**Path to achieving SDG 8: Do worker remittances reduce vulnerable employment?**

# Abstract

**Purpose**: The prevalence of high levels of vulnerable employment in developing countries poses a formidable obstacle to their progress towards achieving SDG 8. While worker remittances (remittances) are widely recognised as a potential source of improving the welfare of people experiencing poverty, their effectiveness in alleviating vulnerable employment from a macro perspective remains unclear. Consequently, the study examines the impact of remittances on reducing vulnerable employment.

**Methodology**: The study uses macro-level data from 73 developing countries covering 1990-2021. Vulnerable employment is measured in three forms: total, male, and female. Remittances are measured as a percentage of the gross domestic product. The findings are empirically analysed using dynamic panel data estimation techniques. A two-stage least squares (IV 2SLS) approach addresses remittance endogeneity.

**Findings**: Two key findings emerge from the study. First, increased remittances are associated with a decline in the total share of workers resorting to vulnerable employment, albeit a modest decline. Second, the remittance surge is associated with more males than females leaving vulnerable employment, indicating its gender-specific effects. These findings remain robust to several checks.

**Policy Implications**: The study's findings underscore the potential of leveraging remittances to reduce vulnerable employment. To this end, selective and targeted policy interventions that promote financial literacy and inclusion, which serve as the cornerstones for effectively utilising remittances, are advised.

**Originality**: To the best of my knowledge, this study is the first to examine the impact of remittances on vulnerable employment on a macro scale. As such, the study makes a novel contribution to understanding how remittances serve as an enabler for SDG 8.

JEL classification: E24, F24, J21

Keywords: worker remittances, vulnerable employment, developing countries, SDG 8

# Introduction

Goal 8 of the Sustainable Development Goals (SDGs) articulated by the United Nations (UN) aims to provide decent employment to all by 2030 (United Nations, 2015). Despite decades of efforts by developing countries to provide decent employment for all, vulnerable employment remains a significant challenge (OECD/ILO, 2019, ILO, 2018a) (see figures 1-3). The World Bank (2022) defines vulnerable employment as the sum of own-account workers and contributing family workers. Due to the precarious working conditions under which they work, as well as the pittance returns they earn, and the lack of social protection, these two groups of workers are classified as vulnerable (Lo Bue et al., 2022, Yerrabati, 2022, Gammarano, 2018). These workers work on their own accounts and rely on other household members for assistance, highlighting their plight. This type of employment which arises from necessity rather than choice, falls outside the scope of the four pillars of decent employment (Gammarano, 2018, ILO, 2018b, OECD/ILO, 2019) [[[1]](#endnote-2)].

While vulnerable employment is viewed as a safety net for the poor, its prevalence not only challenges the efforts of developing countries in achieving SDG 8, but it also has profound implications for achieving other SDGs, such as reducing poverty (SDG1), gender equality (SDG 5), inequalities (SDG 10) and social unrest and instability (SDG 16) (OECD/ILO, 2019). As a result, the long-term persistence of vulnerable employment is undesirable from a welfare perspective. Thus, addressing vulnerable employment remains a key policy challenge.

For many developing countries, worker remittances (remittances) sent back home by international migrant workers to their family members have become a significant source of external finance (Adams and Page, 2005, Acosta et al., 2008, Sobiech, 2019, De et al., 2016) (see figures 4 and 5). Globally, over $794 billion in workers' remittances were sent via official channels in 2022, and billions more were likely sent through unofficial channels. The corresponding figure for developing countries stood at $626 billion, nearly twice as large as the level of foreign aid and thrice the size of direct investment flows (Broom, 2023) [[[2]](#endnote-3)]. Remittances inflows into developing countries on the scale described above can be expected to potentially have a significant impact on reducing vulnerable employment. Nonetheless, despite their ever-increasing economic importance (Finkelstein Shapiro and Mandelman, 2016, Broom, 2023) and undeniable relevance to labour markets (Woodruff and Zenteno, 2007), little is known about their impact on vulnerable employment.

Examining the effects of remittances on vulnerable employment is vital for two reasons: First, examining such effects provides insight into the complex dynamics at play, which helps explain how these financial flows either mitigate or exacerbate vulnerable employment. This is particularly important for designing targeted interventions that will assist developing countries in achieving SDG 8 by alleviating vulnerable employment. Second, given the importance that policymakers and development economists alike increasingly place on remittances as a potential source of improving the welfare of the poor, it is critical to know whether such optimism holds in reducing vulnerable employment. Accordingly, this study examines the effects of remittances on vulnerable employment using macro-level data from 73 developing countries from 1990-2021.

*1.1: Contributions to the literature*

In examining the effects of remittances on vulnerable employment, the study bridges two important areas of research in development economics, and as such, its contributions are two-fold. The study foremost contributes to the rich strand of literature that assessed the welfare gains of remittances to recipient countries along various dimensions, including poverty (Acosta et al., 2008, Adams and Page, 2005), inequality (Acosta et al., 2008), financial development (Giuliano and Ruiz-Arranz, 2009, Aggarwal et al., 2011, Gupta et al., 2009), education (Yang, 2011, Acosta et al., 2008), investments (Taylor, 1992, Gupta et al., 2009), labour markets (Woodruff and Zenteno, 2007) and economic growth (Giuliano and Ruiz-Arranz, 2009, Mundaca, 2009). Several studies have also highlighted moral hazard problems associated with remittances (Chami et al., 2003, Guha, 2013, Gupta et al., 2009). While these studies provide robust insights into the effects of remittances on developing countries' socioeconomic dynamics, they do not contribute to our understanding of how remittances affect vulnerable employment.

Second, the study contributes to the small but thriving line of literature on informal employment (Yerrabati, 2023, Yerrabati, 2022, Fields, 2019, Gammarano, 2018, OECD/ILO, 2019, Lo Bue et al., 2022). While these studies have delved into the causes and consequences of such employment, studies examining remittances as a potential tool to address such problems are new. This study contributes to these two strands of literature by underscoring the critical importance of remittances for alleviating vulnerable employment.

*1.2: Theoretical considerations on remittances and vulnerable employment*

To our knowledge, the extant literature does not offer direct evidence of the nexus between remittances and vulnerable employment. However, the wider literature on remittances implicitly suggests two distinct pathways through which remittances may affect vulnerable employment: the dependency-reducing effect and the growth-enhancing effect.

A dependency-reducing effect is when remittances accruing to those dependent on vulnerable employment reduce their dependence on such employment by easing their financial constraints. Several studies observed that those at the bottom of the economic ladder experience high-income uncertainties and have few viable alternatives to smooth out their consumption needs (Banerjee and Duflo, 2014, Karlan and Zinman, 2010, Banerjee et al., 2015, Karnani, 2007, Adams and Page, 2005). Studies have also shown remittances to ease financial constraints for the poor and serve as a safety net (Ratha, 2020, Ratha and Shaw, 2007, Spatafora, 2005, Amuedo-Dorantes and Pozo, 2011). Following these two lines of literature, it is evident that remittances reduce the dependency of the poor on vulnerable employment by serving as a reliable source of income and an immediate source of relief from financial constraints, two of the very reasons why the poor resort to vulnerable employment.

The growth-enhancing effect refers to the situation where remittances accruing to entrepreneurs and wage earners, through its wider welfare impact, tend to create more employment opportunities (Bahadir et al., 2018). Studies have shown that remittances increase economic investments (Taylor, 1992, Gupta et al., 2009). Additionally, they are shown to stimulate business opportunities among the remittance-receiving households (Yang, 2011, Woodruff and Zenteno, 2007), make the domestic economy less volatile (Chami et al., 2009), increase the financial development (Giuliano and Ruiz-Arranz, 2009, Aggarwal et al., 2011, Gupta et al., 2009) and promote economic growth (Giuliano and Ruiz-Arranz, 2009, Mundaca, 2009). To the extent that remittances improve these fronts, they create a favourable environment where more employment opportunities for all households – including the non-recipient households are created. As more employment opportunities become available, they are likely to reduce aggregate levels of vulnerable employment.

A priori, however, the relative magnitude of these effects is difficult to predict as they depend critically on the circumstances of the receiving households and how well they are channelled towards reducing such employment, both of which fall beyond the scope of the study. For instance, if the majority of the receiving households are the ones engaged in vulnerable employment, then the dependency-reducing effect might have a more significant impact than otherwise would be the case. Furthermore, none of the two effects needs to materialise, and remittances may not impact vulnerable employment due to the moral hazard problem (Chami et al., 2003). A moral hazard problem arises when households divert the remittances towards leisure (Guha, 2013) or conspicuous consumption (Gupta et al., 2009). Consequently, efforts to reduce dependence on vulnerable employment might be hampered, perpetuating the cycle of vulnerability. The remainder of the paper is organised as follows. Section 2 details the methodology employed in the study, followed by Section 3, discussing the findings. The final section concludes the paper by outlining the necessary policy implications.

# 2. Methodology

*2.1: Model specification*

The estimation below examines the effects of remittances on vulnerable employment.

(1)

Where represents the total, male and female levels of vulnerable employment in a country in year ; represents the personal remittances received as a percentage of gross domestic product. measures the effect of remittances on vulnerable employment levels. represents the set of control variables widely recognised to affect informal labour markets in developing countries. is the time-specific effect and is the country-specific effect; represents the error term. accounts for the persistence of vulnerable employment, as ILO (2002) and Gammarano (2018) observed.

Since is positively related to , the estimation of by Ordinary Least Squares (OLS) and Fixed Effects Estimation (FEE) will be biased (Arellano and Bond, 1991). To obtain unbiased estimates of , the system GMM approach proposed by Arellano and Bover (1995) and Blundell and Bond (1998) is used. In addition to using the approach because of its inherent advantages, the approach is also suitable in the current study as it controls for cross-country heterogeneity and as the number of periods is less than the number of countries (Roodman, 2009a). As a convention, the instrument proliferation is corrected using the collapse option (Roodman, 2009b), and bias associated with the small sample is corrected using the Windmeijer (2005) correction. The consistency of the estimates obtained using the approach is validated using the Arellano and Bond (1991) AR (2) and the Hansen (1982) test.

Potential endogeneity bias because of simultaneity and spurious correlation is a cause of concern when examining the effects of remittances on vulnerable employment. As much as remittances affect vulnerable employment, high levels of such employment may induce migrants to send more remittances home. Studies by Stark and Taylor (1991) and Munshi and Rosenzweig (2016) provide the basis for this argument. A two-stage least square instrumental variable (IV 2SLS) approach is used to address endogeneity associated with remittances. Furthermore, all variables on the right-hand side of equation (1) are lagged by one period to show the causation flowing from remittances to vulnerable employment.

*2.2: Data and sources*

Data for the study is retrieved from 73 developing countries observed between 1990 and 2021 and transformed into four-year non-overlapping averages. By averaging the data, the study aims to eliminate short-term fluctuations and focus on the long-term effects of remittances on vulnerable employment. Because remittances and vulnerable employment tend to remain broadly stable over time, averaging the data does not result in the loss of information. Tables 1 and 2 in the Appendix provide a list of variables (along with the data sources) and countries included in the study, respectively.

Following the broader literature on remittances and vulnerable employment, several control variables are included in the analysis. By increasing the number of gainful employment opportunities, foreign direct investments and growth are expected to reduce vulnerable employment (ILO, 2017, Kaulihowa and Adjasi, 2018). Similarly, education can potentially reduce vulnerable employment by improving the quality of labour (Bonal, 2016). The impact of government spending is unclear as redistribution policies through taxes and social benefits may or may not mitigate unemployment (Feldmann, 2010).

Due to the greater burden of supporting those unable to work, households with a high age dependency ratio are more likely to be in vulnerable employment (Duval-Hernández, 2021). By creating a conducive environment for the creation of more gainful employment opportunities, democracy is expected to reduce vulnerable employment (Rodrik, 1999). Evidence suggests that agriculture is where vulnerable employment is most prevalent (Lo Bue et al., 2022, Chen et al., 2023).

# 3. Findings

*3.1: Descriptive statistics and correlation analysis*

A summary of the descriptive statistics and correlation analysis for the variables used in the study is provided in Tables 3 and 4 of the Appendix, respectively. The mean values of the total, male and female vulnerable employment are 50.58 per cent, 46.75 per cent and 56 per cent, respectively, suggesting that many people rely on such employment for survival. In line with Lo Bue et al. (2022), the figures also indicate that more females than males are in this form of employment. With a mean value of 4.32 per cent, remittances appear to be an essential source of external financing for development. The correlation matrix does not indicate any multicollinearity issue, which is confirmed using the variance inflation factor (VIF)[[3]](#endnote-4).

*3.2: Regression analysis*

Table 5 presents the results of the two-step system GMM for the equation presented in equation (1). Panel A in the table presents the estimation results, and panel B presents the diagnostic test results. In panel B, Arellano and Bond (1991), AR (2) and Hansen (1982) confirm that there is no second-order serial correlation and the over-instrumentation problem is minimised. In panel A of Table 5, column 1 shows the estimates of total vulnerable employment, while columns 2 and 3 show the male and female vulnerable employment results. In all three estimations, the parameter estimates of the lagged dependent variable are less than one, positive, and statistically significant, suggesting that vulnerable employment persists over time (Gammarano, 2018, ILO, 2002).

Two significant contributions of the study can be noted in Table 5. First, the parameter estimates of remittances across all three estimations in columns 1-3 of the table are statistically significant and bear a negative sign. The coefficient in column 1 is -0.035, suggesting that, on average, a one per cent increase in remittances as a percentage of gross domestic product results in a 0.035 per cent reduction in the total vulnerable employment. In other words, the proliferation of remittances is associated with the fall in the share of people relying on vulnerable employment.

In addition to supporting the theoretical considerations in section 1.2, these findings echo the welfare-enhancing effects of remittances observed by Adams and Page (2005), Acosta et al. (2008), Fajnzylber and López (2008) and Gupta et al. (2009). The magnitude of the effect suggests that, at best, remittances can relieve only a small share of poor people by freeing them from the clutches of vulnerable employment. Such effects, however, are at odds with the importance that policymakers and development practitioners increasingly place on remittances as a potential source of supporting people experiencing poverty. There are three possible explanations for such modest effects.

As discussed in section 1.2, one possible explanation could be due to the moral hazard problem. The moral hazard problem implies that due to the perceived safety net provided by remittances, recipients may be less motivated to invest in skill development or seek gainful employment (Chami et al., 2003, Guha, 2013, Gupta et al., 2009). The impact of remittances on reducing vulnerable employment will, therefore, be limited. The limited impact could also be attributed to inadequate institutions in developing countries (Aggarwal et al., 2011). Such an inadequacy inhibits the efficient allocation of remittances or skill development and job creation. The third explanation may be the high cost of remitting money home. Migrants from poor households are likelier to remit through private and unofficial channels (Ratha, 2020, Adams and Page, 2005, Gupta et al., 2009). Such flows are unlikely to be captured by the data provided by the World Bank that is used in the current study. For this reason, the full impact of remittances on vulnerable employment needs more accurate data on the large and currently unknown level of remittances, which future research might explore.

Whilst the modest effects may fail to meet the lofty expectations of policymakers to mitigate vulnerable employment using remittances, it is pertinent to underscore that the findings do not, by any means, imply that remittances are ineffectual in addressing the issue in its entirety. On the contrary, the effects indicate that remittances in their present state cannot be deemed a formidable enabler in mitigating vulnerable employment on a significant scale. Rather, the results should lead policymakers to reconsider their optimistic views of remittances and explore the intriguing possibility of using them to alleviate vulnerable employment on a substantial scale.

Second, from columns 2 and 3 of Table 5, we note that while the estimate of male vulnerable employment is -0.049, the corresponding figure for females is -0.038. This observed difference suggests that while a one per cent increase in remittances is associated with a 0.049 per cent reduction in the share of males in vulnerable employment, a similar increase in remittances is associated with a reduction of 0.038 per cent in the share of females in vulnerable employment. Thus, while remittances are found to free both male and female workers from the clutches of vulnerable employment, based on the magnitude of the effect, we can conclude that higher returns are obtained in the case of males than their female counterparts. Two possible explanations exist as to why the effects are gender specific.

One possible explanation can be attributed to sociocultural norms in developing countries that place greater emphasis on the males' earnings to ensure the household's financial stability (Wegren et al., 2017, Magidimisha and Gordon, 2015). Due to this, remittances may be primarily used to free males from such employment, providing them with opportunities to find better jobs, pursue further education or start a productive business. Another possible reason could be females' low returns in vulnerable employment. Although more females than males are employed in vulnerable employment, several studies have observed that females are confined as contributing family workers (Gindling and Newhouse, 2014, Otobe, 2017). Additionally, due to the double pay disadvantage they face in the labour market, they receive meagre pay compared to male workers (OECD/ILO, 2019). Consequently, lower opportunity costs associated with such earnings may result in households using remittances to free more males from vulnerable employment than females.

In terms of the control variables, growth reduces vulnerable employment (ILO, 2017). These findings suggest that developing countries aiming to reduce vulnerable employment should prioritise fostering their growth. At odds with the literature (Bonal, 2016), education has a positive and statistically significant effect on all three forms of vulnerable employment. The findings, however, should be interpreted cautiously, as they do not, in any way, imply that education pushes one into vulnerable employment. Instead, the findings suggest that, in the absence of alternative sources of income, education seems to support people experiencing poverty by allowing them to engage in some form of employment to survive.

A positive and statistically significant association between age dependency ratio and vulnerable employment suggests that more significant pressure on the workforce to support dependents increases vulnerable employment (Duval-Hernández, 2021). The impact of government spending, foreign direct investments, and democracy varied with the form of vulnerable employment, underscoring the necessity for a more gender-specific approach to address the issue. The rest of the variables have no impact on vulnerable employment.

*3.3: Robustness checks*

A battery of robustness checks has been used to assess the validity of the findings obtained in Table 5. The first check involved re-estimating equation (1) using IV 2SLS with the economic conditions of the top five migrant countries used as instruments (Acosta et al., 2008, Fajnzylber and López, 2008)[[4]](#endnote-5). The rationale behind using the data from the top five migrant countries instead of the top five remittance-sending countries is the lack of bilateral data on remittances, making it difficult to identify the top remittance source countries for each of the sample countries (Azizi, 2018). In making such a choice, following Barajas et al. (2009) and Azizi (2018), an assumption is made that the top five remittance-sourcing countries are the same as the top five migrant-receiving countries.

The following procedure is adopted when constructing the instruments for remittances. First, data from the UNDESA (2020) trends on international migrant stock is used to identify the top five migrant countries for each sample country. Data on the economic conditions of these countries, i.e., gross domestic product, population growth and unemployment, are obtained from the World Development Indicators. One can infer from Acosta et al. (2008), Azizi (2018) and Fajnzylber and López (2008) that these indicators are expected to play an important role in terms of how many migrants are allowed and, consequently, how much migrants remit to home countries.

The instruments are then constructed by calculating the weighted average of these variables, with weights being the inverse of the distance between the migrant-receiving and migrant-sending countries. Gravity model literature has shown that the distance between the countries significantly impacts transaction costs and ties to home, rendering it an appropriate factor in constructing remittance instruments (Barajas et al., 2009, Fajnzylber and López, 2008, Lueth and Ruiz-Arranz, 2006). As countries become farther apart, transaction costs increase, and interactions become less frequent, which in turn affects the flow of remittances. By using the inverse of distance, the study captures exogenous variation in remittances independent of potential confounding factors. These instruments are validated using the Kleibergen-Paap rk LM statistic, the Kleibergen-Paap rk Wald F statistic, the Hansen J statistic, and the endogeneity test.

The second robustness check involved re-estimating equation 4, including year dummies, to account for the time-specific effects. Studies have demonstrated remittances to vary according to region and income levels (Acosta et al., 2008, Adams and Page, 2005). To account for these, the third and fourth checks involved including regional and income dummies, each in separate estimations[[5]](#endnote-6). To ensure that the results are not susceptible to a specific measure that is used in Table 5, the fifth check involved using several alternate measures of remittances[[6]](#endnote-7). To ensure the stability of the findings over different aggregation intervals, the next check involved using five yearly averages. The data is limited to 1990-2019 to ensure equal intervals of five years.

The full sample included countries with varying levels of vulnerable employment ranging from less than 10 per cent to more than 90 per cent. The overall findings are likely to be influenced by these extreme levels. Therefore, the final check involved undertaking three separate estimations, each excluding countries with vulnerable employment of less than 10 per cent, more than 90 per cent and both[[7]](#endnote-8). The overall conclusions drawn in Table 5 remain intact to the above checks, indicating their reliability and consistency. Both regional and income dummies lacked statistical significance, suggesting that the results did not differ based on region or income levels. There could be several reasons, including the broad-based nature of how households utilise remittances, regardless of a country's income level or region. Additionally, the increasing interconnectedness of global economies may contribute to labour market convergence across economies, regardless of income level and region. Future research might want to explore these in more detail. Refer to the online Appendix for robustness check results (Tables 8-14c).

# 4. Concluding remarks

Remittances and vulnerable employment constitute a critical source of income for many poor in developing countries. In light of policymakers' growing significance on remittances to improve the welfare of people experiencing poverty, this study examines whether such optimism holds in the case of vulnerable employment. Macro-level data from 73 developing countries from 1990-2021 is used. On an empirical basis, the findings are analysed using dynamic panel data estimation methods and validated using several robustness checks. To the best of our knowledge, the study presents the most reliable macro-level evidence to date on remittance and vulnerable employment relationships.

Two novel findings and corresponding policy implications emerge from the study. Prima facie, the findings suggest a negative association between remittances and vulnerable employment. In other words, increased remittances to developing countries are associated with a fall in the overall share of the poor relying on such employment. Nonetheless, such effects are modest and not transformational. While the modest effects may fall short of policymakers' lofty aspirations of using remittances to address the issue, tackling the underlying causes for such moderate effects is a way forward to harness the true potential of remittances as a catalyst for achieving SDG8. Second, increased remittances are associated with more males than females leaving vulnerable employment, indicating gender-specific effects. This conclusion is drawn based on the magnitude of the coefficients. Due to methodological constraints, no statistical analysis was undertaken to determine whether the observed difference was statistically significant. Therefore, caution must be exercised when interpreting this finding. Among the control variables, growth has a negative, robust, and statistically significant impact on three forms of vulnerable employment, while education and age dependency ratio have significant positive impacts.

In terms of the policy implications, the priority should be on leveraging remittances to reduce vulnerable employment. To this end, selective and targeted initiatives promoting financial literacy and inclusion that serve as the cornerstone for effectively utilising remittances are needed (Giuliano and Ruiz-Arranz, 2009, Gupta et al., 2009, Sobiech, 2019). By fostering financial literacy, individuals can be encouraged to invest in productive ventures that stimulate sustainable economic growth, create gainful employment opportunities, and reduce vulnerable employment. Amplifying these effects necessitates interventions promoting increased access to financial services. Expanding access to financial services such as credit, savings, and insurance will encourage individuals to invest in education and skill development, which are much-needed initiatives in developing countries to bolster economic resilience and alleviate vulnerable employment.

While the policies mentioned above may result in some improvements, significant reductions in vulnerable employment are unlikely unless structural deficiencies in the labour market and rigid employment laws, attributed as the primary cause of vulnerable employment, are addressed (OECD/ILO, 2019, Gammarano, 2018). Any attempt to utilise remittances to reduce vulnerable employment without addressing these underlying problems may fail to yield the desired results. In addition to addressing these issues, formalising vulnerable employment by removing legal and administrative barriers should be viewed as a way to ensure sustained and inclusive growth that ensures better lives for these workers. Secondly, policymakers should prioritise interventions that address gender-specific effects of remittances that disadvantage females. Targeted interventions aimed at promoting gender-sensitive programs that empower females with financial literacy and inclusion can be seen as a way forward to achieving gender-equitable socioeconomic outcomes.

For future research, one relevant and interesting issue to explore would be to investigate why developing countries experience only modest reductions in vulnerable employment despite receiving substantial remittances. To this end, one could examine how recipient households use remittances, providing valuable insights into the factors influencing their ability to come out of vulnerable employment. Additionally, this study abstracted from several important country characteristics that may have significant implications on the relationship between remittances and vulnerable employment. One issue of particular importance is the share of workers employed in different sectors. This is relevant because, for instance, the workers employed in agriculture may utilise remittances to improve their productivity but not necessarily leave such employment as otherwise would be the case with workers in other sectors. Capturing the true effects of remittances on vulnerable employment requires considering these aspects.

# Data availability statement

The data supporting the study findings are available from the corresponding author upon reasonable request.

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**Conflict of interest**

There are no conflicts of interest to declare.

**Appendix**

**Table 1: Definitions of the variables used in the study and their data source**

|  |  |  |
| --- | --- | --- |
| *Variable* | *Definition* | *Data source* |
| *vul\_tot* | Total vulnerable employment as a percentage of total employment | World Development Indicators |
| *vul\_male* | Male vulnerable employment as a percentage of male employment | World Development Indicators |
| *vul\_fem* | Female vulnerable employment as a percentage of female employment | World Development Indicators |
| *remit* | Personal remittances received as a percentage of gross domestic product | World Development Indicators |
| *growth* | Annual percentage growth in gross domestic product growth | World Development Indicators |
| *edu* | Average years of secondary schooling | Barro and Lee |
| *govt* | Annual percentage growth in general government final consumption expenditure | World Development Indicators |
| *pop* | Rural population as a percentage of the total population | World Development Indicators |
| *lnfdi* | Natural logarithm of Foreign direct investment, net inflows in the balance of payments, current US dollars | World Development Indicators |
| *age* | The age dependency ratio, young as the percentage of the working-age population | World Development Indicators |
| *dem* | Democracy index. A score of -10 represents the least democratic country, and a score of +10 represents a country with the highest level of democracy. | Polity IV |
| *agr* | Employment in agriculture as the percentage of total employment (modelled ILO estimate) | World Development Indicators |

Source: Compilation of data from multiple sources as listed in the third column

**Table 2: List of countries included in the study**

|  |
| --- |
| **East Asia and Pacific** - Cambodia, Indonesia, Korea, Rep., Lao PDR, Malaysia, Mongolia, Myanmar, Papua New Guinea, Philippines, Singapore, Thailand, Viet Nam.  **Europe and Central Asia** – Turkiye.  **Latin America and the Caribbean** - Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Paraguay, Peru, Venezuela, RB.  **The Middle East and North Africa** - Algeria, Egypt, Arab Rep., Iran, Islamic Rep., Israel, Kuwait, Morocco, Qatar, Saudi Arabia, Syrian Arab Republic, Tunisia.  **South Asia** - Bangladesh, India, Nepal, Pakistan, Sri Lanka.  **Sub-Saharan Africa -** Benin, Botswana, Burundi, Cameroon, Congo, Dem. Rep., Congo, Rep., Cote d'Ivoire, Eswatini, Gabon, Gambia, The, Ghana, Kenya, Lesotho, Mali, Mauritania, Mauritius, Mozambique, Namibia, Niger, Rwanda, Senegal, Sierra Leone, Sudan, Tanzania, Togo, Uganda, Zimbabwe. |

Source: World Bank country classification by region

**Table 3: Descriptive statistics of the variables included in the study**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| *Variables* | *No of observations* | *Mean value* | *Standard deviation* | *Minimum value* | *Maximum value* |
| *vul\_tot* | 371 | 50.58 | 23.91 | 0.1 | 94.3 |
| *vul\_male* | 371 | 46.75 | 21.77 | 0.1 | 91.6 |
| *vul\_fem* | 371 | 56.00 | 27.09 | 0.0 | 97.9 |
| *remit* | 369 | 4.32 | 6.39 | 0.0 | 57.0 |
| *growth* | 370 | 3.76 | 2.55 | -11.1 | 12.2 |
| *edu* | 371 | 2.16 | 1.25 | 0.1 | 5.8 |
| *govt* | 368 | 5.26 | 5.77 | -13.7 | 64.6 |
| *pop* | 371 | 48.45 | 22.67 | 0.0 | 90.0 |
| *lnfdi* | 361 | 20.66 | 1.99 | 14.0 | 25.3 |
| *age* | 371 | 58.59 | 20.11 | 16.2 | 106.4 |
| *dem* | 370 | 3.34 | 5.57 | -10.0 | 10.0 |
| *agr* | 371 | 35.08 | 21.15 | 0.4 | 89.6 |

Source: Own estimates using data from sources listed in Table 1. Coverage: 1990-2021 period.

**Table 4: Correlation analysis for the variables included in the study**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *Variables* | *vul\_tot* | *vul\_male* | *vul\_fem* | *remit* | *growth* | *edu* | *govt* | *pop* | *lnfdi* | *age* | *dem* | *agr* |
| *vul\_tot* | 1 |  |  |  |  |  |  |  |  |  |  |  |
| *vul\_male* | 0.989\*\*\* | 1 |  |  |  |  |  |  |  |  |  |  |
| *vul\_fem* | 0.979\*\*\* | 0.944\*\*\* | 1 |  |  |  |  |  |  |  |  |  |
| *remit* | 0.108\* | 0.077 | 0.142\*\* | 1 |  |  |  |  |  |  |  |  |
| *growth* | 0.281\*\*\* | 0.284\*\*\* | 0.282\*\*\* | -0.090 | 1 |  |  |  |  |  |  |  |
| *edu* | -0.646\*\*\* | -0.618\*\*\* | -0.662\*\*\* | -0.118\* | -0.154\*\* | 1 |  |  |  |  |  |  |
| *govt* | 0.295\*\*\* | 0.294\*\*\* | 0.285\*\*\* | 0.041 | 0.313\*\*\* | -0.189\*\*\* | 1 |  |  |  |  |  |
| *pop* | 0.681\*\*\* | 0.656\*\*\* | 0.694\*\*\* | 0.230\*\*\* | 0.277\*\*\* | -0.631\*\*\* | 0.249\*\*\* | 1 |  |  |  |  |
| *lnfdi* | -0.449\*\*\* | -0.418\*\*\* | -0.457\*\*\* | -0.269\*\*\* | 0.031 | 0.556\*\*\* | -0.131\* | -0.576\*\*\* | 1 |  |  |  |
| *age* | 0.714\*\*\* | 0.678\*\*\* | 0.735\*\*\* | 0.019 | 0.165\*\* | -0.724\*\*\* | 0.196\*\*\* | 0.578\*\*\* | -0.600\*\*\* | 1 |  |  |
| *dem* | -0.123\* | -0.096 | -0.161\*\* | 0.167\*\* | -0.046 | 0.211\*\*\* | -0.083 | -0.202\*\*\* | 0.154\*\* | -0.227\*\*\* | 1 |  |
| *agr* | 0.900\*\*\* | 0.881\*\*\* | 0.895\*\*\* | 0.072 | 0.338\*\*\* | -0.682\*\*\* | 0.302\*\*\* | 0.753\*\*\* | -0.486\*\*\* | 0.734\*\*\* | -0.216\*\*\* | 1 |

Notes: \* p < 0.05, \*\* p < 0.01, \*\*\* p < 0.001. Source: Own estimates using data from sources listed in Table 1. Coverage: 1990-2021 period.

**Table 5: Regression analysis using the two-step system GMM approach**

|  |  |  |  |
| --- | --- | --- | --- |
|  | (1) | (2) | (3) |
| *Variables* | *Total vulnerable employment* | *Male vulnerable employment* | *Female vulnerable employment* |
| *Panel A: Estimation results* | | | |
| *lag vul\_tot* | 0.976\*\*\* |  |  |
|  | (0.025) |  |  |
| *lag vul\_male* |  | 0.959\*\*\* |  |
|  |  | (0.049) |  |
| *lag vul\_fem* |  |  | 0.986\*\*\* |
|  |  |  | (0.038) |
| *lag remit* | -0.035\*\*\* | -0.049\*\*\* | -0.038\*\* |
|  | (0.012) | (0.018) | (0.016) |
| *No of observations* | 371 | 371 | 360 |
| *No of countries* | 73 | 73 | 73 |
| *No of instruments* | 37 | 39 | 38 |
| *Panel B: Diagnostic test results* | | | |
| *Hansen p-value* | 0.381 | 0.222 | 0.548 |
| *AR (2) p-value* | 0.278 | 0.329 | 0.217 |

Notes: Standard errors in parentheses; \*\*\* p<0.01, \*\* p<0.05, \* p<0.1; The Hansen test is used to evaluate the joint validity of the instruments used. AR (2) is used to test second-order serial correlation in the error term. The dependent variable is personal remittances received as a percentage of the gross domestic product. Constant included but not reported. For brevity, the following control variables, though included in the analysis, are not reported here – age growth, education, age dependency ratio, government spending, population, natural logarithm of foreign direct investments, democracy and agriculture. The extended version of the table in the online Appendix (Table 6) provides full results, including the control variables.

Source: Own estimates using data from sources listed in Table 1. Coverage: 1990-2021 period.

**Figure 1: Vulnerable employment levels in developing countries from 1990-2021**

*Source: Own estimates using data from World Development Indicators. Average total vulnerable employment is measured as the percentage of people in such employment relative to total employment. Similarly, average male and female figures are measured in relation to male and female employment.*

**Figure 2: Vulnerable employment levels across regions in 2021**

*Source: Own estimates using data from World Development Indicators. Vulnerable employment is measured as the percentage of people in such employment relative to total employment. Similarly, male and female figures are measured in relation to male and female employment.*

**Figure 3: Vulnerable employment around the globe in 2021**

A map of the world

Description automatically generated

*Source: Own estimates using data from World Development Indicators. Vulnerable employment is measured as the percentage of people in such employment relative to total employment.*

**Figure 4: Remittances received by developing countries 1990-2021**

*Source: Own estimates using data from World Development Indicators. Remittances are measured as the percentage of gross domestic product.*

**Figure 5: Remittances received around the globe in 2021.**

**A map of the world

Description automatically generated**

*Source: Own estimates using data from World Development Indicators. Remittances are measured as the percentage of gross domestic product.*

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1. [] Vulnerable employment differs from self-employment and entrepreneurship. While self-employment includes the four subcategories of employers, own-account workers, producers' cooperative members, and contributing family workers, vulnerable employment consists primarily of contributing family workers and own-account workers, who are among the most vulnerable and, therefore, most likely to suffer from poverty. Vulnerable employment differs from entrepreneurship in that it is primarily undertaken as a means of survival and has a limited or no potential for income growth. For more information on this, please see World Bank (2022). [↑](#endnote-ref-2)
2. [] To see how the size of remittances changed overtime, please see figures 2 and 4. [↑](#endnote-ref-3)
3. [] Available in the online appendix (Table 7) [↑](#endnote-ref-4)
4. [] For a more detailed understanding of IV 2SLS, please read Yerrabati (2022) and Yerrabati (2023). [↑](#endnote-ref-5)
5. [] The region dummies are based on the classification provided by the World Bank (Table 2), while the income dummies are based on the classification provided by the United Nations (2020). [↑](#endnote-ref-6)
6. [] Alternate measures included: (1) personal remittances received in current US dollars as the percentage of gross domestic product measured in constant 2015 US dollars; (2) personal remittances received in current US dollars as the percentage of gross domestic product in purchasing power parity measured in constant 2017 international dollars; (3) personal remittances received in current US dollars as the percentage of real gross domestic product at constant 2017 national prices in million 2017 US dollars; (4) natural logarithm of personal remittances received in current US dollars; (5) personal remittances received as a percentage of the trend gross domestic product in constant 2015 US dollars. [↑](#endnote-ref-7)
7. [] The online Appendix’s table notes lists the countries with extreme levels of vulnerable employment that are excluded from the analysis. [↑](#endnote-ref-8)