine countries one fifth of workers is placed in the midst of the index, while half is in the two most informal and almost one third is in the two most formal categories (data is not weighted across countries). Some 38 per cent state that they are entitled to social security. Up to 42 per cent of workers contribute to social security. Some 12 per cent state that they are not entitled to benefits though they contribute, whereas 7 per cent are entitled who do not contribute.

3.4 Controlling for country-level variation

To test probabilities of holding an informal job and effects of informality on wages, working hours and minimum wages, we did not elaborate any directed hypotheses on the aggregate country level for four reasons. Firstly, while a large body of research already exists, previous work has predominantly operated under a different, sector-based definition of informal employment.This has led to the use of indicators like the level of urbanisation, that equate agricultural work with informal work and are unhelpful for our analysis of job-based informality in registered enterprises. Secondly, the effects of labour market institutions remain contentious (Cf. Freeman, 2009) to such an extent that their discussion goes beyond the scope of this article, which aims to test probabilities of holding an informal job and the effect of informality on labour market outcomes based on individual level data. Thirdly, the country level variation in our dataset containing only nine sub-Saharan African countries, is relatively small. This becomes clear from the bivariate results in the next section as well as an intercept-only fixed effects model attributing just 7 per cent of the variance to differences across countries.

Fourthly, available aggregate data proved insufficiently reliable in various tests. We tested a range of country-level variables, which are widely available from the UN and World Bank databases. Rejecting any independent variables that are limited to explaining the size of the informal sector instead of the incidence of job-based informality, we looked at factors measuring the size of the social security system, economic or human development and income inequality. The size of the social security system or strength of the state are potentially interesting predictors, since a larger pay-back and more enforcement can reasonably be expected to increase public support for formalised labour relations.

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[2] Benin: 2002 population census; Ghana: 2006 Ghana Living Standards Survey; Guinea: none; Kenya: 2005 household survey; Madagascar: 2005 labour force and household surveys; Niger: 2001 population census and 2205 household or labour force survey; Rwanda: 2001 national employment and labour force survey; Senegal: 1985 official government estimates; Togo: 2006 household or labour force survey

The IMF collects data on government expenditure, expenditure on education, government transfers and subsidies, as well as government enterprises and investment. These data, however, are not available for all nine countries in the same year and closer study reveals erratic trends, making expenditure in the previous year a poor indicator of expenditure in the next.

Previous reseach has unanimously shown that, on a global scale, the informal sector shrinks and wages increase with progress. The United Nations produce an annual Human Development Index (HDI), in which 186 countries are ranked on a scale the UN calls "human progress" from high (1) to low. The HDI is a composite index, measuring aggregate development on the dimensions of health, education and income, for each of which standardised indices are created. The health index is a measure of life expectancy at birth, education is measured as the geometric mean of standardised values of mean years of schooling and expected years of schooling; income is measured as per capita GNI in 2005 PPP. The composite index is the geometric mean of the three dimensions, resulting in a scale from 0 (undeveloped) to 1 (highly developed), on which for 2012 the nine countries in the analysis ranged from .304 (Niger) to .558 (Ghana) (UNDP, 2013). Because a reliability test of the composite indices results in a moderately strong scale (Cronbach's Alpha is .665) we also tested the three dimensions separately and an examination of the distribution reveals large heteroskedasticity.

The HDI, however, does not include a measure on income distribution, which has been found to affect the incidence of informal work. We therefore tested a separate indicator, using the Standardized World Income Inequality Database (SWIID), which standardises the UN's world income inequality database for greater comparability. The SWIID data contains Gini coefficients, the measure for income inequality most used, running theoretically from 0 – all income is completely equally distribution – to 100 – all income goes to one reference unit, while the others receive nothing (Solt, 2009). In practice, observed values range from 15 to 71, or from 34 (Togo) to 46 (Kenya) in the nine countries included in the analysis. The Gini coefficients of the nine countries in the dataset are derived from data from 2005 (Kenya, Madagascar, Niger and Senegal) and 2006 (Benin, Ghana, Guinea, Rwanda and Togo) (SWIID, 2011). A bivariate test, however, revealed only a weak association with the incidence of informality (correlation .3), which might be due either to the time lag in the data or its limited applicability to job-based informality.

Thus, a close inspection of available aggregate measures failed to inspire confidence that their inclusion in the analysis would improve the models. While rejecting the macro level indicators, however, we do acknowledge that countries differ in the respect to the incidence of informality as well as wages. We therefore control for all country level effects by introducing dummies to the models and clustering standard errors.

3.5 Operationalisations and models used

For the four personal characteristics, we used the respondent's gender and age group, as well as the internationally comparable International Standard Classification of Education classification 1997 (ISCED), designed by UNESCO, which was derived from the national educational categories used in the questionnaires. ISCED classes 1 and 2 were coded as low education, and ISCED classes 5 and 6 as high education. Households were identified as single-headed when respondents had no partner, but had children living in their households.

To identify the unfavourable workplace settings, we used the survey question about coverage by collective agreements, whereby the answers 'don't know' and 'not aplicable' were considered a 'no'answer. Micro-enterprises were defined as enterprises with less than 5 workers, based on the survey question about firm size. The private sector was derived from the NACE_rev2.0 industry coding, based on the survey question about industry, and classified by the interviewer into the categories in a showcard. For the analysis the NACE categories N-Q, notably Administrative and support service activities; Public administration and defence, compulsory social security; Education; Human health and social work activities, have been classified as the public sector and all remaining industries as the private sector. Low-status occupations have been defined using the ISEI International Socio-Economic Index of occupational status for ISCO-08, ranging from lowest to highest status (values 10- 89). ISEI values 10-29 are defined as low-status occupations, and ISEI values 45-89 as high-status occupations.

To test hypothesis 1, the 5-points informality scale is recoded into three categories, in order to apply a multinomial logit analysis to identify which respondents are likely to fall into which category. To test hypothesis 2, the monetary outcomes, the working hours and the collective bargaining coverage is identified. The survey asks respondents in detail about their earnings. To operationalise the monetary outcomes, we used the net monthly wages. In case the net wage was missing the gross wage is used if supplied. If the pay period was not one month, the monthly wages are computed accordingly. Next, the monthly wages is converted into hourly wages, thereby controlling for the hours worked with a maximum of 80 hours per week. The hourly wages in national currencies were standardized into US Dollar (USD) using the 2012 purchasing power parity (PPP) data from the World Bank Database.

To test hypothesis 2a) - the more informal the workers the lower the monetary outcomes of their jobs - we ran OLS regressions on the log net PPP standardized hourly wages, controlled for country and for the personal and workplace characteristics used in hypothesis 1. To test hypothesis 2b) - the more informal the workers the longer their working hours - we applied a logit model to identify which workers worked more than 48 hours per week, controlled for country and personal and workplace characteristics. To test hypotheses 2c) - the more informal the workers the more likely they are paid below the national minimum wage level – and 2d) – the more informal the workers the less likely they are covered by a collective agreement - we applied a logit model, also controlled for country and personal and workplace characteristics.

For the likelihood of being paid above or under the national minimum level a binary variable is computed. Information about the minimum wages is derived from the information collected by the WageIndicator team using national experts (Table 13 in Appendix). Guinea and Rwanda have no minimum wage setting and we therefore use the national poverty lines, which in both countries is defined per month.[3] Three countries apply a monthly minimum wage (Benin, Niger, Togo). For these countries, the binary variable is computed by comparing the reported monthly wage to the national monthly minimum wage or poverty line. Hence, a part-time worker not earning the monthly minimum wage due to few working hours is classified as not earning the minimum wage. However, workers with less than 30 hours a week but with a second job – for which we do not know the hours and earnings - were classified as earning the minimum wage. Madagascar and Senegal use an hourly minimum wage and both countries apply a lower minimum wage for agriculture. Ghana has a daily minimum wage, assuming an 8-hour day, and we therefore treat this as an hourly minimum wage pro rato. Kenya applies a daily minimum wage, detailed for 22 occupational and regional groups. Kenya has not specified the number of hours per day, but similar to Ghana we assume an 8-hour day. For the countries with hourly minimum wages, the binary variable is computed by comparing the reported hourly wage to the national hourly minimum wage.

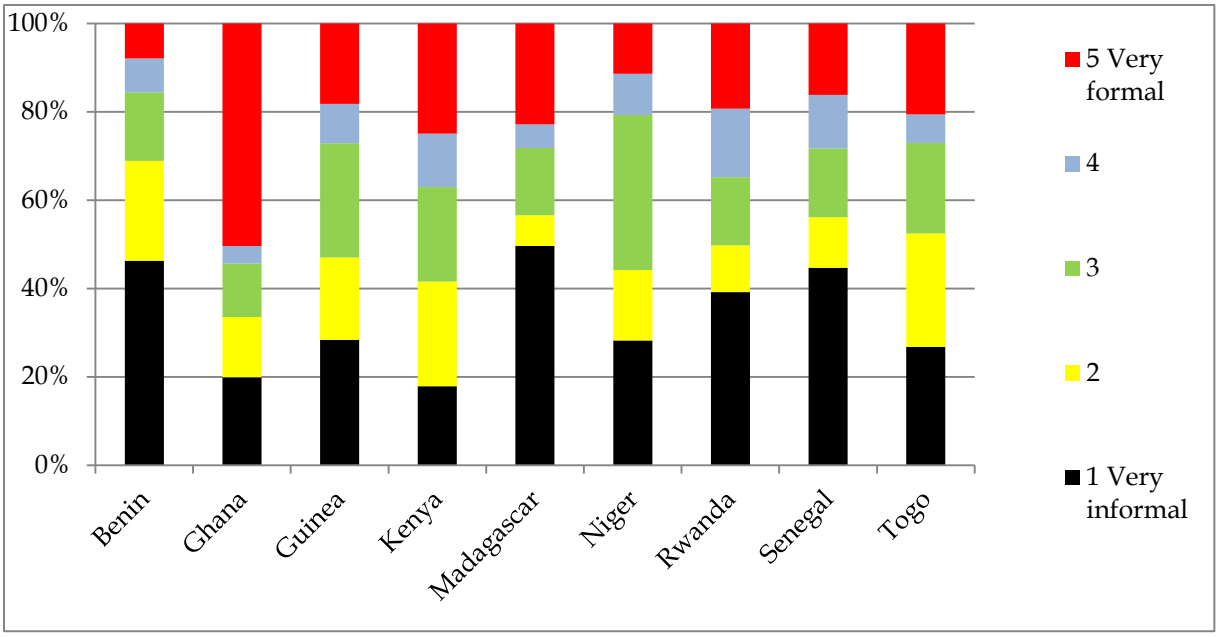
[3] Guinea does not have a country-wide minimum wage. While the law offers the possibility to set wages in sectoral or firm level collective agreements, this systems is not applied very effectively. On the 14th of December 2012, after the interviews for this report had already been done, trade unions, employers and the government signed an agreement to introduce an country-wide minimum wage that should apply to all occupations as the minimum.

4 Findings: Determinants and impact of informality

4.1 The informality-index

The 5-points informality-index is based on three dimensions, namely on contribution to social security, on entitlement to social security, paid leave or pension, and on employment status. The index ranges from 1=very informal to 5=very formal. The means of the informality-index range from 2.10 in Benin to 3.51 in Ghana. Graph 1 shows the distribution over the five classes of the index by country, revealing that the high score for Ghana is particularly due to the 50% of the workers in the very formal category. The Graph also shows that in Niger a particularly high share of workers is found in the middle category, whereas the lowest share in the very informal category is found in Kenya. The graph clearly shows that the five categories are not normal distributed but that the peaks are at both ends and in the middle.

Graph 1 Distribution over the five categories of the informality-index by country

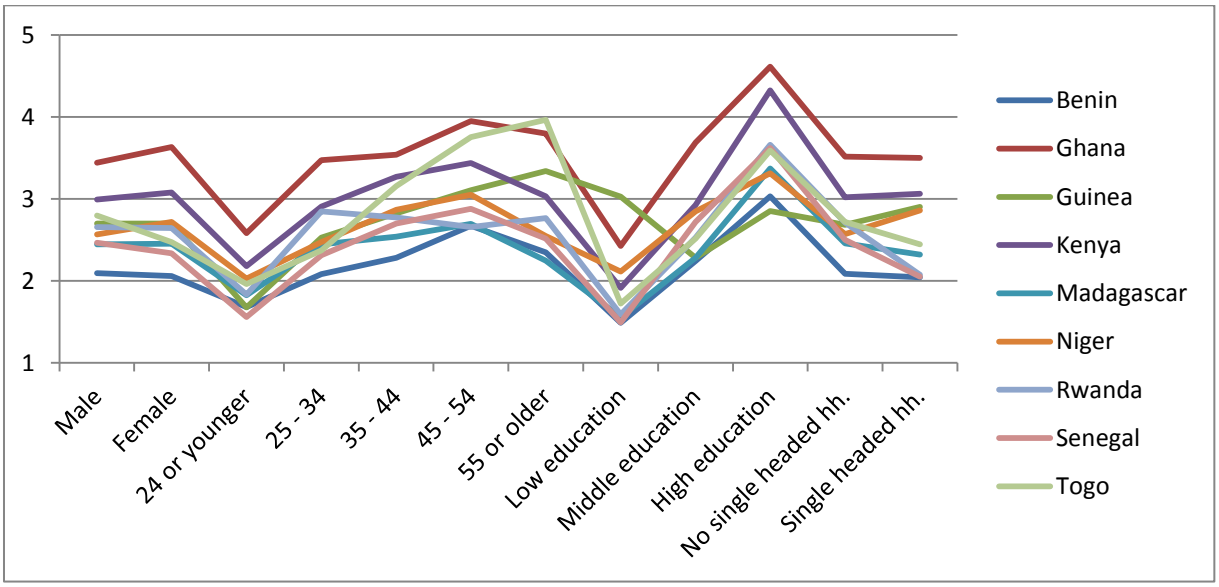


Source: WageIndicator face-to-face survey African countries, 2012, unweighted data (N=15,420)

4.2 Personal and workplace level variation in the informality-index

The first research objective aims to explore the relationship between personal and workplace characteristics and the scores on the informality index. Four personal characteristic have been explored: gender, age, education, and household composition. Three workplace settings have been explored: firm size, private versus public sector, and occupational status. Graph 2 shows the mean values of the personal characteristics across the nine countries, revealing a rather similar pattern across the countries. In almost all countries, the younger workers and the low educated have the lowest scores on the informality index. According to a bi-variate examination (not presented here) the effects of gender and household composition, however, are smaller and not unidirectional across countries.

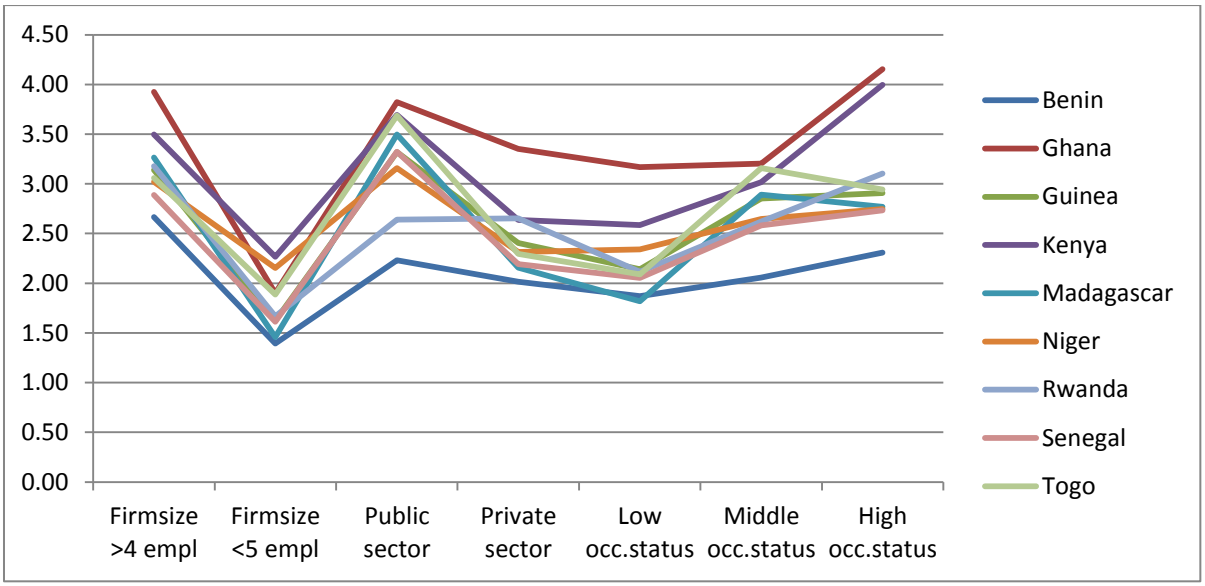
Graph 2 Means for the informality-index (1=very informal,..,5=formal) for two genders, five age groups, three education groups, and single-headed household by country



Source: WageIndicator face-to-face survey African countries, 2012, unweighted data (N=15,420)

Graph 3 shows the mean values of the workplace characteristics across the nine countries, revealing again a rather similar pattern across the countries with the workers in firm sizes <5 employees having particularly low formality scores.

Graph 3 Mean values for the informality-index (1=very informal,..,5=formal) for two firm sizes, public and private sector and three occuational status categories by country



Source: WageIndicator face-to-face survey African countries, 2012, unweighted data (N=15,420)

Using multinomial logistic regression analysis, we test the effects of personal and workplace characteristics on the probability of holding an informal or a formal job (Table 1). For this purpose, the five-point informality scale is recoded into three categories by joining the upper two and the lower two categories into "formal" respectively "informal", to be compared to the base category, the workers with an in-between formality score.

As table 1 shows, women are 7 per cent more likely to hold informal jobs versus in-between jobs, but they are also 16 per cent more likely to hold formal jobs versus in-between jobs. Hence, the male workers will be found more frequently in the in-between group. This is consistent with the previous reported bi-vaiate findings. A young age, here defined as below 35 years of age, increases the odds

ratio of an informal versus an in-between job with 60 per cent and decreases the odds ratio of a formal versus an in-between job with more than 40 per cent. Being a worker with a high education decreases the odds ratio of an informal versus an in-between job with more than 50 per cent and it increases the odds ratio of a formal versus an in-between job with 55 per cent. Being a worker with a low education reveals the opposite tendency. For a worker with a low education the odds ratio of having an informal versus an in-between job increases with 67 per cent whereas it decreases for having a formal versus an in-between job with more than 100 per cent. Being a single headed household does not significantly affect the chance on an informal job, but it decreases the odd ratio for a formal versus an in-between job with 24 per cent.

The results for the workplace characteristics are as follows. Being a worker in a small firm with 4 or fewer employees increases the odds ratio of an informal versus an in-between job with 164 per cent whereas it decreases the odds ratio of a formal versus an in-between job with 194 per cent. Working in the private industry increases the odds ratio of an informal versus an in-between job with 140 per cent whereas no significant results are found concerning the odds ratio of a formal versus an in-between job. Finally, a high status occupation decreases the odds ratio of an informal versus an in-between job, but it does not affect the odds ratio of a formal versus an in-between job. Working in a low-status occupation increases the odds ratio of an informal versus an in-between job with 18 per cent whereas it decreases the odds ratio of a formal versus an in-between job with 36 per cent.

Table 1 presents two models, notably excluding and including country dummies with Togo as the reference country. A first conclusion from Table 1 is that the odds ratios for the personal and the workplace characteristics hardly vary between the two models, pointing to a rather similar pattern accross the countries, thereby supporting the conclusions from the bi-variate analyses. A second conclusion is that in Ghana, Kenya, Madagascar, Rwanda and Senegal in comparison to Togo the odds ratios increase for holding a formal versus an in-between job, whereas they decrease for Benin, Guinea, Niger, with insignificant findings for Benin. The odds ratios for holding an informal versus an in-between job increase for Benin, Madgascar, and Senegal in comparison to Togo, while they decrease for Guinea, Kenya, and Niger, with insignificant findings for Ghana and Rwanda.

In conclusion, hypothesis 1 is confirmed for the concerning the personal characteristics age and education, but not concerning gender and household composition, and it is confirmed for the workplace characteristics micro enterprises, private industry and occupational status. The country dummies show that national differences do exist and that all countries are significantly different from the reference country Togo, except Ghana and Rwanda in the informal model and Benin in the formal model.

Table 1 Parameter estimates of workers' personal and workplace characteristics and countries on probabilities of holding a formal or an informal job versus an in-between job (multinomial logistic regressio: odds ratios, sign levels, standard errors)

	Model 1			Model 2		
Informal vs in-between	Exp(B)	Sig.	Std. Err.	Exp(B)	Sig.	Std. Err.
Intercept						
Female	1.068		0.05	1.004		0.05
Young (age <35 yrs)	1.601	***	0.05	1.583	***	0.05
Single headed hh	0.932		0.08	0.971		0.08
High education	0.650	***	0.06	0.616	***	0.06
Low education	1.675	***	0.05	1.790	***	0.06
Small firm (<=4 empl)	2.638	***	0.06	2.709	***	0.06
Private industry	2.372	***	0.05	2.254	***	0.05
High status occupation	0.809	***	0.06	0.795	***	0.06
Low status occupation	1.182	***	0.06	1.160	**	0.06
Benin				1.518	***	0.09
Ghana				1.033		0.11
Guinea				0.807	**	0.09
Kenya				0.720	***	0.10
Madagascar				1.483	***	0.09
Niger				0.405	***	0.09
Rwanda				1.160		0.09
Senegal				1.271	**	0.09
Formal vs in-between	Exp(B)	Sig.	Std. Err.	Exp(B)	Sig.	Std. Err.
Intercept						
Female	1.163	***	0.05	1.069		0.05
Young	0.701	***	0.05	0.723	***	0.05
Single headed hh	0.806	**	0.09	0.826	**	0.09
High education	1.566	***	0.06	1.896	***	0.06
Low education	0.493	***	0.07	0.618	***	0.07
Small firm (<=4 empl)	0.452	***	0.05	0.475	***	0.05
Private industry	1.022		0.05	0.967		0.05
High status occupation	0.950		0.06	0.967		0.06
Low status occupation	0.732	***	0.06	0.717	***	0.07
Benin				0.902		0.11
Ghana				4.143	***	0.11
Guinea				0.836	*	0.10
Kenya				1.633	***	0.10
Madagascar				1.346	***	0.10
Niger				0.564	***	0.10
Rwanda				1.762	***	0.10
Senegal				1.594	***	0.10
Log likelihood (df) sign.	2449.48	18	0.00	8621.40	34	0.00
Nagelkerke Pseudo R-Square	.296			.342		

Source: WageIndicator face-to-face survey African countries, 2012, unweighted data (N=15,420)
**** p<0.01, ** p<0.05; * p<0.10, Reference group countries: Benin*

4.3 Labour market outcomes: wages, minimum wages, working hours and coverage

4.3.1 Wages

According to hypothesis 2a) we expect that a higher degree of informality results in lower monetary outcomes of the job. In our base model (Table 2) informality indeed significantly lowers the hourly wages: with every step on the 5-point scale towards formality the log hourly wage increases with 41 per cent. Note that a model without country dummies reveals a similar effect (not in the Table).

Once the results are controled for personal and workplace characteristics, for each step towards formality the earnings still increase with 24 per cent. Gender does not significantly affect the hourly wages. An older age or a high education increase the hourly wages, whereas having a low education lowers the wage. Being a single-headed household does not significantly affect the wage.

Working in a micro-workplace lowers the hourly wage with 38 per cent lower and working in the private sector does so with 13 per cent, whereas working in a high occupational status job increases the hourly wages. Compared to Togo, signficant negative effects on the wages are found for Kenya and Madagascar, while positive effects are found for Benin, Ghana, Rwanda and Senegal. Guinea and Niger reveal insignificant effects.

Table 2 Parameter estimates of workers' personal and workplace characteristics and country on their wages (log net hourly wage in standardised USD) (OLS regression)

	Base model			Full model		
	B	Std. Err.	Sign	B	Std. Err.	Sign
Constant	-1.171	0.03	***	-2.023	0.11	***
Informality (1=inf,..,5=form)	0.407	0.01	***	0.218	0.01	***
Female				0.018	0.02	
Age (13-82)				0.066	0.01	***
Age squared				-0.001	0.00	***
Single headed household				-0.028	0.03	
High education				0.565	0.02	***
Low education				-0.370	0.02	***
Firm size 1-4				-0.376	0.02	***
Private sector				-0.130	0.02	***
High status occupation				0.212	0.02	***
Low status occupation				-0.112	0.02	***
Benin	0.151	0.04	***	0.259	0.04	***
Ghana	0.059	0.04		0.219	0.04	***
Guinea	0.053	0.04		0.027	0.04	
Kenya	-0.188	0.04	***	-0.073	0.04	*
Madagascar	-0.435	0.04	***	-0.478	0.04	***
Niger	-0.155	0.04	***	0.010	0.04	
Rwanda	0.215	0.04	***	0.241	0.03	***
Senegal	0.364	0.04	***	0.419	0.04	***
R	0.49			0.60		
N	14983			14983		

Source: WageIndicator face-to-face survey African countries, 2012
**** p<0.01, ** p<0.05; * p<0.10*

4.3.2 Above minimum wage or poverty line

According to hypothesis 2b) we expect that a higher degree of informality increases the likelihood of being paid below the national minimum wage (MW) or the national poverty line (for definitions see section 3.5 and Appendix Table 13). The results of the analysis is hown in Table 3.

Indeed, as expected, the odds ratio for informal workers to be paid below the minimum wage or poverty line are almost three times higher compared to the in-between and the formal workers, as the base model shows. When controlled for personal and workplace characteristics, the odds ratio still increases more than two times.

The results further reveal that neither gender nor being a single-headed household affect the probability significantly. Yet, the odds ratio for the chance to be paid above the threshold decreases by 57 per cent a young worker and by 81 per cent for a low-educated worker. The odds ratio decreases by 55 per cent when working in a small enterprise, by 50 per cent when working in the private secctor, and by 14 per cent when working in a low-status occupation.

The odds ratio of being paid above the threshold decreases for workers in Rwanda compared to workers in the reference country Togo. For the workers in all other countries the odds ratio increases, apart from Kenya and Madagascar, where the effects are insignificant.

Table 3 Parameter estimates of workers' personal and workplace characteristics and country on the likelihood of being paid above the relevant minimum wage or poverty line (binary logistic regression)

	Base model			Full model		
	Exp(B)	Sig.	S.E.	Exp(B)	Sig.	S.E.
Informal (1/2 on index)	0.338	***	.048	0.483	***	.052
Formality (4/5 on index)	2.898	***	.061	2.039	***	.065
Female				0.965		.043
Young (age <35 yrs)				0.635	***	.041
Single headed household				0.916		.067
High education				3.188	***	.064
Low education				0.550	***	.046
Firm size 1-4				0.643	***	.052
Private sector				0.667	***	.049
High status occupation				1.377	***	.050
Low status occupation				0.874	***	.048
Country (ref: Togo)				0.000	***	.000
Benin	1.913	***	.074	2.540	***	.080
Ghana	1.066		.084	1.301	***	.088
Guinea	1.981	***	.077	1.955	***	.082
Kenya	0.912		.078	1.061		.083
Madagascar	1.054		.072	1.092		.078
Niger	1.153	*	.078	1.511	***	.085
Rwanda	0.455	***	.073	0.473	***	.079
Senegal	1.888	***	.074	2.574	***	.080
Constant	2.019	***	.062	0.910	***	.095
-2 Log likelihood	17116.04			15826.29		
Chi-square (sign., df)	2793.50	***	10	4083.25	***	19
N	14984			14984		

Source: WageIndicator face-to-face survey African countries, 2012
**** p<0.01, ** p<0.05; * p<0.10*

4.3.3 Working long hours

According to hypothesis 2c) we expect that a higher degree of informality increases the likelihood of working long hours, here defined as working more than 48 hours a week. Table 4 shows the probablities of working long hours. Indeed, as expected, the odds ratio for informal workers to be working long hours increase almost two times compared to the in-between and formal workers, as the base model shows. When controlled for personal and workplace characteristics, the odds ratio still increases 46 per cent.

The results further reveal that for female workers the odds ratio for working long hours decreases by 34 per cent. In contrast, for young workers the odds ratio increases with 17 per cent compared to workers aged 35 and over. Being a single-headed household does not affect the probability significantly. The odds ratio for the chance to be working long hours decreases by almost 70 per cent for a high-educated worker whereas it increases by 46 per cent for a low-educated worker.

Working in a small enterprise increases the odds ratio for working long hours by 41 per cent. Working in the private sector increases the odds ratio for working long hours even more, notably by 113 per cent. Working in a low status occupation decreases the chance of working long hours: the odds ratio decreases by 22 per cent. Working in a high status occupation does not significantly affects the chance of working long hours.

Compared to workers in the reference country Togo, the odds ratio increases for workers in all other countries. Particularly in Rwanda, folowed by Benin and Ghana, the odds ratio of working long hours increases largely.

Table 4 Parameter estimates of workers' personal and workplace characteristics and country on the likelihood of working more than 48 hours per week (binary logistic regression)

	Base model			Full model		
	Exp(B)	Sig.	S.E.	Exp(B)	Sig.	S.E.
Informal (1/2 on index)	1.966	***	.046	1.462	***	.049
Formality (4/5 on index)	0.455	***	.051	0.542	***	.054
Female				0.743	***	.040
Young (age <35 yrs)				1.172	***	.038
Single headed household				1.023		.063
High education				0.589	***	.050
Low education				1.460	***	.045
Firm size 1-4				1.408	***	.045
Private sector				2.128	***	.043
High status occupation				0.959		.045
Low status occupation				0.823	***	.046
Country (ref: Togo)				0.000	***	.000
Benin	2.301	***	.072	2.224	***	.075
Ghana	2.073	***	.077	1.884	***	.080
Guinea	1.287	***	.070	1.245	***	.073
Kenya	1.427	***	.073	1.468	***	.077
Madagascar	1.078		.069	1.076		.072
Niger	1.494	***	.074	1.259	***	.079
Rwanda	3.787	***	.072	3.680	***	.074
Senegal	1.460	***	.069	1.275	***	.072
Constant	0.580	***	.059	0.328	***	.085
-2 Log likelihood	18937.32			18146.22		
Chi-square (sign., df)	1828.24	***	10	2619.35	***	19
N	14984			14984		

Source: WageIndicator face-to-face survey African countries, 2012
**** p<0.01, ** p<0.05; * p<0.10*

4.3.4 Collective bargaining coverage

According to hypothesis 2d) we expect that a higher degree of informality decreases the likelihood of being covered by a collective bargaining agreement. Note that the number of observations in this analysis are lower, due to the fact that almost 11% of the respondents provded a 'don't know' answer. They were excluded from the analysis. Table 5 shows the probablities of bargaining coverage. Indeed, as expected, the odds ratio for informal workers to be covered decrease almost four times compared to the in-between and formal workers, as the base model shows. When controlled for personal and workplace characteristics, the odds ratio still increases almost three times.

The results further reveal that for female workers the odds ratio for being covered increases by 15 per cent. In contrast, for young workers the odds ratio decreases with 25 per cent compared to workers aged 35 and over. Being a single-headed household does not affect the probability significantly. The odds ratio for the chance to be covered increases by 15 per cent for a high-educated worker whereas it decreases by 27 per cent for a low-educated worker.

Working in a small enterprise decreases the odds ratio for being covered by 76 per cent. Working in the private sector does so by 33 per cent. Working in a high status occupation does not significantly affects the chance of being covered. Working in a low status occupation decreases the chance of for being covered: the odds ratio decreases by 33 per cent.

Compared to workers in the reference country Togo, the odds ratio decreases for workers in all other countries, apart from Rwanda, while the coefficients for Guinea and Niger are not significant.

Table 5 Parameter estimates of workers' personal and workplace characteristics and country on the likelihood of being covered by a collective agreement (binary logistic regression)

	Base model			Full model		
	Exp(B)	Sig.	S.E.	Exp(B)	Sig.	S.E.
Informal (1/2 on index)	0.265	***	.059	0.338	***	.062
Formality (4/5 on index)	2.677	***	.056	2.229	***	.058
Female				1.147	***	.049
Young (age <35 yrs)				0.797	***	.046
Single headed household				0.988		.076
High education				1.152	**	.056
Low education				0.787	***	.061
Firm size 1-4				0.567	***	.049
Private sector				0.750	***	.049
High status occupation				0.930		.053
Low status occupation				0.754	***	.058
Country (ref: Togo)				0.000	***	.000
Benin	0.281	***	.107	0.291	***	.110
Ghana	0.769	***	.088	0.777	***	.091
Guinea	0.952		.084	0.925		.088
Kenya	0.676	***	.086	0.705	***	.089
Madagascar	0.220	***	.098	0.204	***	.100
Niger	0.921		.092	1.033		.096
Rwanda	1.105		.081	1.152	*	.083
Senegal	0.586	***	.086	0.620	***	.089
Constant	0.694	***	.069	1.483	***	.096
-2 Log likelihood	12946.16			12638.29		
Chi-square (sign., df)	3088.99	***	10	3396.86	***	19
N	13336			13336		

Source: WageIndicator face-to-face survey African countries, 2012
**** p<0.01, ** p<0.05; * p<0.10*

5 Conclusions

Who has an informal job and how is that job paid? These two research objectives are central to this paper, focussing on nine sub-Saharan African countries, notably Benin, Ghana, Guinea, Kenya, Madagascar, Niger, Rwanda, Senegal, and Togo. What are the socio-demographic and workplace characteristics of informal workers? Which labour market outcomes are related to informal work, especially with respect to wages, pay below the minimum wage level, working hours, and collectve bargaining coverage? Using data of comparable face-to-face surveys on work and wages in these nine, one hypothesis concerning the characteristics of informal workers and four hypothesis concerning the labour market outcomes have been investigated. For all nine surveys, the sampling frame is drawn from national establishment registers, hence the survey addresses formal and informal workers in registered, thus formal, enterprises, thereby following Luebker's concept of job-based informality (Luebker, 2008).

A five-points informality-index is developed, based on three dimensions: contributing to social security, being entitled to social security and having an employment contract. Unweighted across countries, half of the workers in formal enterprises are in the two most informal categories of the index, one fifth of workers is placed in the midst, while almost one third is in the two most formal categories. In all countries, the young and low-educated workers have the lowest scores on the informality index. The effects of gender and households, however, are smaller and not unidirectional across countries. The effects are confirmed for the workplace characteristics micro enterprises, private industry and low occupational status. The country dummies show that national differences do exist and that all countries are significantly different from the reference country Togo, except Ghana and Rwanda in the informal model and Benin in the formal model.

The effects of informatility on labour market outcomes show that the workers' score on the informality scale strongly and significantly affect their wages, also when controlled for their personal and workplace characteristics: the more formal the job, the higher the wages, and the higher the chance to be paid above the relevant minimum wage level or the poverty line. In addition, the more formal the job, the lower the chance of working more than 48 hours per week and the higher the chance not being covered by a collective agreement. The country dummies show that national differences do exist, but no overarching pattern could be traced. In Senegal earnings are highest and in Madagascar they are lowest. In Rwanda the chances of being paid below the national poverty line and of working more than 48 hours are largest.

We explored country-level indices for explaining aggregate variation, but we did not elaborate any directed hypotheses on the aggregate country level for four reasons. Firstly, while a large body of research already exists, previous work has predominantly operated under a different, sector-based definition of informal employment. This has led to the use of indicators like the level of urbanisation, that equate agricultural work with informal work and are unhelpful for our analysis of job-based informality in registered enterprises. Secondly, the effects of labour market institutions remain contentious. Thirdly, the country level variation in our dataset containing only nine sub-Saharan African countries, is relatively small. Fourthly, available aggregate data proved insufficiently reliable in various tests. A close inspection of available aggregate measures failed to inspire confidence that their inclusion in the analysis would improve the models, therefore control for all country level effects by introducing dummies to the models and clustering standard errors.

Abbreviations

HDI	Human Development Index
ILO	International Labour Organization
ISCED	International Standard Classification of Educations
ISCO	International Standard Classification of Occupations
WTO	World Trade Organisation

PPP	Purchasing Power Parity
UNESCO	United Nations Educational, Scientific and Cultural Organization
USD	US Dollar

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Appendix

Table 6 The three informality dimensions and nr. of observations within each cell in the index

Contributes to social security	Entitled to social security	Kind of employment contract	1 Very informal	2	3	4	5 Very formal	%
No	No	No contract	2812	0	0	0	0	18%
No	No	Self-employed	2482	0	0	0	0	16%
No	No	Empl. fixed-term contract	0	1714	0	0	0	11%
No	No	Empl. permanent contract	0	823	0	0	0	5%
Yes	No	Empl. permanent contract	0	0	737	0	0	5%
Yes	No	Empl. fixed-term contract	0	0	590	0	0	4%
No	Yes	Empl. permanent contract	0	0	367	0	0	2%
No	Yes	Empl. fixed-term contract	0	0	304	0	0	2%
Yes	No	No contract	0	0	239	0	0	2%
Yes	No	Self-employed	0	0	217	0	0	1%
No	Yes	Self-employed	0	0	209	0	0	1%
No	Yes	No contract	0	0	177	0	0	1%
Yes	Yes	No contract	0	0	146	0	0	1%
Yes	Yes	Empl. fixed-term contract	0	0	0	1257	0	8%
Yes	Yes	Self-employed	0	0	0	150	0	1%
Yes	Yes	Empl. permanent contract	0	0	0	0	3196	21%
								100%

Source: WageIndicator face-to-face survey African countries, 2012, unweighted data (N=15,420)

Table 7 Means, standard deviations and nr. of observations of the informality index in nine countries

	Mean	Std. Deviation	N
Benin	2.08	1.277	1725
Ghana	3.51	1.652	1369
Guinea	2.70	1.431	1826
Kenya	3.02	1.439	1508
Madagascar	2.45	1.649	1921
Niger	2.60	1.295	1378
Rwanda	2.65	1.575	1912
Senegal	2.44	1.533	1841
Togo	2.68	1.456	1940
Total (unw.)	2.65	1.529	15420

Source: WageIndicator face-to-face survey African countries, 2012 (N=15,420)

Table 8 Mean values of the informality index for four personal variables in nine countries

Informal index	Male	Female	24 or yr	25 - 34	35 - 44	45 - 54	55 +	Low education	Middle education	High education	No single h. hh.	Single headed househ.
Benin	2.10	2.06	1.68	2.08	2.28	2.67	2.35	1.49	2.24	3.03	2.09	2.04
Ghana	3.44	3.63	2.58	3.47	3.54	3.95	3.79	2.43	3.69	4.61	3.51	3.50
Guinea	2.70	2.70	1.68	2.53	2.83	3.11	3.34	3.03	2.28	2.85	2.68	2.90
Kenya	2.99	3.08	2.18	2.90	3.27	3.44	3.03	1.91	2.93	4.32	3.02	3.06
Madagascar	2.45	2.45	1.83	2.44	2.54	2.69	2.24	1.56	2.28	3.37	2.46	2.32
Niger	2.57	2.72	2.03	2.47	2.87	3.05	2.55	2.11	2.85	3.31	2.57	2.86
Rwanda	2.65	2.65	1.83	2.85	2.77	2.66	2.77	1.59	2.53	3.66	2.71	2.07
Senegal	2.47	2.34	1.56	2.31	2.70	2.88	2.52	1.49	2.72	3.62	2.50	2.05
Togo	2.80	2.47	1.96	2.37	3.15	3.75	3.96	1.72	2.52	3.59	2.72	2.44

Source: WageIndicator face-to-face survey African countries, 2012 (N=15,420)

Table 9 Mean values of the informality index for five workplace variables in nine countries

Informal index	Employee	Self-employed	No covered	Covered	Firmsize >4 empl	Firmsize <4 empl	Public sector	Private sector	Low status	Mid status	High status
Benin	2.35	1.23	1.93	3.57	2.67	1.39	2.23	2.01	1.87	2.06	2.31
Ghana	3.91	1.42	2.79	4.64	3.93	1.90	3.82	3.35	3.17	3.20	4.15
Guinea	3.09	1.35	2.40	3.40	3.14	1.62	3.32	2.41	2.14	2.85	2.91
Kenya	3.05	1.80	2.65	3.85	3.50	2.27	3.69	2.64	2.58	3.02	4.00
Madagascar	3.19	1.15	2.31	3.49	3.26	1.46	3.50	2.16	1.82	2.89	2.77
Niger	2.91	1.95	2.38	3.18	3.02	2.15	3.16	2.31	2.34	2.65	2.75
Rwanda	3.05	1.54	2.10	3.64	3.18	1.67	2.64	2.65	2.12	2.62	3.10
Senegal	2.59	1.38	2.05	3.78	2.89	1.61	3.32	2.19	2.05	2.58	2.73
Togo	2.74	1.60	2.22	3.75	3.06	1.89	3.69	2.29	2.09	3.16	2.94

Source: WageIndicator face-to-face survey African countries, 2012 (N=15,420)

Table 10 Means, standard dev., skewness and nr. of observations of net hourly wages in standardised USD in nine countries

	Mean	Std. Deviation	Skewness	N
Benin	1.44	1.90	3.83	1629
Ghana	2.64	2.77	1.74	1315
Guinea	1.98	2.44	3.30	1700
Kenya	1.39	1.75	4.54	1483
Madagascar	1.24	1.70	4.09	1814
Niger	1.69	2.07	2.84	1339
Rwanda	2.47	2.94	2.02	1862
Senegal	2.20	2.51	2.66	1800
Togo	1.63	2.05	2.94	1890
Total (unw.)	1.85	2.32	2.88	14832

Source: WageIndicator face-to-face survey African countries, 2012 (N=15,420)

Table 11 Means, standard dev. and nr. of observations of those earning above the relevant minimum wage or poverty line in nine countries

	Mean	Std. Deviation	N
Benin	0.66	0.47	1725
Ghana	0.69	0.46	1341
Guinea	0.72	0.45	1826
Kenya	0.61	0.49	1493
Madagascar	0.58	0.49	1909
Niger	0.62	0.48	1378
Rwanda	0.44	0.50	1912
Senegal	0.70	0.46	1825
Togo	0.58	0.49	1939
Total (unw.)	0.62	0.49	15348

Source: WageIndicator face-to-face survey African countries, 2012

Table 12 Means, standard dev. and nr. of observations for working 48 hours or more in nine countries

	Mean	Std. Deviation	N
Benin	0.65	0.48	1725
Ghana	0.49	0.50	1369
Guinea	0.46	0.50	1826
Kenya	0.45	0.50	1496
Madagascar	0.44	0.50	1916
Niger	0.49	0.50	1378
Rwanda	0.68	0.47	1912
Senegal	0.50	0.50	1841
Togo	0.41	0.49	1940
Total (unw.)	0.51	0.50	15403

Source: WageIndicator face-to-face survey African countries, 2012

Table 13 The national minimum wages or poverty lines in the nine countries

Country	Code	Currency	Amount	Period	Industries/Occupation	Region	Type
Benin	204	BIN CAF Franc (XOF)	31652.00	Month	All	All	MW
Ghana	288	GHS Ghanaian Cedi	4.48	Day of 8 hrs	All	All	MW
Guinea	324	GNF Guinean franc	400000.00	Month	All	All	Poverty line
Kenya	404	KES Kenyan shilling	158.10	Day	Unskilled employee	Cities of Nairobi, Mombasa and Kisumu	MW
Kenya	404	KES Kenyan shilling	163.70	Day	House servant or cook	Cities of Nairobi, Mombasa and Kisumu	MW
Kenya	404	KES Kenyan shilling	191.30	Day	Farm artisan	Cities of Nairobi, Mombasa and Kisumu	MW
Kenya	404	KES Kenyan shilling	205.15	Day	General labourer	All other areas	MW
Kenya	404	KES Kenyan shilling	233.90	Day	Lorry driver or car driver	Cities of Nairobi, Mombasa and Kisumu	MW
Kenya	404	KES Kenyan shilling	313.20	Day	Machine attendant	All other areas	MW
Kenya	404	KES Kenyan shilling	335.40	Day	General labourer	Eldoret, Kitale, Nakuru, Thika Municipalities, and Urban councils	MW
Kenya	404	KES Kenyan shilling	364.95	Day	General labourer	Cities of Nairobi, Mombasa and Kisumu	MW
Kenya	404	KES Kenyan shilling	375.30	Day	Ungraded artisan	All other areas	MW
Kenya	404	KES Kenyan shilling	386.95	Day	Machine attendant	Eldoret, Kitale, Nakuru, Thika Municipalities, and Urban councils	MW
Kenya	404	KES Kenyan shilling	413.10	Day	Machine attendant	Cities of Nairobi, Mombasa and Kisumu	MW
Kenya	404	KES Kenyan shilling	454.15	Day	Ungraded artisan	Eldoret, Kitale, Nakuru, Thika Municipalities, and Urban councils	MW
Kenya	404	KES Kenyan shilling	492.40	Day	Ungraded artisan	Cities of Nairobi, Mombasa and Kisumu	MW
Kenya	404	KES Kenyan shilling	515.30	Day	Tailor, driver (medium-sized vehicle)	All other areas	MW
Kenya	404	KES Kenyan shilling	570.05	Day	Tailor, driver (medium-sized vehicle)	Eldoret, Kitale, Nakuru, Thika Municipalities, and Urban councils	MW
Kenya	404	KES Kenyan shilling	619.75	Day	Tailor, driver (medium-sized vehicle)	Cities of Nairobi, Mombasa and Kisumu	MW
Kenya	404	KES Kenyan shilling	657.85	Day	Saw doctor, caretaker (buildings)	All other areas	MW
Kenya	404	KES Kenyan shilling	707.35	Day	Saw doctor, caretaker (buildings)	Eldoret, Kitale, Nakuru, Thika Municipalities, and Urban councils	MW
Kenya	404	KES Kenyan shilling	726.00	Day	Cashier, driver (heavy vehicle), salesman- driver	All other areas	MW
Kenya	404	KES Kenyan shilling	757.60	Day	Saw doctor, caretaker (buildings)	Cities of Nairobi, Mombasa and Kisumu	MW
Kenya	404	KES Kenyan shilling	775.15	Day	Cashier, driver (heavy vehicle), salesman- driver	Eldoret, Kitale, Nakuru, Thika Municipalities, and Urban councils	MW
Kenya	404	KES Kenyan shilling	824.20	Day	Cashier, driver (heavy	Cities of Nairobi, Mombasa and Kisumu	MW

Country	Code	Currency	Amount	Period	Industries/Occupation	Region	Type
					vehicle), salesman- driver		
Madagascar	450	MGA Malagasy ariary	507.02	Hour	Agriculture	All	MW
Madagascar	450	MGA Malagasy ariary	577.00	Hour	Non-agriculture	All	MW
Niger	562	NER CAF Franc (XOF)	30047.00	Month	All	All	MW
Rwanda	646	RWF Rwandan franc	118000.00	Month	All	All	Poverty line
Senegal	686	SEN CAF Franc (XOF)	182.95	Hour	Agriculture	All	MW
Senegal	686	SEN CAF Franc (XOF)	209.10	Hour	Non-agriculture	All	MW
Togo	768	CFA Togo Franc	35000.00	Month	All	All	MW

Source: WageIndicator minimum wage webpages 2012