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Ethnic Diversity and Informal Work in Ghana

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ABSTRACT *We present the first study that examines the effects of ethnic diversity on informal work. Using two waves of data from the Ghana Socioeconomic Panel Survey, we find that ethnic diversity is associated with a higher probability of engaging in informal work. Specifically, our instrumental variable estimates suggest that a unit increase in ethnic diversity is associated with up to a 16.7 percentage point increase in the probability of engaging in informal work. This result is robust to alternative estimation approaches and alternative ways of measuring ethnic diversity. Our results also show that trust, which is lower in ethnically diverse neighbourhoods, is an important channel through which ethnic diversity operates to increase the probability of engaging in informal work. Our results point to the need for policies that promote trust between diverse ethnic groups in heterogeneous societies.*

KEYWORDS: Ethnic diversity; informal work; informality; trust; Ghana

1. Introduction

In the classical study of informality, De Soto (1989) describes informality as the collection of economic agents (including firms and workers) and activities that operate outside the regulatory and legal framework of a country. Such economic agents, operating in the informal sector, fail to comply with labour market statutes, as well as avoiding regulation and the burden of taxation. However, they do not fully enjoy the benefits of the formal sector, including potential state benefits derived from regulation (Loayza, Servén, & Sugawara, 2009). Evidence suggests that formal workers tend to enjoy higher wages, pension, and employment security and longer vacation, while informal workers are often engaged in labour-intensive activities in either small firms or self-employment without protected benefits or job security (de Almeida, Alves, & Graham, 1995; Maloney, 1999).

A significant part of economic activity in both developed and developing countries occurs in the informal sector, thus providing livelihoods for billions of people globally (La Porta & Shleifer, 2014). Since the 1970s, the informal economy and its role in the development process have been widely debated (see, e.g. De Soto, 1989; Gërkhani, 2004; Schneider & Enste, 2000). On the one hand, the informal economy is seen as a pool of entrepreneurial talent that provides livelihoods for the poor. In this view, relaxing entry requirements and enhancing institutions to fuel informality is expected to promote economic development (De Soto, 1989; Hart, 1973).

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On the other hand, the informal economy has been viewed as problematic, with arguments suggesting that many economic agents within the informal sector deliberately avoid formal registration to evade taxes, thus hindering development (Chen, Vanek, & Heintz, 2006). A related strand of literature entrenched in the classical views of economic development considers informality as an outcome. Here, informality is seen as a by-product of poor economic performance and poverty, and thus an increase in economic growth is expected to reduce the size of the informal economy (Rauch, 1991).

Despite sustained growth in many developing countries, the prevalence of unproductive informal sectors is on the rise (Kanbur, 2017), and informal workers tend to be disproportionately poor (Maloney, 2004). Policy-makers are therefore concerned about the growth of the informal sector. A first step to addressing the issue of unproductive informal sectors is improved understanding of the root causes of this lack of productivity.

At the same time as informality is growing globally (especially in developing countries), local communities across the globe are becoming more ethnically diverse. Thus, sitting alongside the literature on the determinants of informality, there is a growing body of literature that seeks to understand the role of an important sociocultural factor such as ethnic diversity in shaping social, institutional, and economic outcomes including poverty, inequality, economic growth (see, e.g. Awaworyi Churchill & Smyth, 2017; Easterly & Levine, 1997; Leigh, 2006), innovation (see, e.g. Fafchamps, 2000), entrepreneurship, wages, and productivity (see, e.g. Awaworyi Churchill, 2017a), among others. However, to date, no study has examined the effect of ethnic diversity on informal work. We fill an important gap in the literature by providing the first study that examines how ethnic diversity influences informal work using panel data for Ghana.

Ethnic diversity reflects the heterogeneity between people of different ethnic groups that exist in a society or community, and thus, it captures the level of ethnic concentration or divide of ethnic groups in a given geographic area (Awaworyi Churchill & Smyth, 2017; Greenberg, 1956). While various dimensions of ethnic diversity have been discussed in the literature, fractionalization remains one of the basic constructs of ethnic diversity, and thus, from this perspective, ethnic diversity captures the probability that two randomly selected individuals from a given geographic area are from different ethnic groups (Greenberg, 1956).

Using data from two waves of the Ghana Socioeconomic Panel Survey, we measure ethnic diversity at the district level and examine the impact of ethnic diversity on various measures of informal work. Specifically, we focus on the distinction between wage employment and self-employment in the informal sector, and we examine informal work along both dimensions separately and also together. Our results suggest that ethnic diversity is associated with a higher probability of engaging in informal work. This finding is robust to various estimation methods and alternative ways of measuring ethnic diversity. We also find that trust is a channel through which ethnic diversity influences informal work.

Ghana makes an interesting case study in examining the effects of ethnic diversity on informal work for at least two reasons. First, Ghana has a large informal sector, with about 80 per cent of the labour force engaged in informal work. The informal sector in Ghana is often traced back to the onset of colonial capitalism in what was then called the Gold Coast, where a defining feature of the labour market was an informal economy characterized by peasant farming and trade (Osei-Boateng & Ampratwum, 2011). Over time, the informal economy has expanded into rural and urban areas, significantly contributing to the labour force. Second, as an African country, Ghana makes for an important case study in examining the dynamics of ethnic diversity. Evidence suggests that the most ethnically diverse continent in the world is Africa, and that it hosts some of the most diverse countries in the world (see Fearon, 2003). Fearon (2003) reports an ethnic fractionalization score of 0.846 for Ghana, making it one of the most ethnically diverse countries in the world, ahead of all countries in Europe, Asia, the Middle East, and Latin America and the Caribbean. Additionally, with a fractionalization score of 0.846, Ghana is more ethnically diverse than most countries in Africa with only 11 countries ahead of Ghana.

Notably, Ghana is more ethnically diverse than Nigeria, which is well-known as a very diverse country globally.

The remainder of the study is structured as follows. The next section provides an overview of how ethnic diversity might affect informal work. Section 3 discusses the data and variables, while Section 4 presents the empirical methods. Section 5 presents the results, while Section 6 concludes.

2. Why should ethnic diversity affect informal work?

Conceptually, the impact of ethnic diversity on informality could be positive (increase the probability of informality) or negative (decrease the probability of informality), depending on the channels through which diversity operates to influence informality. In this section, we discuss how ethnic diversity is linked to various factors, and how this consequently influences informal work.

2.1. Entrepreneurship and innovation

Differences across ethnic groups can explain differential economic outcomes, including labour market outcomes. Along these lines, ethnic groups are known to be endowed with different cultural and social institutions that can influence entrepreneurial talent and labour market opportunities available in an area (Awaworyi Churchill, 2017b). Related to this, the existing literature argues that ethnic diversity promotes innovation (Fafchamps, 2000).

Innovation thus serves as a channel linking ethnic diversity with informality. Specifically, early theoretical work on innovation and firm survival suggests that firm survival depends on innovation, and that firms that are able to innovate tend to survive and grow, while those that do not innovate tend to fail (Jovanovic, 1982). In addition, for new entrants, innovation is likely to impact on entrepreneurial decisions to operate informally or formally. Further, informal firms that are innovative are able to transition into the formal economy (ILO, 2002). Thus, ethnic diversity, via its effects on innovation, is able to shape the dynamics of informal work by influencing: (1) entrepreneurial decisions to operate informally or formally, (2) the survival of firms in the informal sector, and (3) the transition of firms from the informal to the formal sector.

2.2. Discrimination

Ethnic diversity has been associated with discrimination, including discrimination in labour markets, with groups that suffer or perpetuate discrimination losing financially in the labour market (Awaworyi Churchill, 2017b). For instance, the existence of several (or multiple) ethnic groups in a society tends to engender an inherent hierarchical structure conserved within the norms of society over time, which projects one ethnic group as superior over others. This hierarchical structure induces categorizations (e.g. ethnic minority vs ethnic majority) that are typical in ethnically diverse communities and causes economic and labour market disadvantages. This leaves ethnic minorities often discriminated against, lacking opportunities, and relatively disadvantaged. Awaworyi Churchill (2017b) also argues that ethnic diversity tends to promote labour force discrimination, which influences wages and productivity. This could influence informality indirectly, or even more directly, when, as a result of labour force discrimination, certain groups or individuals are cut off from the formal labour market and forced into informal employment. In a model of discrimination, Becker (1957) shows that discrimination tends to lower profits, and thus firms that are more unprejudiced and open-minded force firms that discriminate out of the labour market. This influences the concentration of labour market opportunities and, thus, the employment choices available to economic agents.

2.3. *Trust, institutions, and macroeconomic policies*

A large body of literature has linked trust to ethnic diversity, and to several socioeconomic outcomes. Perhaps the most salient channel through which ethnic diversity could influence informal work is trust, which has been linked to outcomes such as institutional quality, income poverty, entrepreneurship, social capital, innovation, the provision of public goods, productivity, and wages, all of which play important roles in determining the levels of informality.

Ethnic diversity has been shown to erode trust and social networks in society, consequently promoting several undesirable effects on society (see, e.g. Leigh, 2006). Previous discussions shed light on the role of social capital and networks as resource that promotes entrepreneurship. Weaker networks, on the other hand, result in weaker collective action (Miguel, 2006), including collective action on formalizing existing business ventures. Here, it is argued that trust is relevant for maintaining strong social networks that promote cohesion, an important component of collective action. With lower levels of trust, individuals find it difficult to reach an agreement on a common good, given that they are less able to resolve their differences and collective-action problems.

From a related perspective, informal social institutions such as trust have been shown to be important in shaping formal institutions, influencing economic transaction, and enforcing contracts (Alesina & Zhuravskaya, 2011; Awaworyi Churchill, 2017a). Arrow (1972) provides a very useful summary that emphasizes the role and importance of trust in every economic transaction. Specifically, Arrow (1972, p. 357) notes that ‘virtually every commercial transaction has within itself an element of trust, certainly any transaction conducted over a period of time. It can be plausibly argued that much of the economic backwardness in the world can be explained by the lack of mutual confidence’. Poor economic and institutional outcomes have therefore been attributed to lack of mutual confidence and trust in economic agents. Awaworyi Churchill (2017a) finds evidence to suggest that higher diversity (via its effect on trust) lowers new business density and increases the costs of contract enforcement and the bureaucratic burden associated with new business registration and formalization, thus promoting informality. Thus, while trust may be relevant for both the informal and formal sectors to flourish, one can expect that lack of trust would push more individuals towards the informal sector given increased costs of contract enforcement and the bureaucratic burdens associated with formalization. However, the opposite is unlikely to happen, and thus we expect that, low levels of trust would lead to more informality.

Ethnic diversity could also influence informality via its effect on economic policy-making. Ethnic diversity has been shown to influence standard indicators of economic policy-making, which tend to influence policy in the area of informal work and are thus likely to shape the dynamics of informal work. In particular, ethnic diversity has been shown to influence public policies relating to government expenditures, tax compliance, education, institutions, and financial development, among others, all of which determine the size of the informal economy (see, e.g. Alesina & Zhuravskaya, 2011; Easterly & Levine, 1997). For instance, financial development can promote informality by lowering the barriers to credit access. At the same time, financial development is likely to increase the opportunity cost of operating in the informal economy, thus providing incentives for firms to transition to the formal sector (Capasso & Jappelli, 2013). As another example, ethnic diversity decreases tax compliance, and thus, in order to avoid taxes, entrepreneurs are more likely to operate in the informal market, thereby contributing to larger informal sectors (Lassen 2007).

The preceding discussions suggest that ethnic diversity is likely to influence the dynamics of informal work via its effect on trust in two distinct and contrasting ways. First, when privileged information about economic and income-earning opportunities exists, such information is likely to circulate more effectively among social networks, and thus in the absence of trust formal economic opportunities can be lost, which contributes to the prevalence of informality. Second, the lack, or failure, of informal institutions such as trust, which has been associated with poorer economic outcomes, can induce greater demand for formal institutions. Such formal institutions are often characterized by strict laws and regulations that do not create room for a thriving informal sector, thus leading to

less informality. In addition, ethnic diversity is linked with several policies that are likely to promote or hinder the informal sector depending on the specific policy channel.

2.4. Conflict and crime

Ethnic diversity has also been linked with social disorganization that promotes conflict and crime (see, e.g. Awaworyi Churchill & Laryea, 2019). The argument here suggests that inequality in ethnically diverse communities tends to engender frustration, anger, and antisocial behaviour that culminates in crime and conflict. The prevalence of conflict and crime creates an environment that serves as a disincentive for new business growth and/or registration. In contrast, some studies argue that ethnic diversity (i.e. fractionalization) could reduce the risk of crime and conflict, and rather that ethnic polarization is a greater issue (see, e.g. Collier, 2001). Ethnic polarization is higher when large ethnic groups dominate. Collier (2001, p. 129) notes that ‘both theoretically and empirically fractionalization actually makes societies safer, while dominance increases the risk of conflict’. Fractionalization has also been found to be unproblematic in an environment characterized by good institutions. For instance, Collier (2001) shows that ethnic diversity could have negative implications in dictatorships but not in democracies. Thus, diversity is likely to influence the dynamics of informality either positively or negatively.

3. Data and variables

We use two waves of data from the Ghana Socioeconomic Panel Survey (GSPS). The GSPS is a collaboration between the Institute of Statistical, Social and Economic Research (ISSER) of the University of Ghana and the Economic Growth Center (EGC), Yale University, which is designed to monitor economic conditions and living standards in Ghana over time (Aryeetey, Osei-Akoto, Darko-Osei, & Udry, 2011). The survey is both nationally representative and regionally representative for the ten regions of Ghana. It uses a two-staged stratified sample design; as part of the sampling process, enumeration areas across the regions in Ghana were randomly selected proportional to the 2009 regional population estimates, and then households were randomly selected from each enumeration area. The first wave of the GSPS, conducted in 2009 and 2010, sampled just over 5,000 households with close to 19,000 individuals, while the second wave, conducted in 2013 and 2014, sampled 4,774 households with over 16,000 individuals. The survey provides data on the demographic characteristics, health, education, and other relevant socioeconomic details of households and their constituent members. Our study restricts the sample to respondents within the prime working age range of 15–65 years.

To generate indices of ethnic diversity, we use data from the 2010 Population and Housing Census (Ghana Statistical Service, 2014), which is the closest to the dates the GSPS surveys were conducted.

3.1. Ethnic diversity

Ethnic diversity is measured at the district level based on data from the 2010 Ghana Population and Housing Census using the Herfindahl fractionalization index (Greenberg, 1956). Where n_{ij} is the share of ethnic group i in district j , indices of diversity are calculated using the Herfindahl formula as follows:

$$ETHNIC\ DIVERSITY_j = 1 - \sum_{i=1}^i n_{ij}^2$$

This index of ethnic diversity (in this case ethnic fractionalization) measures the probability that two randomly selected individuals in a given district belong to different ethnic groups, and an increase in the index of fractionalization indicates an increase in diversity (Alesina, Devleeschauwer, Easterly, Kurlat, & Wacziarg, 2003). We calculate ethnic diversity based on the ethnicity reported in the 2010 Ghana Population and Housing Census. The census provides detailed information on respondents' ethnic groups including 67 ethnic groups across 216 districts. The census also provides information on the district within which each respondent lives. This district (location) information on each respondent provides a precise geographical identifier, which we use to calculate district-level ethnic diversity measures across Ghana. We merge this with the GPS data. We also follow the literature that uses religious classifications and examine the sensitivity of our results to religious diversity.

In robustness checks, as an alternative to the ethnic fractionalization index, we also use the index of ethnic polarization. Where n_{ij} is as defined previously, we calculate indices of ethnic polarization using the approach in Montalvo and Reynal-Querol (2005), which is as follows:

$$ETHNIC\ POLARIZATION = 1 - \sum_{i=1}^i \left(\frac{0.5 - n_{ij}}{0.5} \right)^2 \cdot n_{ij}$$

The index of ethnic polarization captures the conflict dimension of ethnic diversity and thus measures the distance between any distribution of ethnic group that leads to maximum conflict. The extent of polarization depends only on the size of ethnic groups, given that distances are assumed to be equal among groups. Thus, in the context of our analysis, the closer the distribution of ethnic groups in a district, the higher the index of ethnic polarization.

3.2. Informal work

Our measures of informal work are consistent with Danquah et al. (2020)', who construct measures of informal work following the definition proposed by the International Labour Organization (ILO). Informal work is defined as 'all remunerative work (i.e. both self-employment and wage employment), that is not registered, regulated or protected by existing legal or regulatory frameworks, as well as non-remunerative work undertaken in an income-producing enterprise' (ILO 2019). Danquah et al. (2020) identify eight employment types, distinguishing between formal and informal employment as well as wage and self-employment. They first distinguish between wage employment and self-employment and then further categorize these employment types into formal and informal work. Among wage workers, formality status is determined using information on social security contributions, and thus wage workers are considered formal workers if social security contributions are withheld from their salaries, and informal workers if not. The formality status of self-employed workers is determined by the nature of the enterprise. Here, self-employed workers operating a business that is officially registered with the relevant authorities are classified as in formal employment. Danquah et al. (2020) further divide informal employment into upper-tier and lower-tier, with the aim of capturing important structural components of the labour market that are peculiar to Sub-Saharan Africa. However, given data constraints, we are not able to use these subdivisions.

Our study thus focuses on three measures of informal work. The first is a binary variable which is equal to 1 if a respondent is engaged in informal work (either wage employment or self-employed), and 0 otherwise. The second and third measures focus on the nature of employment (i.e. wage or self-employment). Thus, the second measure is a binary variable set equal to 1 if a respondent is engaged in informal wage employment as per the definition above, while the third is a binary variable set equal to 1 if a respondent is engaged in informal self-employment.

3.3. Covariates

We include a standard set of covariates consistent with the literature on labour market outcomes. Specifically, we control for age and its quadratic term, gender, geographic location (i.e. urban vs rural), education, and marital status.

3.4. Summary and descriptive statistics

Table A1 in the Appendix provides a summary and description of variables included in our analysis. The mean of ethnic fractionalization across the Ghanaian districts is 0.618, which is consistent with those reported in other studies (see, e.g. Alesina et al., 2003; Koomson & Churchill, 2021). Ethnic polarization is relatively lower at 0.579 while religious fractionalization is higher at 0.735. Across our sample about 22% are engaged in informal work, 8% of which engage in informal wage employment while 15% engage in informal self-employment. The average respondent is 35 years old with 46% being male and 54% female.

4. Empirical specification

We employ a panel probit model in which the binary outcome variable denoting informal work is regressed on ethnic diversity and a vector of covariates:

$$INF_{ijt} = \beta_1 ED_j + \beta_2 ED_j^2 + \sum_n \beta_n X_{n,it} + \alpha_s + \mu_t + \varepsilon_{ijt}$$

where INF is the measure of informal work for individual i in district j at time t . ED is the measure of ethnic diversity for district j , while X is a set of individual characteristics correlated with informal work. α_s captures regional fixed effects, μ_t represents time fixed effects, and ε is the error term. Given that labour market outcomes tend to be persistent, especially over short periods of time, and that our measure of ethnic diversity is time-invariant, we do not estimate an individual fixed-effect model. Thus, our baseline results are estimated using a panel probit model that controls for time and region fixed effects. We also conduct a wave-by-wave analysis in which we conduct a probit analysis for Wave 1 and Wave 2 separately.

To ensure our results are robust to endogeneity which may arise due to measurement error or omitted-variable bias, we also adopt an instrumental variable (IV) probit model. Measurement error is a common issue in empirical analysis and occurs when the measured value of a variable deviates from the true value. This is typical in survey data like ours when respondents provide biased responses. For instance, in the case of ethnicities in Ghana, there are several sub-groups of the Akan ethnic group, which could be wrongly reported by respondents. Additionally, omitted variable bias is likely to be a problem given that we are unable to control for or observe all the factors that are likely to be correlated with ethnic diversity and informality. For instance, in regressions focused on informal self-employment, we are unable to control for access to credit or finance because of issues relating to data availability. Omitted variable bias and measurement error could result in either upward (overestimation) or downward (underestimation) bias of the coefficient on ethnic diversity. Given the several potential variables some of which are unobservable and unknown, on the balance, the overall direction of bias (i.e. upward or downward) cannot be determined *a priori*.

Consistent with the literature, we instrument ethnic diversity at the district level using a regional-level measure of ethnic diversity based on older population census information (Akay, Constant, Giulietti, & Guzi, 2017; Awaworyi Churchill et al. 2019). The existing literature has demonstrated that measures of ethnic diversity drawn from older censuses operate like lags and serve as good instruments, especially if the instrument is derived from a much older census (Dustmann, Fabbri, & Preston, 2005). Put differently, the older the census year from which the

instrument is derived, the stronger the instrument will be. This ensures that potential selection into locations that predates the census is adequately controlled for (Glennester, Miguel, & Rothenberg, 2013).

The exclusion restriction is that historical or older measures of ethnic diversity (which operate like lags) should affect current diversity but should not be correlated with unobserved factors that influence current labour market outcomes. Specifically, in our case, we use information from the 2000 Ghanaian population census (Ghana Statistical Service, 2002), which is the oldest census information available to us, to generate indices of ethnic diversity at the regional level. Geographic patterns in a region will reflect the patterns of districts or other smaller geographic areas within that region, and thus historic regional-level diversity should be correlated with district-level diversity. However, regional diversity from a decade preceding the earliest GSPS (i.e. 2009/10) should not influence current labour market status. Moreover, the use of the historic regional-level diversity measure as an instrument has the dual advantage of addressing potential selection bias as well as reducing the severity of endogeneity. Although location decisions are endogenous when small and concentrated geographic areas are considered (e.g. the district level in our case), Dustmann and Preston (2001) demonstrate that the severity of endogeneity decreases with the geographic size of the area. Thus, by instrumenting ethnic diversity at a lower geographic area (i.e. district level) with a measure of ethnic diversity from a higher (and broader) geographic area (i.e. regional level), we ensure that the strongest possible instrument is used.

A possible limitation of our instrument is that it is drawn from a census that does not go back far enough. As Dustmann et al. (2005) demonstrate, the instrument is stronger if it is drawn from a much older census. However, in our case the census information that is available to us only dates back to 2000, and thus persistence may be an issue. Thus, for robustness, we also use the Lewbel (2012) two-stage least squares (2SLS) approach and propensity score matching (PSM). Lewbel (2012) proposes an approach that relies on heteroscedasticity in the data to achieve identification and establish causality. This method provides the advantage of not relying on an exclusion restriction (Lewbel, 2012).

We adopt PSM to determine the average effect of the treatment (in our case individuals who live in ethnically homogeneous districts) on our outcome variable (informal work). To help draw causal inferences about the effect of ethnic diversity on informal work using PSM, we ask the question: what is the outcome (in terms of informal work status) for respondent i who is treated (i.e. lives in an ethnically homogeneous district) relative to the hypothetical outcome that would have prevailed if the same respondent lived in a heterogeneous district? We apply the Rosenbaum and Rubin (1983) technique, and adopt the nearest neighbour, radius, and kernel matching methods. Consistent with the literature, we consider districts with a fractionalization index of at least 0.5 as ethnically heterogeneous and those below 0.5 as homogeneous (see, e.g. Awaworyi Churchill et al., 2019). Thus, we code a dummy variable (homogeneous: 1, heterogeneous: 0) which we use in PSM. However, in robustness checks we also consider the mean of ethnic diversity as the threshold and consider those below and above as ethnically homogeneous and heterogeneous, respectively.

5. Results

Table 1 reports baseline results for the effects of ethnic diversity on informal work. Panels A, B, and C report results using data from Wave 1, Wave 2, and Waves 1 and 2 of the GSPS, respectively. In Columns 1 and 2, we report results for effects on informal work without distinction between the type of employment. In Columns 3 and 4 we report results for informal wage employment, while Columns 5 and 6 report results for informal self-employment. Estimates reported in Columns 1, 3, and 5 are drawn from regressions without control variables, while those reported in Columns 2, 4, and 6 include the standard set of covariates.

Table 1. Ethnic diversity and informal work (baseline results)

	(1)	(2)	(3)	(4)	(5)	(6)
Variables	Informal work		Informal work (wage employment)		Informal work (self-employment)	
Panel A—Wave 1						
Ethnic diversity	0.184*** (0.018)	0.084*** (0.024)	0.099*** (0.012)	0.042*** (0.014)	0.090*** (0.016)	0.030* (0.017)
Controls	No	Yes	No	Yes	No	Yes
Observations	8,576	5,618	8,576	5,618	8,576	5,618
Panel B—Wave 2						
Ethnic diversity	0.148*** (0.020)	0.012*** (0.001)	0.101*** (0.015)	0.025* (0.014)	0.062*** (0.017)	−0.019 (0.026)
Controls	No	Yes	No	Yes	No	Yes
Observations	6,850	3,824	6,850	3,824	6,850	3,824
Panel C—Waves 1 and 2						
Ethnic diversity	0.161*** (0.013)	0.059*** (0.018)	0.104*** (0.009)	0.041*** (0.012)	0.080*** (0.011)	0.015 (0.015)
Controls	No	Yes	No	Yes	No	Yes
Observations	15,426	9,442	15,426	9,442	15,426	9,442

Notes: All regressions control for regional fixed effects, while regressions in Panel C also include time fixed effects; standard errors in parentheses; *** $p < 0.01$; * $p < 0.1$.

Source: authors' construction based on own analysis.

Across all columns and panels of the table, the general conclusion suggested by the results is that ethnic diversity is associated with a higher probability of being involved in informal work. Comparing estimates from Columns 1, 3, and 5 with those reported in Columns 2, 4, and 6, we find that with the inclusion of the relevant covariates, the coefficient on ethnic diversity reduces in magnitude. Depending on the specification and sample, we find that a unit increase in ethnic diversity is associated with a 1.2 to 18.4 percentage point increase in the probability of engaging in informal work.

Table 2 reports IV probit results using lag of ethnic diversity based on 2000 census information as an instrument. Across all specifications, findings from the first stage confirm the validity of our instruments. Specifically, the F-statistics show that our instruments are not weakly correlated with district-level ethnic diversity, while the positive effect of the instrument is consistent with expectations and the previous literature (see, e.g. Awaworyi Churchill et al. 2019). Consistent with the baseline results, we find that the coefficients on ethnic diversity are positive. Thus, the IV probit results confirm the positive relationship between ethnic diversity and informal work. However, the IV estimates are relatively lower in magnitude compared with the baseline estimates, suggesting that endogeneity generates an upward bias in our baseline estimates. Depending on the specification and sample, we find that a unit increase in ethnic diversity is associated with up to a 16.7 percentage point increase in the probability of engaging in informal work. The non-linear effect of ethnic diversity is also much weaker, here given that the coefficients on the quadratic term of ethnic diversity are mostly insignificant.

In Table 3, we present Lewbel 2SLS results. Here, estimates from Columns 1, 3, and 5 are drawn from regressions using only internally generated instruments, while those reported in Columns 2, 4, and 6 are drawn from regressions that combine our external instrument (lag of ethnic diversity) with internally generated instruments. Overall, these results also reinforce the existing conclusion of a positive relationship between ethnic diversity and informal work. We find that a unit increase in ethnic diversity is associated

Table 2. Ethnic diversity and informal work (IV results)

Variables	Informal work		Informal work (wage employment)		Informal work (self-employment)	
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A—IV with external instrument (Wave 1)						
Ethnic diversity	0.167*** (0.017)	0.072*** (0.021)	0.082*** (0.011)	0.029*** (0.004)	0.076*** (0.014)	0.023 (0.018)
Controls	No	Yes	No	Yes	No	Yes
Observations	8,576	5,618	8,576	5,618	8,576	5,618
Instrument	0.518*** (0.020)	0.450*** (0.023)	0.518*** (0.020)	0.450*** (0.023)	0.518*** (0.020)	0.450*** (0.023)
<i>F</i> -statistics	173.01	129.22	173.01	129.22	173.01	129.22
<i>R</i> -squared	0.1031	0.1397	0.1031	0.1397	0.1031	0.1397
Panel B—IV with external instrument (Wave 2)						
Ethnic diversity	0.099*** (0.019)	0.006* (0.004)	0.085** (0.033)	0.055 (0.051)	0.045*** (0.017)	0.034 (0.062)
Controls	No	Yes	No	Yes	No	Yes
Observations	6,850	3,824	6,850	3,824	6,850	3,824
Instrument	0.956*** (0.027)	0.902*** (0.032)	0.956*** (0.027)	0.902*** (0.032)	0.956*** (0.027)	0.902*** (0.032)
<i>F</i> -statistics	121.36	94.20	121.36	94.20	121.36	94.20
<i>R</i> -squared	0.0816	0.1249	0.0816	0.1249	0.0816	0.1249
Panel C—IV with external instrument (Waves 1 and 2)						
Ethnic diversity	0.106*** (0.012)	0.048*** (0.008)	0.075*** (0.022)	0.035*** (0.002)	0.056* (0.033)	0.054* (0.031)
Controls	No	Yes	No	Yes	No	Yes
Observations	15,426	9,442	15,426	9,442	15,426	9,442
Instrument	0.961*** (0.018)	0.998*** (0.020)	0.961*** (0.018)	0.998*** (0.020)	0.961*** (0.018)	0.998*** (0.020)
<i>F</i> -statistics	272.11	187.23	272.11	187.23	272.11	187.23
<i>R</i> -squared	0.1058	0.1080	0.1058	0.1080	0.1058	0.1080

Notes: All regressions control for regional fixed effects, while regressions in Panel C also include time fixed effects; standard errors in parentheses; *** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$.

Source: Authors' construction based on own analysis.

with up to a 13.4 percentage point increase in the probability of engaging in informal work, depending on the specification.

Next, we examine the sensitivity to PSM of our results as an alternative approach to addressing endogeneity. PSM results using different matching algorithms are reported in Table 4. Given that our baseline results show that ethnic diversity is associated with a higher probability of engaging in informal work, we consider the treatment here as respondents who live in ethnically homogeneous districts. Panel A reports results based on the 0.5 threshold while Panel B reports results using the mean of ethnic diversity as the cut-off. Using the combined samples from Waves 1 and 2, we find that living in ethnically homogeneous districts is associated with a lower probability of engaging in informal work. This finding is consistent with the baseline and IV results.

In Table 5, we examine the robustness of our results to alternative measures of diversity. Columns 1, 3, and 5 report results in which we use the index of ethnic polarization rather than the Herfindahl index, while in Columns 2, 4, and 6 we report results for the effects of religious fractionalization. We find that the effect of ethnic diversity on the prevalence of informal work is not sensitive to how diversity is measured. Overall, the results from Table 5 reinforce the finding of a positive association between ethnic diversity and informal work.

Table 3. Ethnic diversity and informal work (Lewbel 2SLS results)

Variables	Informal work		Informal work (wage employment)		Informal work (self-employment)	
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A—Wave 1						
Ethnic diversity	0.134*** (0.018)	0.107* (0.055)	0.074*** (0.013)	0.078*** (0.019)	0.057*** (0.015)	0.023* (0.013)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5,618	5,618	5,618	5,618	5,618	5,618
<i>F</i> -statistics	50.11	138.13	50.11	138.13	50.11	138.13
Sargan <i>p</i> value	0.0511	0.0894	0.0615	0.1070	0.4128	0.3156
Panel B—Wave 2						
Ethnic diversity	0.100*** (0.023)	0.087*** (0.017)	0.085 (0.097)	0.014 (0.064)	0.012 (0.046)	0.006 (0.056)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3,824	3,824	3,824	3,824	3,824	3,824
<i>F</i> -statistics	29.03	94.40	29.03	94.40	29.03	94.40
Sargan <i>p</i> value	0.6558	0.7091	0.3539	0.1395	0.0578	0.0601
Panel C—Waves 1 and 2						
Ethnic diversity	0.097*** (0.006)	0.068*** (0.009)	0.071*** (0.013)	0.091*** (0.025)	0.045*** (0.015)	0.014* (0.008)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	9,442	9,442	9,442	9,442	9,442	9,442
<i>F</i> -statistics	76.82	230.84	76.82	230.84	76.82	230.84
Sargan <i>p</i> value	0.2488	0.2349	0.4901	0.0263	0.2211	0.1379

Notes: All regressions include relevant control variables and control for regional fixed effects; odd columns present estimates from Lewbel 2SLS regressions with internal instruments only; even columns present estimates from Lewbel 2SLS regressions with both external and internal instruments; standard errors in parentheses. *** $p < 0.01$; * $p < 0.1$.

Source: Authors' own construction based on own analysis.

Next, we examine the robustness of our results to the use of indices of ethnic diversity generated based on data from the GSPS as opposed to the census. Like the census, the GSPS provides information on respondents' ethnic groups. The GSPS also provides information on the district within which each respondent lives. This district (location) information on each respondent provides a precise geographical identifier, which we use to calculate an alternative district level ethnic diversity measure. The results reported in [Table 6](#), show that our results are robust to this alternative indicator of ethnic diversity.

We also examine the robustness of our results to the random effect probit model and to omitted variable bias using the Oster (2019) bounds analysis. [Table 7](#) reports the random effect results. We find that the positive relationship between ethnic diversity and informality is reinforced. Lastly, we use the Oster (2019) bounding analysis to determine if omitted variables and unobservables are biasing our estimate. This approach is increasingly used to deal with endogeneity arising from omitted variable bias, and as a check on the potential effects of omitted variable bias (see, e.g. Hailemariam, Awaworyi Churchill, Smyth, & Baako, 2021). The bounding analysis draws on information on coefficients and R-squared to calculate bounding values. We find that the bounds or identified set excludes zero, indicating that the estimates from our controlled regressions are robust to omitted variable bias. Additionally, we find that for effects of omitted variables to be a problem, at the minimum, the effects have to be more than 8.8 times larger than the effects of the explanatory variables that we control for, which is unlikely.

Table 4. PSM results with different matching methods

Matching method	ATT (average treatment effect on the treated)		
	(1)	(2)	(3)
Panel A			
1 – Nearest neighbour (one to one)	–0.099*** (0.018)	–0.040*** (0.014)	–0.071** (0.031)
4 – Nearest neighbor	–0.096*** (0.019)	–0.041*** (0.012)	–0.070** (0.031)
Radius	–0.098*** (0.020)	–0.040*** (0.012)	–0.073** (0.031)
Kernel	–0.098*** (0.020)	–0.040*** (0.011)	–0.071** (0.031)
Panel B			
1 – Nearest neighbour (one-to-one)	–0.098*** (0.019)	–0.036*** (0.014)	–0.022* (0.013)
4 – Nearest neighbor	–0.093*** (0.019)	–0.035*** (0.011)	–0.022* (0.013)
Radius	–0.098*** (0.020)	–0.032*** (0.010)	–0.023* (0.013)
Kernel	–0.096** (0.030)	–0.032*** (0.010)	–0.022* (0.013)

Notes: Column 1 reports results for overall informal work, Column 2 results for informal wage employment, Column 3 results for informal self-employment; standard errors in parentheses; *** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$.

Source: Authors' construction based on own analysis.

Table 5. Ethnic diversity and informal work (alternative measures of diversity)

Variables	Informal work		Informal work (wage employment)		Informal work (self-employment)	
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A—Wave 1						
Diversity	0.084*** (0.004)	0.105** (0.053)	0.046** (0.021)	0.124*** (0.033)	0.020* (0.011)	0.100*** (0.028)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5,618	5,618	5,618	5,618	5,618	5,618
Panel B—Wave 2						
Diversity	0.098*** (0.016)	0.144** (0.067)	0.063*** (0.010)	0.179*** (0.045)	0.061*** (0.018)	0.044*** (0.004)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3,824	3,824	3,824	3,824	3,824	3,824
Panel C—Waves 1 and 2						
Diversity	0.108*** (0.009)	0.126*** (0.042)	0.032* (0.019)	0.119*** (0.021)	0.017 (0.012)	–0.022 (0.033)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	9,442	9,442	9,442	9,442	9,442	9,442

Notes: All regressions include relevant control variables; odd columns present estimates for the effects of ethnic polarization, even columns estimates for the effects of religious fractionalization; standard errors in parentheses; *** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$.

Source: Authors' construction based on own analysis.

5.1. Potential channel analysis

Section 2 discussed trust as an important channel through which ethnic diversity might influence informal work. In this section, we take advantage of the 'neighbourhood trust' question in the GSPS to examine the role of trust as a channel of influence. Although we are unable to

Table 6. Ethnic diversity and informal work (ethnic diversity based on GSPS data)

Variables	Informal work		Informal work (wage employment)		Informal work (self-employment)	
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A—Wave 1						
Ethnic diversity	0.230*** (0.038)	0.078** (0.032)	0.115*** (0.024)	0.018* (0.011)	0.133*** (0.040)	0.027*** (0.006)
Controls	No	Yes	No	Yes	No	Yes
Observations	8,576	5,618	8,576	5,618	8,576	5,618
Panel B—Wave 2						
Ethnic diversity	0.107*** (0.016)	0.046*** (0.004)	0.095*** (0.013)	0.055*** (0.008)	0.073*** (0.016)	0.038*** (0.006)
Controls	No	Yes	No	Yes	No	Yes
Observations	6,850	3,824	6,850	3,824	6,850	3,824
Panel C—Waves 1 and 2						
Ethnic diversity	0.131*** (0.011)	0.057*** (0.007)	0.082*** (0.021)	0.022*** (0.002)	0.156*** (0.013)	0.054* (0.031)
Controls	No	Yes	No	Yes	No	Yes
Observations	15,426	9,442	15,426	9,442	15,426	9,442

Notes: Standard errors in parentheses; *** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$.

Source: authors' construction based on own analysis.

Table 7. Ethnic diversity and informal work (random effect model)

Variables	Informal work		Informal work (wage employment)		Informal work (self-employment)	
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A—Wave 1						
Ethnic diversity	0.190*** (0.017)	0.061** (0.029)	0.079*** (0.012)	0.054** (0.018)	0.128*** (0.020)	0.040* (0.022)
Controls	No	Yes	No	Yes	No	Yes
Observations	8,576	5,618	8,576	5,618	8,576	5,618
Panel B—Wave 2						
Ethnic diversity	0.099*** (0.012)	0.67*** (0.010)	0.142*** (0.025)	0.089*** (0.009)	0.117*** (0.012)	0.086* (0.040)
Controls	No	Yes	No	Yes	No	Yes
Observations	6,850	3,824	6,850	3,824	6,850	3,824
Panel C—Waves 1 and 2						
Ethnic diversity	0.206*** (0.083)	0.097*** (0.016)	0.096* (0.050)	0.094 (0.068)	0.219*** (0.070)	0.153* (0.082)
Controls	No	Yes	No	Yes	No	Yes
Observations	15,426	9,442	15,426	9,442	15,426	9,442

Notes: Standard errors in parentheses; *** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$.

Source: Authors' construction based on own analysis.

isolate the role of all potential channels as we do not have the data to do so, we are, however, able to examine the role of trust, which is an important variable that underlies other channels discussed in Section 2.

Our measure of trust is based on the GSPS survey question in which respondents are asked the extent to which they agree with the statement 'Most people in this village [neighbourhood] can be trusted (it is safe to deal with most people in this village[neighbourhood])'. Responses are coded on a five-point scale where 1 represents 'strongly disagree' and 5 represents 'strongly agree'. Our approach to examining trust as a potential channel is consistent with the existing literature (Alesina & Zhuravskaya, 2011; Awaworyi Churchill et al. 2019). For trust to qualify as

Table 8. Ethnic diversity and trust (ordered logit regression)

Variables	(1) Wave 1 Trust	(2) Wave 2 Trust	(3) Waves 1 and 2 Trust
Ethnic diversity	-0.388*** (0.061)	-0.403*** (0.052)	-0.392*** (0.040)
Observations	7,033	6,008	13,041

Notes: Robust standard errors in parentheses; *** $p < 0.01$.

Outcome variable is trust.

Source: Authors' construction based on own analysis.

Table 9. Potential channel analysis

	(1)	(2)	(3)
Panel A—Wave 1			
Ethnic diversity	0.061*** (0.018)	0.029** (0.014)	0.004 (0.004)
Trust	-0.012** (0.005)	-0.019*** (0.004)	-0.007** (0.003)
Controls	Yes	Yes	Yes
Observations	4,554	4,554	4,554
Panel B—Wave 2			
Ethnic diversity	0.003 (0.034)	0.007* (0.004)	-0.024 (0.029)
Trust	-0.019*** (0.005)	-0.014*** (0.004)	-0.004 (0.005)
Controls	Yes	Yes	Yes
Observations	3,690	3,690	3,690
Panel C—Waves 1 and 2			
Ethnic diversity	0.040* (0.021)	0.023** (0.010)	0.001 (0.018)
Trust	-0.017*** (0.004)	-0.015*** (0.003)	-0.011*** (0.003)
Controls	Yes	Yes	Yes
Observations	8,244	8,244	8,244

Notes: Column 1 reports results for overall informal work, Column 2 results for informal wage employment, Column 3 results for informal self-employment; all regressions control for regional fixed effects; standard errors in parentheses; *** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$.

Source: authors' construction based on own analysis.

a channel of influence, in addition to being correlated with ethnic diversity it should also be correlated with informal work, and the inclusion of trust as an additional covariate in the regression linking informal work to ethnic diversity should decrease the magnitude of the coefficient on ethnic diversity or render it statistically insignificant.

Table 8 reports result from regressions linking trust to ethnic diversity. We find that an increase in ethnic diversity is associated with lower levels of trust. This finding is consistent with the broader literature that has examined the relationship between trust and ethnic diversity (see, e.g. Leigh, 2006). Table 9 reports results for regressions that include trust as an additional covariate in the fully specified informal work regressions. We find that trust is negatively associated with informal work, and thus an increase in trust is associated with a lower probability of engaging in informal work. Further, the inclusion of trust as an additional control variable either reduces the magnitude of the coefficient on ethnic diversity or renders it statistically insignificant. This is evident when we compare the coefficients on ethnic diversity to the baseline estimates. This result confirms that trust is a channel that links ethnic diversity to informal work.

6. Conclusion

Drawing on two waves of the GSPS, we have examined the effects of ethnic diversity on informal work in Ghana. We find that ethnic diversity is associated with a higher probability of engaging in informal work. While a large body of literature presents evidence on the benefits of ethnic diversity, in this study we find that the positive effects of ethnic diversity are diminished by certain factors, including lower levels of trust. We find that while trust plays an important role in reducing the probability of engaging in informal work, it is lower in ethnically diverse communities.

Our findings show that understanding the impact of ethnic diversity on informal work is important because it provides a new perspective on factors worth considering when devising policies aimed at influencing the prevalence of informality. Ethnicity (and consequently ethnic diversity) has become a defining feature of society and presents implications at various levels, especially for countries like Ghana and other developing countries where diversity levels are high. We demonstrate that in addition to economic and institutional factors considered in the literature, sociocultural factors such as ethnic diversity have an important role in explaining the prevalence of informality and should thus be a factor of interest when devising policies. In an attempt to promote economic development, alleviate poverty, and reduce inequality, the World Bank and the International Monetary Fund have encouraged developing countries to implement various economic policy reforms, including privatization and trade liberalization. The findings from this study demonstrate that, alongside these economic factors, attention should be given to ethnic diversity, which has not been a primary consideration in policies to enhance economic development (Miguel, 2006).

The priority for policy-makers in developing countries is to promote economic growth accompanied by low levels of poverty and inequality. It is therefore important that policies are put in place to promote the productivity of informal sectors, and also to encourage the move to more productive sectors when relevant. Our findings suggest that policies to foster trust in diverse societies are important. While ethnic diversity has been associated with poorer public policy performance, slower financial development and economic growth, less infrastructure investment and development (Easterly & Levine, 1997), and poorer institutional quality and governance (Alesina & Zhuravskaya, 2011), evidence suggests that trust is an important channel through which diversity works to influence these outcomes. It is therefore important that policy is aimed at shaping this important outcome in ethnically diverse communities.

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No potential conflict of interest was reported by the author(s).

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Appendix

Table A1. Description of variables and summary statistics.

Variables	Description	Wave 1		Wave 2	
		Mean	SD	Mean	SD
Ethnic diversity	Index of ethnic fractionalization for Ghanaian districts	0.618	0.210	0.618	0.210
Polarization	Index of ethnic polarization for Ghanaian districts	0.579	0.143	0.579	0.143
Religious diversity	Index of religious fractionalization for Ghanaian districts	0.735	0.136	0.735	0.136
Informal work	Binary variable equals 1 if respondent engages in informal work (i.e., wage or self-employed)	0.212	0.409	0.223	0.416
Informal wage employment	Binary variable equals 1 if respondent engages in informal wage employment	0.0715	0.258	0.0873	0.282
Informal self-employment	Binary variable equals 1 if respondent engages in informal self-employment	0.145	0.352	0.147	0.354
Age	Age of respondent	34.17	13.78	35.78	14.40
Age squared	Square of age/100	13.58	10.34	14.88	11.01
Male	Binary variable equals 1 if respondent is male	0.457	0.498	0.456	0.498
Female	Binary variable equals 1 if respondent is female	0.543	0.498	0.544	0.498
Urban	Binary variable equals 1 if respondent lives in urban area	0.363	0.481	0.368	0.482
Primary	Binary variable equals 1 if highest level of education for respondent is primary education	0.0952	0.294	0.0844	0.278
Post-primary	Binary variable equals 1 if highest level of education for respondent is post-primary junior secondary education	0.601	0.490	0.553	0.497
Secondary	Binary variable equals 1 if highest level of education for respondent is senior secondary education	0.0966	0.295	0.117	0.321
Post-secondary	Binary variable equals 1 if highest level of education for respondent is post-secondary school	0.0184	0.135	0.0127	0.112
Tertiary	Binary variable equals 1 if highest level of education for respondent is tertiary education	0.0198	0.139	0.0425	0.202
Married	Binary variable equals 1 if respondent is married	0.507	0.500	0.487	0.500

Source: Authors' construction based on own analysis.

Table A2. Full results for the effects of ethnic diversity on informal work (Wave 1).

Variables	Informal work		Informal work (wage employment)		Informal work (self-employment)	
	(1)	(2)	(3)	(4)	(5)	(6)
Ethnic diversity	0.184*** (0.018)	0.084*** (0.024)	0.099*** (0.012)	0.042*** (0.014)	0.090*** (0.016)	0.030* (0.017)
Age		0.070*** (0.003)		0.022*** (0.002)		0.043*** (0.002)
Age squared		-0.083*** (0.004)		-0.026*** (0.002)		-0.050*** (0.003)
Female		0.033*** (0.011)		-0.075*** (0.007)		0.103*** (0.008)
Married		-0.033** (0.013)		-0.026*** (0.008)		-0.001 (0.009)
Urban		0.104*** (0.012)		0.038*** (0.007)		0.048*** (0.009)
Primary		0.011 (0.024)		0.014 (0.015)		0.004 (0.017)
Post-primary		0.005 (0.016)		0.020* (0.010)		-0.006 (0.012)
Secondary		0.013 (0.023)		0.053*** (0.014)		-0.035** (0.018)
Post-secondary		0.012 (0.041)		0.082*** (0.021)		-0.067** (0.033)
Tertiary		-0.098** (0.042)		0.049** (0.022)		-0.156*** (0.039)
Observations	8,576	5,618	8,576	5,618	8,576	5,618

Notes: All regressions control for regional fixed effects; standard errors in parentheses; *** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$.

Source: Authors' construction based on own analysis.

Table A3. Full results for the effects of ethnic diversity on informal work (Wave 2).

Variables	Informal work		Informal work (wage employment)		Informal work (self-employment)	
	(1)	(2)	(3)	(4)	(5)	(6)
Ethnic diversity	0.148*** (0.020)	0.012*** (0.001)	0.101*** (0.015)	0.025* (0.014)	0.062*** (0.017)	-0.019 (0.026)
Age		0.037*** (0.005)		0.004 (0.003)		0.044*** (0.004)
Age squared		-0.040*** (0.005)		-0.008** (0.003)		-0.045*** (0.005)
Female		-0.220*** (0.015)		-0.108*** (0.010)		-0.132*** (0.012)
Married		-0.064*** (0.016)		-0.027** (0.011)		-0.020 (0.013)
Urban		0.096*** (0.016)		0.058*** (0.011)		0.041*** (0.014)
Primary		-0.027 (0.034)		-0.004 (0.024)		-0.027 (0.028)
Post-primary		0.031 (0.021)		0.026 (0.021)		0.012 (0.017)
Secondary		0.048 (0.029)		0.060*** (0.018)		-0.029 (0.025)
Post-secondary		-0.000 (0.059)		0.034 (0.037)		-0.056 (0.050)
Tertiary		-0.060 (0.037)		0.009 (0.023)		-0.072** (0.031)
Observations	6,850	3,824	6,850	3,824	6,850	3,824

Notes: All regressions control for regional fixed effects; standard errors in parentheses; *** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$.

Source: authors' construction based on own analysis.

Table A4. Full results for the effects of ethnic diversity on informal work (Waves 1 and 2).

Variables	Informal work		Informal work (wage employment)		Informal work (self-employment)	
	(1)	(2)	(3)	(4)	(5)	(6)
Ethnic diversity	0.161*** (0.013)	0.059*** (0.018)	0.104*** (0.009)	0.041*** (0.012)	0.080*** (0.011)	0.015 (0.015)
Age		0.059*** (0.002)		0.020*** (0.001)		0.041*** (0.002)
Age squared		-0.067*** (0.003)		-0.024*** (0.002)		-0.045*** (0.002)
Female		-0.064*** (0.009)		-0.089*** (0.006)		0.016** (0.007)
Married		-0.035*** (0.010)		-0.028*** (0.007)		-0.002 (0.008)
Urban		0.094*** (0.010)		0.047*** (0.006)		0.044*** (0.008)
Primary		0.001 (0.019)		0.011 (0.013)		-0.006 (0.016)
Post-primary		0.012 (0.012)		0.022*** (0.009)		0.002 (0.010)
Secondary		0.032* (0.018)		0.064*** (0.011)		-0.028* (0.015)
Post-secondary		0.014 (0.033)		0.071*** (0.020)		-0.055* (0.029)
Tertiary		-0.070*** (0.026)		0.030* (0.016)		-0.086*** (0.022)
Observations	15,426	9,442	15,426	9,442	15,426	9,442

Notes: All regressions control for regional fixed effects; standard errors in parentheses; *** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$.

Source: Authors' construction based on own analysis.