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Ethnic diversity and financial inclusion in post-apartheid South Africa

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Abstract: The ethnic diversity–financial inclusion nexus remains one of the least explored topics in the literature despite global attempts to promote cultural mixing due to its socioeconomic benefits. We contribute to the literature by examining the link between ethnic diversity and financial inclusion using five-wave panel data from South Africa, a country noted for its diverse ethnic groups with unique knowledge stock. We measure financial inclusion using a multidimensional construct, while ethnic diversity is conceptualized using fractionalization and polarization indexes. After addressing endogeneity using various quasi-experimental techniques, we find that ethnic diversity increases financial inclusion, with men and urban residents experiencing higher beneficial impacts of ethnic diversity. Further analysis reveals that increased employment opportunities and social group membership serve as potential pathways via which ethnic diversity increases financial inclusion. Carefully designed policies aimed at promoting ethnic diversity will go a long way to boosting financial inclusion.

Key words: ethnic diversity, financial inclusion, employment, social groups, South Africa

JEL classification: D03, D14, J15

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1 Introduction

Financial inclusion refers to the provision of financial services, including mobile money accounts, to all members of the population, particularly the poor and other marginalized groups, at a reasonable cost, and their effective use (Demirgüç-Kunt et al. 2017, 2018; Dutta and Mukherjee 2012). An inclusive financial environment safeguards equitable access to resources and prospects for all (Amin et al. 2023). Financial inclusion improves individual and household wellbeing because it facilitates household investments in education, health, and business ventures, as well as productivity gains (Bukari and Koomson 2020; Gyasi et al. 2019; Koomson et al. 2020; Li 2018; Njiru and Letema 2018; Stein and Yannelis 2020; Zulfiqar 2017). Specifically, financial inclusion has been identified as one of the main channels capable of reducing poverty and enhancing living standards (Danquah et al. 2017; Dogan et al. 2021; Dupas and Robinson 2013; Koomson and Danquah 2021; Zulfiqar 2017). For instance, access to, and use of, a transaction account makes it possible for individuals and households to store, send, and receive money payments. This enables them to engage in future-facing investments, smooth spending over time, and withstand income shocks (Demirgüç-Kunt et al. 2017; Koomson and Danquah 2021; Koomson et al. 2022). The ability of individuals and households to undertake financial transactions effectively and securely can boost household investments in education, health, and microenterprises that in the long run can lead to higher labour incomes and economic growth (Abdul-Mumuni and Koomson 2019; Demirgüç-Kunt et al. 2017; Kuri and Laha 2011).

Albeit sub-Saharan Africa (SSA) has made remarkable progress in financial inclusion over the past decade, the region and most countries within it still lag behind other regions. For instance, in spite of this growth, the Findex 2021 report shows that SSA is still among the bottom three regions globally in terms of account ownership and usage (Demirgüç-Kunt et al. 2022). This shows that advancements in financial inclusion in SSA require significant efforts, with a particular focus on user-value-driven access to financial services and products. The ethnic diversity–financial inclusion nexus remains one of the least explored topics in the literature. It is also among the least discussed topics in policy circles, despite global attempts to promote cultural mixing due to its socioeconomic benefits. It is likely, however, that ethnic diversity can increase financial inclusion through increasing generalized trust in African countries (Xu 2020).

'Ethnic diversity' refers to the heterogeneity between people of different ethnic groups that exist in a society or community; it therefore captures the level of ethnic concentration or divide of ethnic groups in a given geographic area (Awaworyi Churchill 2017; Greenberg 1956). In other words, ethnic diversity describes the probability that two randomly selected individuals from a given geographic area are from distinct ethnic groups. The seminal papers by Francis Fukuyama and Douglas North show that ethnic diversity has an impact on societies and communities because it is strongly integrated into human interaction, whether socioeconomic or political (Fukuyama 2001; North 1991). Over the last two decades, it has been shown that diversity matters in financial development via essential impact mechanisms such as trust and strong social networks (Altinay et al. 2014). Some papers, albeit at the cross-country level, show that diversity promotes financial market growth (Alesina and Ferrara 2005; Amin et al. 2023; Baier and Bergstrand 2001; Collier 2000; Xu 2020; Yanikkaya 2003). For instance, Amin et al. (2023) empirically examine the association between ethnic and religious diversity and financial inclusion using data across 187 countries globally and find a strong positive relationship between financial inclusion and ethnic or religious diversity, or both. Tang et al. (2016) find that diversity can assist people to become more financially included, although the effect may differ between nations, while Dutta and Mukherjee (2012) show that individuals' opinions about financial markets may change as societies change due to increasing trust and strengthened social networks. Ethnic diversity may therefore produce a

stable, non-coercive, innovative community through rigorous public dialogue based on trust and social networks. This may influence entrepreneurship and innovation and increase the prospect of more people to engaging in more financial transactions. Despite the evidence, these studies are at the national/macro level, making it imperative to undertake an individual-level analysis and to produce findings disaggregated by gender and location, to increase understanding of that side of the story.

Consequently, we set out to empirically examine significant effects on financial inclusion that ethnic diversity could have at the micro level. Using South Africa, a country noted for its diverse ethnic groups with unique knowledge stock, as a case study, we examine the impacts of a high level of ethnic diversity on financial inclusion. Using five-wave panel data from the country, we address endogeneity using various quasi-experimental techniques. We find that ethnic diversity increases financial inclusion, with men and urban residents experiencing higher beneficial impacts of ethnic diversity. Further analysis reveals that increased employment opportunities and social group membership serve as potential pathways via which ethnic diversity increases financial inclusion.

South Africa, the country context for this paper, has an ethnic fractionalization score of 0.88, making it one of the most ethnically diverse nations in the world (Fearon 2003). It has also seen increasing growth in financial inclusion (Demirgüç-Kunt et al. 2022). South Africa had a history of racial and ethnic segregation during the apartheid era, period marked by a system of authoritarian institutionalized racial segregation under which the white minority controlled the greater part of the economic resources and political power (Moodley and Adam 2000). Global Findex data report that financial inclusion in South Africa was at 85 per cent in 2021 (a 16 per cent increase compared with the 2017 value) but the rate of inclusion among the poor was 75 per cent (Demirgüç-Kunt et al. 2018, 2022). There was a 1.6 per cent gender gap in financial inclusion in favour of women in 2021, compared with no gap in 2017 (Demirgüç-Kunt et al. 2018, 2022). White South Africans are more financially included than native black South Africans, despite white South Africans making up less than 10 per cent of the population (Mhlanga and Garidzirai 2020). Financially excluded individuals and households in South Africa tend to be disproportionately black (Omran 2018), with such exclusions in access to financial services and products having the potential to affect their ability to improve their livelihoods.

The Population Registration Act No. 30 of 1950, introduced during the apartheid period, divided the South African population into three main groups based on racial lines: native blacks, whites, and Indians or coloured people (Kon and Lackan 2008). Native black residents were further divided into small ethnic groups. Other legislation, such as the 1950 Group Areas Act and 1959 Self-Government Act (see Beck 2000; Clark and Worger 2013), further assigned individuals to specific localities based on their race. Political, economic, and social decisions were based on segregation. As a result, whites had the political right to vote and could access quality education, health, and skilled jobs, among other things, while the native black population did not have access to these rights and opportunities (Beck 2000; Clark and Worger 2013). Reforms were introduced in 1994 to abolish all apartheid laws, opening the way for all South Africans to move freely across towns and provinces. Post-apartheid reforms, including the transformation and reconciliation agenda, were launched by the government of South Africa to promote ethnic diversity and socioeconomic benefits (Henrard 2003).

This study contributes to the literature and policy in several ways. First, we provide a clearer understanding at the micro level of how ethnic diversity affects financial inclusion in South Africa. Since most of the extant studies have focused on cross-country analysis, these relationships have not been considered at the micro or individual level in a large longitudinal dataset. Thus, this paper is among the first to study this nexus at this level. Second, evidence from this study provides policy-makers in South Africa with a further dimension to consider as they continue to develop

programmes and strategies to reduce poverty and promote welfare. Finally, the findings from this study will provide insights for policy and replicative studies in countries with similar historical antecedents regarding race/ethnic segregation.

The remainder of the paper proceeds as follows. Section 2 reviews the literature to consider the mechanisms through which ethnic diversity may influence financial inclusion. Section 3 provides a description of the data and variables used for the study, while Section 4 describes the analytical procedures used. Section 5 explains the empirical results and Section 6 presents concluding remarks.

2 The conceptual link between ethnic diversity and financial inclusion

This section provides a conceptual discussion of how ethnic diversity potentially influences financial inclusion, focusing on the main mechanisms via which such influence occurs. We then proceed to empirically test the roles of these channels in promoting financial inclusion.

2.1 Employment opportunities

Based on evidence from the literature, ethnic diversity has the potential to enhance entrepreneurship (Awaworyi Churchill 2017; Cross et al. 2000), which can further increase employment opportunities. Higher levels of ethnic diversity within communities offer a richer mix of ideas and skills, which further promotes economic growth (Huggins and Thompson 2015; Sobel et al. 2010). Ethnic diversity also impacts the pace of new business formation, which may have a beneficial impact on community development (Awaworyi Churchill and Danquah 2022).

Clearly, ethnic diversity motivates new ideas, efficiency gains, and growth in the number of entrepreneurs and new businesses, thereby promoting economic activities in communities. The boost in economic activities and the consequent effect on employment opportunities and incomes can drive the demand for financial services and products. This positive association between the creation of new entrepreneurs and businesses, new employment opportunities, and financial inclusion suggests that ethnic diversity can influence financial inclusion via its effect on the creation of employment opportunities in communities.

2.2 Social group membership

Dutta and Mukherjee (2012) have argued that individuals' perceptions about economic issues, particularly finance, can change based on opinions in their communities or societies due to increasing social capital, including in relation to trust, social networks, and other attributes. For instance, the likelihood of engaging in more financial transactions could depend on trust or social networks in the community. The extant literature shows that people with similar ethnic and cultural backgrounds are bonded by trust (Karlan 2005). Given that an environment that enables business to thrive depends on trust and social networks, these attributes of ethnic diversity play vital roles in the performance of businesses and, to an extent, economic activities (Kreiser et al. 2013; McEvily and Marcus 2005). Trust has been shown to be significant in defining formal institutions, influencing economic transaction, and enforcing contracts (Alesina and Zhuravskaya 2011; Awaworyi Churchill 2017). Again, trust and social networks promote entrepreneurship, an attribute often associated with certain ethnic groups. Trust is seen as important for maintaining strong social networks that promote cohesion, a significant element of collective action. With high

levels of trust, individuals are able to form groups to reach agreements on a common good, due to the ability to resolve differences and pursue collective interests.

The literature shows that trust and social networks are positively associated with access to both formal and informal finance and firm performance, among other factors (El-Attar and Poschke 2011; Wu et al. 2014). This is particularly due to the ability to form groups based on ethnic differences, which are then developed through social networks, as a mechanism to access financial services and products. This positive relationship between the formation of social group membership through trust and financial inclusion indicates that ethnic diversity can impact financial inclusion via trust and social group membership.

2.3 Income

Related to the boost in economic activities, ethnic diversity results in increased efficiency gains and productivity due to the transfer of knowledge and ideation by people with diverse cognitive skills (Bai et al. 2020; Hong and Page 1998; Ottaviano and Peri 2006; Trax et al. 2015). Ethnic diversity promotes cultural capital, a feature that reflects the level of innovation in diverse communities (Sobel et al. 2010). The more cognitively diverse a group is, the more likely it is to find optimal answers to challenging problems (Hong and Page 1998). Thus, in a business establishment, involving individuals from a range of different ethnic and racial backgrounds is more efficient because of the diverse viewpoints offered in solving a problem. The resulting increase in productivity enhances the competitiveness of businesses and total revenue gains, resulting in higher incomes.

The end of apartheid in South Africa made it possible for individuals from diverse ethnic backgrounds to work and improve their incomes and the performance of businesses (Setati et al. 2019). The increase in ethnic diversity at the workplace and the subsequent improvement in incomes may lead to improved access and usage of financial services and products. An increase in the income of individuals, particularly black natives and rural dwellers from low-income groups, can enable them to afford vital financial services and products. This positive association between income and financial inclusion shows that ethnic diversity can influence financial inclusion through its role in promoting increased income (Amin et al. 2023).

3 Data and variable measurements

3.1 Data

This study makes use of five rounds of panel data (2008, 2010, 2012, 2014, and 2017) from the South African National Income Dynamics Study (NIDS). The NIDS data are collected and managed by the Southern Africa Labour and Development Research Unit (SALDRU), located in the University of Cape Town's School of Economics. The NIDS contains a wealth of information, such as language spoken, ownership of financial and durable assets, credit, income, demographics, employment, and energy sources, at both the household and individual levels (Branson and Wittenberg 2018). Brophy et al. (2018) provide in-depth information on the NIDS data and the modules covered in it. We compute district-level ethnic diversity from the NIDS. To produce consistent estimates, we resolve endogeneity by computing province-level ethnic diversity measures using the 1996 South African census of households, which is used as an instrument. Consistent with existing studies, such as the Global Findex data (Demirgüç-Kunt et al. 2018) and InterMedia Financial Inclusion Insights (FII) Program (InterMedia 2017), we measure financial inclusion for individuals aged 15 and above located in all 52 districts across the nine provinces of

South Africa. After extracting the data we had a dataset with 109,389 observations, but the workable sample contained 69,475 observations due to the remittance variable, which had many missing entries. Due to missing observations associated with other variables in the analysis, our regression analysis with the highest number of observations included 57,216 observations.

3.2 Financial inclusion

In line with recent studies which apply multidimensional approaches to measure financial inclusion (Koomson et al. 2020, 2021; Koomson and Danquah 2021; Zhang and Posso 2019), we use four financial inclusion indicators which double as the dimensions. These are bank account ownership, access to credit/loans, insurance ownership, and financial remittances (see Table A1). Using the formula specified in Equation 1 and a weight of 0.25 for each dimension, we calculate a multidimensional financial inclusion score for which a unit increase represents an improvement in financial inclusion. Following extant studies, we use a cut-off of 0.5 to construct a binary variable that takes the value 1 if the respondent's financial inclusion score is greater than 0.5 and 0 otherwise (Awaworyi Churchill and Marisetty 2020; Koomson and Danquah 2021; Zhang and Posso 2019). We carry out our main analyses using the multidimensional financial inclusion score, while the binary version is employed to check for robustness. In additional robustness testing, we utilize several weighting schemes and cut-offs for the binary indicator to confirm the consistency of our results (see Section 5.4).

$$FI_i = w_1 I_1 + w_2 I_2 + \cdots + w_n I_n \quad (1)$$

In Equation 1, FI_i is the financial inclusion score of an individual. $I_i = 1$ if an individual responds affirmatively to owning indicator i and 0 otherwise. W_i is the weight assigned to indicator i with $\sum_{i=1}^{n} w_i = 1$.

3.3 Ethnic diversity

Using NIDS data and applying the Herfindahl fractionalization index (Greenberg 1956), we compute ethnic diversity at the district level. The formula is as specified in Equation 2:

$$FRACTIONALIZATION_j = 1 - \sum_{i=1}^{i} n_{ij}^2 \quad (2)$$

where n_{ij} is the share of ethnic group i in district j. The ethnic fractionalization index (i.e., ethnic diversity) measures the probability that two randomly picked residents in a particular district belong to distinct ethnic groups. Ethnic groupings are determined based on the language respondents usually speak at home. This procedure has been used extensively in the literature (Alesina et al. 2003; Awaworyi Churchill 2020; Benier and Wickes 2016). In addition to the 11 official languages, the NIDS data include 'other languages', which makes a total of 12 languages throughout South Africa's 52 districts. Since languages define ethnic identity, we call our measure 'ethnic fractionalization'.

We conduct robustness checks using ethnic polarization, a conflict-based measure of diversity. We compute ethnic polarization using the Montalvo and Reynal-Querol (2005) formula, as stated in Equation 3:

$$POLARIZATION_j = 1 - \sum_{I=1}^{i} \left(\frac{0.5 - n_{ij}}{0.5}\right)^2 \cdot n_{IJ} \quad (3)$$

where n_{ij} is the share of ethnic group i in district j. Ethnic polarization refers to the distance between any distribution of ethnic groups that causes the most conflict. According to Montalvo

and Reynal-Querol (2005), ethnic diversity and conflict have a non-linear (inverted U-shaped) relationship. Ethnic polarization tends to be greater in areas where the distribution of ethnic groupings is closer. Table A2 provides a description and summary statistics for the variables used in the analysis.

4 Analytical procedure

We use ordinary least squares (OLS) to assess the relationship between ethnic diversity and financial inclusion, since both variables are continuous in nature. The baseline model is as stated in Equation 4:

$$FI_{ihjt} = \beta_1 EDiv_{jt} + \sum_n \gamma_n X_{n,iht} + \sum_n \lambda_n \mathrm{H}_{n,ht} + \vartheta_t + \varphi_p + \mu_{ihjt} \quad (4)$$

where FI_{ihjt} is the multidimensional financial inclusion score of individual i in household h in district j at time t. Time refers to each wave of the NIDS. $EDiv_{j,t}$ represents the level of ethnic diversity for district j at time t. X and H are vectors of individual- and household-level determinants of financial inclusion which have been identified and used in previous studies as control factors (Guiso et al. 2004; Iyer 2015; Sanderson et al. 2018; Xu 2020). These include gender, education, age, location, household size, and marital status. We also control for wave (ϑ_t) and province (φ_p) fixed effects, while μ captures the random error term.

4.1 Potential endogeneity

Extant studies have demonstrated that ethnic diversity is endogenous and, if left unaddressed, may produce biased estimates (Awaworyi Churchill and Danquah 2022; Koomson et al. 2022; Koomson and Awaworyi Churchill 2021). Consistent with these and other studies, we use a two-stage least squares (2SLS) model in which province-level ethnic diversity obtained from 1996 South African census data is employed as an instrument (see Akay et al. 2017; Awaworyi Churchill and Danquah 2022; Koomson et al. 2022; Koomson and Awaworyi Churchill 2021). In South Africa, the nine provinces sit at the top of the geopolitical administrative structure, followed by districts. Deriving ethnic diversity from an older census is ideal because such variables serve as a lag and thus ensure that the instrument is stronger (Dustmann et al. 2005; Hatton and Tani 2005). Such instruments also address problems of potential self-selection (Awaworyi Churchill et al. 2019; Glennerster et al. 2013). Our instrument is valid because it satisfies both the relevance and the exclusion restriction conditions.

Regarding relevance, we posit that existing patterns of ethnic diversity in districts are directly attributable to the historical pattern of ethnic variety at the province level. In other words, ethnic diversity is likely to be high for districts located in provinces with a history of highly diverse ethnic groups. The instrument also satisfies the exclusion restriction condition because historical levels of ethnic diversity (about 12 years ago) are not expected to directly influence current levels of financial inclusion. This instrument has been used widely in past studies (Awaworyi Churchill and Danquah 2022; Koomson et al. 2022; Koomson and Awaworyi Churchill 2021).

Robustness checks: Lewbel and control function approaches

Apart from the standard 2SLS model, the Lewbel (2012) 2SLS and control function (CF) 2SLS approaches are used to test the robustness of our main estimates. The Lewbel method uses heteroscedasticity in the data to produce internal instruments which can be used alone or combined with external instruments to resolve endogeneity (Kofinti et al. 2022; Lewbel 2012). In this study, we use the method that combines both internal and external instruments, as applied widely in extant studies (Kofinti et al. 2022; Koomson et al. 2021; Martey et al. 2022). The CF method is similar to the standard 2SLS procedure because both apply 2SLS to resolve endogeneity (Guo and Small 2016; Wooldridge 2015). This similarity notwithstanding, the CF approach predicts the residual of the first stage for use as an instrument, while the standard 2SLS method uses the predicted outcome of the first stage as an instrument (Guo and Small 2016; Wooldridge 2015). We also use alternative measures of financial inclusion based on different cut-offs (0.5 and 0.75) and a different measure of ethnic diversity (i.e., ethnic polarization) to test for robustness. The results for these methods and measures are reported in Section 5.4.

5 Results

5.1 Preliminary results

The preliminary (OLS) results showing the link between ethnic diversity and financial inclusion are reported in Table 1. We report both non-standardized and standardized coefficients for each variable, but the interpretation is done using the standardized ones in square brackets since they are easy to compare across models. Overall, we find that ethnic diversity is associated with an increase in financial inclusion. The results for the full sample are reported in Column 1, while male- and female-specific results are presented in Columns 2 and 3 respectively. Rural- and urban-specific results are also reported in Columns 4 and 5 respectively. Specifically, we observe in Column 1 that an increase in ethnic diversity of one standard deviation is associated with 0.042 standard deviation increases in financial inclusion.

The gender-based analyses in Columns 2 and 3 show that a one standard deviation increase in ethnic diversity is associated with 0.042 and 0.041 standard deviation increases in financial inclusion among men and women respectively. With regard to location, the results in Columns 4 and 5 suggest that a one standard deviation increase in ethnic diversity is linked to 0.028 and 0.060 standard deviation increases in financial inclusion among rural and urban residents respectively. We can infer that the effect of ethnic diversity on financial inclusion is larger for men and urban residents than for women and rural residents. These findings notwithstanding, OLS estimates may be biased due to endogeneity, so we estimate and discuss endogeneity-corrected results in Section 5.2.

Table 1: Ethnic diversity and financial inclusion (preliminary results)

	(1)	(2)	(3)	(4)	(5)
		Gender		Location	
Variables	**Full**	**Male**	**Female**	**Rural**	**Urban**
Ethnic fractionalization	0.028***	0.029***	0.027***	0.019***	0.044***
	(0.003)	(0.005)	(0.004)	(0.004)	(0.006)
	[0.042]	[0.042]	[0.041]	[0.028]	[0.060]
Female	−0.006***			−0.005**	−0.007***
	(0.001)			(0.002)	(0.002)
	[−0.016]			[−0.014]	[−0.017]
Educated	0.050***	0.054***	0.048***	0.045***	0.063***
	(0.002)	(0.004)	(0.003)	(0.003)	(0.005)
	[0.085]	[0.080]	[0.090]	[0.107]	[0.072]
Age	0.457***	0.487***	0.435***	0.378***	0.549***
	(0.023)	(0.037)	(0.030)	(0.026)	(0.040)
	[1.177]	[1.196]	[1.152]	[1.218]	[1.232]
Age squared	−0.063***	−0.068***	−0.060***	−0.052***	−0.077***
	(0.003)	(0.005)	(0.004)	(0.004)	(0.006)
	[−1.155]	[−1.166]	[−1.139]	[−1.184]	[−1.225]
Rural	−0.060***	−0.059***	−0.060***		
	(0.002)	(0.003)	(0.002)		
	[−0.163]	[−0.158]	[−0.168]		
Household size	−0.004***	−0.005***	−0.004***	−0.003***	−0.007***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
	[−0.082]	[−0.091]	[−0.075]	[−0.073]	[−0.100]
married	0.052***	0.056***	0.050***	0.039***	0.066***
	(0.002)	(0.003)	(0.002)	(0.002)	(0.003)
	[0.133]	[0.141]	[0.127]	[0.113]	[0.158]
Widowed/divorced/separated	0.011***	0.008**	0.012***	−0.008***	0.031***
	(0.002)	(0.004)	(0.003)	(0.003)	(0.004)
	[0.017]	[0.012]	[0.021]	[−0.016]	[0.046]
Wave fixed effect	Yes	Yes	Yes	Yes	Yes
Province fixed effect	Yes	Yes	Yes	Yes	Yes
Observations	57,216	24,665	32,551	28,546	28,670
R-squared	0.154	0.159	0.149	0.099	0.108

Note: robust standard errors in parentheses; standardized coefficients in square brackets; *** p<0.01, ** p<0.05, * p<0.1.

Source: authors' construction based on NIDS data (SALDRU multiple dates).

5.2 Endogeneity-corrected results

Table 2 shows the endogeneity-corrected estimates for the association between ethnic diversity and financial inclusion. Consistent with the *a priori* expectation, the first-stage results show a significant positive association between historical levels of ethnic diversity at the province level and current ethnic fractionalization at the district level. The positive association suggests that districts located in provinces with historically high levels of ethnic fractionalization are more likely to experience high rates of ethnic fractionalization in the present. The F-statistic for all the estimates is greater than 10, which means that the null hypothesis of weak instrument is rejected, based on the recommendation of Stock and Yogo (2005). Consistent with the baseline results, the 2SLS estimates show a positive association between ethnic fractionalization and financial inclusion. However, the estimates of the 2SLS are relatively higher than the OLS results, which suggests that

the preliminary results may be downwardly biased. In view of this, we focus on the 2SLS estimates in the discussion of the results.

Table 2: Ethnic diversity and financial inclusion (2SLS results)

	(1)	(2)	(3)	(4)	(5)
		Gender		Location	
Variables	**Full**	**Male**	**Female**	**Rural**	**Urban**
Ethnic fractionalization	0.101***	0.108***	0.097***	0.100***	0.106***
	(0.007)	(0.011)	(0.009)	(0.008)	(0.015)
	[0.150]	[0.156]	[0.145]	[0.143]	[0.145]
All controls	Yes	Yes	Yes	Yes	Yes
Wave fixed effect	Yes	Yes	Yes	Yes	Yes
Province fixed effect	Yes	Yes	Yes	Yes	Yes
First stage					
Ethnic fractionalization (1996PHC)	1.040***	1.021***	1.054***	1.237***	0.819***
	(0.008)	(0.012)	(0.011)	(0.008)	(0.013)
F-Statistic	17,078.47	7,122.84	9,981.74	21,214.74	3,851.12
Observations	57,216	24,665	32,551	28,546	28,670
R-squared	0.148	0.152	0.143	0.087	0.104

Note: robust standard errors in parentheses; standardized coefficients in square brackets; *** p<0.01, ** p<0.05, * p<0.1.

Source: authors' construction based on NIDS data (SALDRU multiple dates).

Considering Column 1, a one standard deviation increase in ethnic diversity is associated with an increase in financial inclusion of 0.150 standard deviations. This implies that ethnic diversity creates the opportunity for people from diverse ethnic backgrounds to learn from each other and be financially included. Relative to the pre-apartheid policy that restricted migration in South Africa, the post-apartheid reforms which made it legally possible for all South Africans, irrespective of their socioeconomic status, to migrate across towns, districts, and provinces (Henrard 2003) set the stage for the spread of knowledge, including financial capability. The policy reforms facilitated interaction across the population, thus fostering ethnic diversity and socioeconomic benefits as a corollary. Interaction among people from diverse ethnic backgrounds can promote financial inclusion among the hitherto financially excluded population within the same province and towns. This finding is consistent with that of Amin et al. (2023), who found a strong positive relationship between ethnic diversity at the national level and financial inclusion, but the present study is undertaken at the individual level.

Gender-wise, we see in Columns 2 and 3 that a one standard deviation increase in ethnic diversity is associated with 0.156 and 0.145 standard deviation increases in financial inclusion among men and women respectively. Our results reveal that men experience a relatively larger positive effect of ethnic diversity on financial inclusion. The results suggest that ethnic diversity may have benefited men more than women in terms of access to financial products and services. Since South Africa is beginning to experience a gender gap in financial inclusion against men (currently 1.6 per cent), promoting ethnic diversity could help to narrow the gender gap, since it increases financial inclusion more for men.

Focusing on location, the results in Columns 4 and 5 indicate that a one standard deviation increase in ethnic diversity is associated with 0.143 and 0.145 standard deviation increases in financial inclusion among rural and urban residents respectively. The results indicate that rural residents experience a relatively smaller positive impact of ethnic diversity on financial inclusion. The

plausible justification for this finding is that urban areas are more cosmopolitan, so urban residents have more opportunity to gain finance-related knowledge from people from highly diverse ethnic backgrounds. Such knowledge also helps them to navigate a complex financial ecosystem that includes diverse financial products and services.

5.3 Analysis of potential channels

In this section, we explore two potential mechanisms (employment opportunity and social group membership) through which ethnic fractionalization may influence financial inclusion, based on literature review and data availability. We apply the two-step procedure proposed in existing studies (Awaworyi Churchill 2020; Baron and Kenny 1986; Koomson and Awaworyi Churchill 2021). We hypothesize that ethnic diversity has the potential to create employment opportunities for less endowed and marginalized ethnic groups (Awaworyi Churchill and Danquah 2022; Hong and Page 1998). The employment opportunities derived can improve household income (Setati et al. 2019) and increase the level of financial inclusion (Xu 2020). Employment opportunities increase the probability of financial transactions and increase the chance of accessing credit from financial institutions. Ethnic diversity enhances cognitive adaptation to heterogenous environment (Bai et al. 2020; Ottaviano and Peri 2006; Trax et al. 2015). Individuals from diverse ethnic backgrounds are more likely to experience a variety of cultures, which relaxes prior stereotypes and increases social cohesion. Tables 3 and 4 present the results of the potential channel analysis.

Table 3: Effect of ethnic diversity on employment and social group membership

	(1)	(2)
Variables	**Employment opportunity**	**Social group membership**
Ethnic fractionalization	0.075***	0.014***
	(0.009)	(0.005)
	[0.044]	[0.015]
All controls	Yes	Yes
Wave fixed effect	Yes	Yes
Province fixed effect	Yes	Yes
Observations	57,216	57,152
R-squared	0.120	0.016

Note: robust standard errors in parentheses; standardized coefficients in square brackets; *** p<0.01, ** p<0.05, * p<0.1.

Source: authors' construction based on NIDS data (SALDRU multiple dates).

The first step involves direct estimation of the link between ethnic diversity, employment opportunity, and social group membership (see Table 3). We find that a one standard deviation increase in ethnic diversity is respectively associated with increases of 0.044 and 0.015 standard deviations in employment (Bai et al. 2020; Ottaviano and Peri 2006; Trax et al. 2015) and social group membership (Dutta and Mukherjee 2012; Karlan 2005). In the second stage, we include the employment and social group membership variables as extra controls in the main model, one at a time. The mediating variables (employment and social group membership) hold as mediators only if their inclusion in the main model causes the previously estimated coefficient of ethnic diversity to either decline in magnitude or become statistically insignificant. For the purpose of comparison with the results in Column 1 of Table 1, we use the same sample size and estimation method for the mediation analyses.

Table 4: Effect of mechanisms—employment opportunity and social group membership

	(1)	(2)
	Mediator: Employment opportunity	Mediator: Social group membership
Variables	**Financial inclusion**	**Financial inclusion**
Panel A: Results for mechanism		
Ethnic fractionalization	0.016***	0.026***
	(0.003)	(0.002)
	[0.024]	[0.041]
Employment opportunity	0.160***	
	(0.002)	
	[0.404]	
Social group membership		0.023***
		(0.003)
		[0.032]
All controls	Yes	Yes
Wave fixed effect	Yes	Yes
Province fixed effect	Yes	Yes
Observations	57,216	56,826
R-squared	0.298	0.157
Panel B: Results for comparison		
Ethnic fractionalization	0.028***	0.028***
	(0.003)	(0.003)
	[0.042]	[0.042]
All controls	Yes	Yes
Wave fixed effect	Yes	Yes
Province fixed effect	Yes	Yes
Observations	57,216	57,152
R-squared	0.154	0.155

Note: robust standard errors in parentheses; standardized coefficients in square brackets; *** p<0.01, ** p<0.05, * p<0.1.

Source: authors' construction based on NIDS data (SALDRU multiple dates).

The second stage of the mediation analyses is presented in Columns 1 and 2 of Panel A in Table 4. As expected, we observe that employment opportunities and social group membership are associated with improved financial inclusion. Comparing the ethnic diversity coefficients in Panel A with those in Panel B, we find that the inclusion in the model of employment status and social group membership reduces the magnitude of the effect of ethnic diversity on financial inclusion, by approximately sevenfold and fourfold for employment status and social group membership respectively. These results imply that employment opportunities and social group membership are important channels through which ethnic fractionalization increases financial inclusion.

5.4 Robustness checks

To check for the robustness of the standard 2SLS results we employ the Lewbel (2012) 2SLS method, which addresses the issue of endogeneity. We further address the endogeneity issue using the CF approach (Guo and Small 2016; Wooldridge 2015). In Column 1 of Table 5, we estimate the effect of ethnic diversity on financial inclusion using both the internally generated and the external historical measures of ethnic diversity. Our results show that a one standard deviation increase in ethnic diversity is associated with a 0.060 standard deviation increase in financial inclusion. Based on the CF approach (Column 2), we observe a 0.149 standard deviation increase in financial inclusion due to a one standard deviation increase in ethnic fractionalization. Consistent with our standard 2SLS estimate, we observed a relatively larger coefficient for the Lewbel and CF methods than for the preliminary estimates. The results suggest that the positive effect of ethnic diversity on financial inclusion is robust across different methods of addressing endogeneity.

Table 5: Ethnic diversity and financial inclusion (alternative 2SLS methods)

	(1)	(2)
Variables	Lewbel 2SLS	CF approach
Ethnic fractionalization	0.041***	0.101***
	(0.005)	(0.007)
	[0.060]	[0.149]
Residual		−0.098***
		(0.008)
		[−0.093]
All controls	Yes	Yes
Wave fixed effect	Yes	Yes
Province fixed effect	Yes	Yes
First stage		
Ethnic fractionalization (1996PHC)	0.635***	1.043***
	(0.009)	(0.007)
F-Statistic	4,411.88	21,692.52
Observations	57,216	57,216
R-squared	0.154	0.157

Note: robust standard errors in parentheses; standardized coefficients in square brackets; *** p<0.01, ** p<0.05, * p<0.1.

Source: authors' construction based on NIDS data (SALDRU multiple dates).

Second, we perform sensitivity tests to further check the robustness of our estimates using binary indicators of financial inclusion obtained using the two different cut-offs of 0.5 and 0.75. The results are reported in Table 6. We observe in Columns 1 and 2 that a one standard deviation increase in ethnic diversity increases financial inclusion by 0.058 and 0.018 standard deviations respectively.

Table 6: Ethnic diversity and financial inclusion (alternative measures: binary measures of financial inclusion with different cut-offs)

	(1)	(2)
Variables	**FI with cut-off: 0.5**	**FI with cut-off: 0.75**
Ethnic fractionalization	0.106***	0.020***
	(0.010)	(0.006)
	[0.058]	[0.018]
All controls	Yes	Yes
Wave fixed effect	Yes	Yes
Province fixed effect	Yes	Yes
Observations	57,216	57,216
R-squared	0.147	0.071

Note: robust standard errors in parentheses; standardized coefficients in square brackets; *** p<0.01, ** p<0.05, * p<0.1.

Source: authors' construction based on NIDS data (SALDRU multiple dates).

Third, we employ a different measure of ethnic diversity—ethnic polarization—and re-estimate the effect of ethnic diversity on financial inclusion (Table 7). This measure is considered appropriate especially within the context of South Africa, with its large racial groups. Columns 1 and 2 report results for the effect of ethnic polarization on financial inclusion, measured using cut-offs of 0.5 and 0.7 respectively. These columns show that ethnic polarization is associated with 0.025 and 0.007 standard deviation increases in financial inclusion. We can infer that the effect of ethnic diversity on financial inclusion is consistently positive irrespective of the measurements of ethnic diversity and the cut-offs used in the construction of financial inclusion.

Table 7: Ethnic diversity and financial inclusion (alternative measure of diversity)

	(1)	(2)
Variables	**FI with cut-off: 0.5**	**FI with cut-off: 0.75**
Ethnic polarization	0.043***	0.008*
	(0.007)	(0.004)
	[0.025]	[0.007]
All controls	Yes	Yes
Wave fixed effect	Yes	Yes
Province fixed effect	Yes	Yes
Observations	57,216	57,216
R-squared	0.145	0.071

Note: robust standard errors in parentheses; standardized coefficients in square brackets; *** p<0.01, ** p<0.05, * p<0.1.

Source: authors' construction based on NIDS data (SALDRU multiple dates).

6 Conclusion

In this study, we examine how ethnic diversity affects financial inclusion in South Africa, taking into account the endogeneity of ethnic diversity and the possible mediating effects of employment opportunities and social group membership. We conceptualize ethnic diversity using fractionalization and polarization approaches, while financial inclusion is measured from a multidimensional perspective. We instrument district-level ethnic diversity using province-level diversity obtained from an older census. Other endogeneity-correcting methods are employed to ensure robustness in findings.

We find that carefully designed policies aimed at promoting ethnic diversity will go a long way to boosting financial inclusion in post-apartheid South Africa. Gender-wise, we find that men enjoy a higher beneficial impact of ethnic diversity on financial inclusion, which signals that ethnic diversity can be promoted as a viable policy to close the emerging gender gap in financial inclusion, which favours women. Regarding location, we establish that ethnic diversity improves financial inclusion more for urban inhabitants than for rural residents. Based on the gender- and location-specific findings, we suggest that deliberate attempts be made to make financial services and products more accessible to women and rural residents.

Our results also reveal that greater employment opportunities and social group membership are potential pathways via which ethnic diversity increases financial inclusion. In essence, promoting cultural mixing has the potential to increase the availability of employment opportunities and social group membership, which are both positive elements for the spread of financial knowledge and the diffusion of knowledge of the financial technologies that have become increasingly paramount in recent finance landscape. This study is limited by the number of potential mechanisms that we could explore due to data constraints. We urge future researchers on this topic to explore other potential pathways that are relevant to their context.

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Appendix

Table A1: Dimensions and indicators of weights of multidimensional financial inclusion

Dimension (weight)	Description
Bank account (1/4)	Respondent owns a bank account
Loan/credit (1/4)	Respondent has access to credit or has access to loan/credit from formal institution
Insurance (1/4)	Respondent has insurance
Financial remittance (1/4)	Respondence has sent or received financial remittance

Source: authors' construction based on NIDS data (SALDRU multiple dates).

Table A2: Summary statistics

Variable	Description	Mean	Std dev.
Financial inclusion (Multidimensional Poverty Index/MPI score)	Continuous variable for respondent's multidimensional financial inclusion score	0.390	0.183
Financial inclusion (cut-off: 0.5)	Binary variable equals 1 if respondent's multidimensional financial inclusion score is greater than or equal to 0.5	0.441	0.497
Financial inclusion (cut-off: 0.75)	Binary variable equals 1 if respondent's multidimensional financial inclusion score is greater than or equal to 0.75	0.106	0.308
Ethnic fractionalization	District-level ethnic fractionalization index (NIDS data)	0.343	0.270
Ethnic polarization	District-level ethnic polarization index (NIDS data)	0.324	0.330
Female	Binary variable equals 1 if respondent is female	0.569	0.495
Educated	Binary variable equals 1 if respondent is educated	0.892	0.311
Age	Age of the respondent	3.514	0.471
Age squared	Age of the respondent squared	12.567	3.330
Rural	Binary variable equals 1 if respondent is located in a rural area	0.499	0.500
Household size	Number of persons in respondent's household	5.471	3.542
Married	Binary variable equals 1 if respondent is married	0.318	0.466
Widowed/divorced/ separated	Binary variable equals 1 if respondent is widowed/divorced/separated	0.100	0.300
Employment opportunity	Binary variable equals 1 if respondent is employed	0.308	0.462
Social group membership	Binary variable equals 1 if respondent is a member of a social group	0.927	0.259
LFRACprov96	Province level ethnic fractionalization index (1996 PHC data)	0.381	0.170

Source: authors' construction based on NIDS data (SALDRU multiple dates).