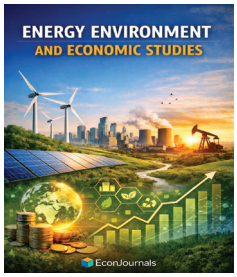

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Role of Informal Employment and Social Protection Access on Income Stability in the Context of Developing Economies – PLS-SEM Approach

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ABSTRACT

Developing economies continue to have a significant presence of informal employment (IE) and income instability (IS) is a major socioeconomic problem. The lack of access to formal employment and the limited coverage of social protection systems exacerbate income vulnerability. Therefore, this research seeks to investigate the influence of informal employment and social protection access (SPA) on income stability (IS) in developing countries. The study uses a deductive approach with a quantitative survey design. A sample of 99 people involved in informal employment and work activities was surveyed in particular developing countries. A questionnaire was constructed using a five-point Likert scale and Partial Least Squares Structural Equation Modeling (PLS-SEM) was used for the data analysis. We tested the direct effects of IE, SPA and IS. The study found IE has a negative impact on IS, whereas SPA has a positive impact on IS. And, IE negatively affects SPA, suggesting exclusion of informal workers from social protection systems. This study highlights that governments should broaden and extend inclusive social protection schemes for informal workers to improve income security. This will help reduce income instability and boost economic resilience in developing countries. The study adds to the existing research by bringing together Labor Market Segmentation Theory (LMS), Social Protection Theory (SPT), Vulnerability Theory and Resource-Based View (RBV). It offers empirical insights into the effects of IE and SPA on IS in developing countries.

Keywords: Informal Employment, Social Protection Access, Income Stability, Developing Economies, PLS-SEM
JEL Classifications: E2, E24

1. INTRODUCTION

IS continues to be a salient feature in developing countries where a large share of the workforce is engaged in IE with low wages, irregular incomes and weak contractual arrangements (Ali, 2025; Malombe, 2025). Across Sub-Saharan Africa and South Asia, the informal workforce accounts for over 60-80% of total employment, highlighting institutional and formalization gaps in the labor market (Wibowo and Kodrat, 2026; Haecal, 2024). These trends are compounded by economic shocks, inflation, and limited regulatory capacity, which heighten vulnerabilities and limit the potential for sustainable livelihoods (Andoh et al., 2024; Le et al., 2025). In this regard, SPA has emerged as a key policy tool to mitigate income volatility and improve economic outcomes for vulnerable groups (Syed et al., 2025). IE encompasses economic activities not covered by formal regulations and laws, and lacking social security, labour contracts, and basic rights (Buitrago et al., 2024). These types of work arrangements inherently tend to drive income volatility due to their reliance on seasonal work, market cyclicality and wage insecurity (Perło et al., 2025). On the other hand, SPA refers to public or private policies (such as cash transfers, health insurance, pensions and unemployment benefits) that aim to alleviate poverty and vulnerability along the life cycle (Yusof et al., 2024). IS, in this research, is defined as the stability

and predictability of income from employment, which is crucial for the welfare of households, consumption smoothing and long-term economic activities (Darwis et al., 2026). Selection of variables is theoretically and empirically motivated. IE is selected for its predominant role and structural impact on the labor markets in developing countries (Shahid et al., 2022). SPA is included as a moderating variable that has the potential to negate the negative impacts of informality through social protection and income assistance (Cequea et al., 2025). IS is included as the dependent variable, capturing the socioeconomic consequences of labor conditions and policies (Tulika and Ram, 2025).

These variables offer a holistic approach to understanding the interplay between structural labor conditions and institutional arrangements in influencing economic outcomes. From an industry viewpoint, agriculture, construction, retail and informal services are key employment sectors in developing countries, which heavily use informal labor forces (Fatima et al., 2026). For example, agriculture alone employs around 40% of the workforce in low-income economies, with the work often being seasonal and exposed to climate variability (Syed et al., 2025). Likewise, the construction and retail trade sectors are highly casualised and variable in terms of wages due to project-based activities and seasonality (Cong et al., 2024). The choice of these sectors for this research is based on the sectors' role in providing employment, vulnerability to livelihood risks, and lack of integration with formal social protection. Current market trends show increasing inflation and uncertainty, which adversely impact informal workers, as income levels reduce and livelihoods are threatened (Tackie et al., 2022). While there is an increasing interest in informality and social protection, some important gaps remain. Existing research has mostly explored IE and income separately, without considering the moderating or buffering impacts of SPA (Zeini et al., 2023; Gubwe et al., 2025). Many studies examine poverty reduction, rather than IS as a separate and dynamic construct (Syed et al., 2025). Evidence is scant on empirical studies that apply sophisticated methods like PLS-SEM to depict intricate interrelationships of the constructs (Buitrago et al., 2024; Le et al., 2025).

The majority of research focuses on macro-level approaches without considering micro-level differences between sectors and workers (Cong et al., 2024; Santoso et al., 2026). The impact of social protection to reduce income volatility in informal employment is less examined in developing economies (Ali, 2025; Ngo and Nguyen, 2025). Moreover, aspects like accessibility, adequacy and inclusivity of social protection schemes are not adequately tackled (Megawati et al., 2026; Buitrago et al., 2024). These shortcomings call for a more comprehensive and sophisticated analysis. Thus, this study aims to: (1) Investigate the effect of IE on IS (2) To assess the impact of SPA on IS; and (3) To evaluate the joint effect of IE and SPA in a structural equation modeling framework using PLS-SEM. Achieving these goals will help to deepen our understanding of the labor market and policy in developing countries. This research makes a number of contributions. Theoretically, it synthesises the labor market segmentation and social protection approaches to understand IS in the informal sector. It also employs PLS-SEM to model multidimensional and complex dynamics to enhance empirical research in this area. In practice, the study offers policymakers practical guidance for designing and implementing social protection policies and programs that cater for informal workers, and improve economic resilience. The research is novel in considering the interplay between structural working conditions and institutional arrangements to tackle an important, yet under-researched topic. Overall, this study is driven by the pressing need to comprehend and tackle IE in developing countries, where IE prevails and social protection strategies are disjointed. The study spans theory, empirical evidence and policy to contribute to knowledge development and sustainable development policy.

2. THEORETICAL BACKGROUND

Drawing on a multi-theoretical framework that combines LMS, SPT, Vulnerability Theory, and the RBV, this study aims to understand the impact of IE and SPA on IS in developing economies. The adoption of multiple theories is intentional as income instability among informal workers is multifaceted, multidimensional and shaped by both labor market and institutional factors (Ali, 2025; Lawal et al., 2025). LMS Theory explains that the market is segmented into formal and informal sectors with the latter exhibiting low wages, low mobility and no social protection. This theory is applicable in developing countries, where workers are unable to move into the formal sector due to structural constraints (Haroun and Yusoff, 2025). Consequently, IE, by its nature, increases income instability because of uncertain incomes, absence of contractual agreements and market risks (Yusof et al., 2024). Existing empirical evidence has shown that workers in the informal sector tend to have more volatile incomes than those in the formal sector (Andoh et al., 2024; Nguyen and Vu, 2025). This theoretical approach supports the integration of IE as a predictor of IS. Additionally, the SPT offers insights into the role of institutional mechanisms in reducing economic vulnerability and increasing livelihood security (Barrientos, 2013).

Social protection refers to the policies, such as cash transfers, pensions and health insurance, that are designed to address poverty and income inequality among various segments of society (Darwis et al., 2026). In IE, access to such mechanisms can be constrained, but plays a crucial role in offsetting income shocks (Perło et al., 2025). Evidence supports the notion that social protection programs enhance income stability by helping to smooth consumption and buffer against shocks (Wibowo and Kodrat, 2026; Eriqat et al., 2025). Inclusion of SPA in this study is therefore justified as a buffering element that can mitigate the negative impacts of informality. The Vulnerability Theory also enhances the theoretical underpinning by focusing on the vulnerability of individuals to risks and their resilience to shocks (Chambers, 1989). The informal workforce is especially vulnerable because of their dependence on insecure income streams and the absence of institutional mechanisms (Tackie et al., 2022). This theory highlights the dynamic nature of IE, by emphasising how external shocks (e.g. recession, inflation, health) also impact informal workers (Gubwe et al., 2025). Past research has demonstrated that vulnerability is minimized where individuals are able to access social protection measures, which provide a buffer against

income shocks (Cong et al., 2024; Zeini et al., 2023). Therefore, Vulnerability Theory offers a key connection between IE, SPA and IS. Similarly, the RBV provides a micro-level view of SPA through a resource-based approach (Barney, 1991). In this context, SPA can be seen as a valuable, rare, and inimitable resource that helps individuals manage risks and ensure IS (Haecal, 2024). This view is supported by empirical evidence that households with access to institutional resources, such as social protections, are capable of coping with economic shocks and maintaining income streams (Syed et al., 2025). This view supports the inclusion of social protection as both a policy and resource variable that affects the economy.

Combining these theories provides a unified view of the relationship between the structural underpinnings of work and institutional responses. Previous research has focused on aspects of informality, social protection and income (Bazán Valque et al., 2025; Malombe, 2025) but has tended to overlook the integration of these approaches. Recent empirical studies have also started to emphasise this need by showing that the adverse impact of IE on IS can be reduced through effective social protection policies (Yusof et al., 2024). Additionally, the use of more sophisticated modelling techniques like PLS-SEM has been suggested to effectively model the complex inter-relationships between these variables (Muhihi and Lusambo, 2022). In conclusion, the theoretical approaches chosen are highly relevant to the study's research questions and offer a comprehensive lens to explore the antecedents of IS in developing countries. LMS accounts for the structural inequality of IE, SPT emphasizes the importance of institutional support, Vulnerability Theory captures the risk implications and RBV explains the resource-based aspects of resilience. These theories combine to form a holistic and coherent model, supported by previous empirical evidence, and address gaps in the research.

2.1. Informal Employment and Income Stability

IE is acknowledged as one of the structural factors that hinder IS, especially in developing countries where the labor market is highly segmented and the regulatory system is weaker (Ali, 2025). IE workers tend to have intermittent earnings, lack formal contracts, and have limited access to labour protection, which leads to volatile income streams (Megawati et al., 2026). Yusof et al. (2024) report that over 60% of the workforce in developing countries is engaged in the informal sector, suggesting the magnitude of vulnerability to income shocks associated with this type of work. Evidence indicated that informal workers are more vulnerable to income shocks given their reliance on seasonal employment and informal working arrangements (Gubwe et al., 2025). Moreover, research has demonstrated that IS is not only caused by low incomes but also by high income variability, which is a feature of IE (Zeini et al., 2023; Muhihi and Lusambo, 2022). From a vulnerability standpoint, informal workers have no institutional safety nets, such as social security or unemployment benefits, and are vulnerable to economic shocks (Eriqat et al., 2025). This volatility is even more acute in developing countries where agriculture, construction and retail trade are the major informal sectors, given the macroeconomic and inflationary shocks (Tackie et al., 2022). Thus, theoretically and empirically, it is well justified that IE has a negative effect on IS, making the need for structural and policy reforms to tackle informality in the labour market imperative.

H_1: IE has a negative effect on IS in developing economies.

2.2. Social Protection Access and Income Stability

SPA is important for improving IS, especially in developing countries where many workers are involved in informal employment and vulnerable to employment conditions (Buitrago et al., 2024). Social protection programs, including cash transfers, unemployment benefits, health insurance and pensions, are institutional frameworks that help smooth income streams and cushion the impacts of shocks on the vulnerable population (Santoso et al., 2026). Research indicates that households receiving social protection transfers exhibit lower consumption volatility and higher resilience than those without access to social protection (Wibowo and Kodrat, 2026). In emerging markets, where IE prevails in the labour market, income volatility can arise from unstable earnings and lack of access to formal financial protection (Bazán Valque et al., 2025). Social protection measures address these issues by offering reliable income support against shocks such as unemployment, illness, or economic crises (Santoso et al., 2026). Research also shows that adequate social protection reduces vulnerability and increases economic stability, especially for the poor and informal workers (Cequea et al., 2025; Ngo and Nguyen, 2025). Theoretically, vulnerability theory states that income instability occurs when people lack the capacity to adapt to risks (Shahid et al., 2022). Therefore, social protection stabilises income by decreasing vulnerability and increasing resilience (Fatima et al., 2026). Moreover, findings from the field of labor welfare show that comprehensive social protection systems are effective in promoting long-term income security and alleviating poverty (Dash and Sahoo, 2025; Tulika and Ram, 2025). Therefore, given the strong theoretical and empirical evidence, it is valid that SPA has a positive impact on IS in developing economies through income smoothing and building economic resilience.

H_2: SPA has a positive effect on IS in developing economies.

2.3. Informal Employment and Social Protection Access

IE is linked to inadequate or unequal SPA systems, especially in developing economies with fragmented institutional coverage and weak enforcement (Ali, 2025). IE workers generally do not operate under formal regulations and thus are not covered by contributory social security programs, such as pensions, unemployment benefits and health insurance (Lawal et al., 2025). This makes informally employed people less likely to appear in national databases that determine their eligibility for state-driven social protection programs (Syed et al., 2025). Research also indicates that informal workers are excluded from social protection due to the absence of formal contracts, inconsistent income streams, and administrative exclusion (Cequea et al., 2025; Wibowo and Kodrat, 2026). In many developing countries, more than 70% of informal workers are excluded from formal social insurance, signalling institutional deficiencies (Eriqat et al., 2025). This gap is compounded by high administrative costs, low awareness and stringent eligibility criteria that heavily burden informal workers (Haroun and Yusoff, 2025). Theoretically, LMS theory explains this gap by emphasising the separation between informal labour

markets and formal institutional arrangements, such as social protection (Shahid et al., 2022). Furthermore, vulnerability theory highlights the exclusion from social protection as a factor of vulnerability to economic shocks and to limit informal workers' ability to adapt (Darwis et al., 2026). Research also confirms that formal employment plays a critical role in social protection coverage, which underpins the negative relationship between informality and social protection (Zeini et al., 2023; Fatima et al., 2026). Hence, given solid theoretical and empirical evidence, it is well justified that IE has a negative impact on SPA in developing countries by contributing to structural exclusion and restricting institutional inclusion. The conceptual model used in the study is presented in Figure 1.

H_3: IE has a negative relationship with SPA in developing economies.

3. METHODOLOGY

This research utilised a quantitative questionnaire survey based on a deductive research approach. This involved a literature review and a self-administrated survey. From the developed hypothesis, a questionnaire was developed based on the identified variables for a survey to examine the impact of IE Yusof et al. (2024); Gubwe et al. (2025) and SPA Ali (2025); Malombe (2025) on IS Zeini et al. (2023); Bazán Valque et al. (2025) in developing economies. The questionnaire that was developed was tested on (5) labor market and social policy experts to confirm the variable identified from the literature review. These experts were selected based on their knowledge of the Labor market and social protection policies with the criteria being professional qualifications, at least 15 years of experience in the field and experience in public policy development and labor market analysis particularly in the context of developing economies. Moreover, these professionals were allowed to alter or add variables if required. A pre-configured closed-ended questionnaire was constructed, using a Likert scale of (1) Strongly disagree to (5) Strongly Agree. These surveys were designed to be self-administered and online for informal workers and social policy stakeholders engaged in labor and welfare programs in developing countries.

The population of this study included informal workers, beneficiaries of social protection programs, and government agencies involved in labor welfare programs registered with the labor department and social protection offices in developing countries. Through a simple random sampling method using the rule of thumb for the sample size of the PLS-SEM, Hair et al. (2014) has suggested that the best sample size for a structural model in SEM should be ten times the largest number of formative indicators to measure a construct or ten times the number of structural paths leading to a specific construct. However, Hair et al. (2014) recommended the sample size should be ideally 5-10 times the number of indicators or variable items. As a result, the sample size for this study was determined to be 150. The data collection period was one month to ensure that the participants had enough time for their responses to be used for data analysis. After repeated phone calls and emails, 99 questionnaires were returned out of the 150 questionnaires, giving a response rate of 66%. This data was then checked for validity and reliability. There were no missing data from these professionals and the data set used in the study was complete. Cong et al. (2024) notes that SEM is a well-known statistical model testing method. SEM has several advantages: It can test multiple relationships simultaneously, test the fit of a model to a set of data and test alternative models (Lawal et al., 2025).

Moreover, SEM allows the amalgamation of two forms of model testing: multiple regression analysis and factor analysis. While multiple regression analysis explores the relationship between a criterion variable and a number of predictor variables, factor analysis reveals latent variables (i.e. factors) that account for the variance among a group of observed variables. The latter technique is often applied to uncover the latent factor structure of responses to questionnaire items (Hair et al., 2014). SEM approaches fall into two broad categories: variance-based (partial least squares, PLS) and covariance-based (Buitrago et al., 2024). As such, SEM-PLS is an appropriate method for this study. The present study has carefully scrutinised both the measurement model (validity and reliability) and the structural model (relationship between variables). This was performed using Smart PLS Version 4.0.9.2.

4. FINDINGS

4.1. Demographics of the Study

Respondents' demographics play a crucial role in improving problem-solving and tackling specific development challenges in the labor markets and social protection systems (Yusof et al., 2024). The demography of the respondents is extracted from the informal sector, the labor market and social protection beneficiaries in developing economies of South Asia. In the respondents' background, their work experience and academic backgrounds were included. Shahid et al. (2022) agreed that performance is impacted by work experience and education. Eriqat et al. (2025) concurred that education boosts professional and organisational knowledge building. These factors influence individuals' skills, knowledge and talents, which affect their economic activities and income stability. Employees with more than 10 years of work experience could have vast knowledge and experience on income trend, work conditions and access to social protection schemes. These informants had a good understanding of the nature of informal employment, income variability and access to welfare, which suggests a high level of understanding of the vulnerability of labour obtained through these many years of experience (Malombe, 2025). The Table 1 presents descriptive statistics of respondents' characteristics. In terms of experience in the informal sector, 18.3% had 1-5 years of working experience in the informal sectors, 41.2% had 6-10 years of work experience and 40.5% had more than 10 years of working experience. In terms of the educational qualification of the respondents, 2.1% had a diploma certificate; 49.7% had a bachelor's degree and 48.2% had a master's degree. In terms of geographical coverage, the data were collected from a few selected developing South Asian economies to represent different types of labour markets and social protection arrangements. Table 2 shows the country-level distribution of the respondents. Pakistan constituted 28% of the responses, capturing high informal employment-intensive urban and semi-urban labor markets. India accounted for 34% of the sample, reflecting a

Table 1: Demographic characteristics of respondents

Variable	Category	Frequency	Percentage
Work experience	1-5 years	19	19.0
	6-10 years	41	41.0
	Above 10 years	40	40.0
Total		100	100
Education level	Diploma	2	2.0
	Bachelor's Degree	50	50.0
	Master's Degree	48	48.0
Total		100	100

Table 2: Country-wise distribution of respondents

Country	Frequency	Percentage
Pakistan	28	28.0
India	34	34.0
Bangladesh	18	18.0
Nepal	10	10.0
Sri Lanka	10	10.0
Total	100	100

high informal employment sector in agriculture, construction and retail. Bangladesh contributed 18% of the responses, where the majority of workers are engaged in informal manufacturing and the garment industry. Nepal represented 10% of the sample, with rural and seasonal labour workers. Sri Lanka contributed 10% of the responses, which represents a combination of informal and semi-formal employment in the service and tourism sectors. This spread of responses across the countries represents a mix of developing economies where informal employment and social protection access experiences are very different, thus enhancing the validity and reliability of the study results.

4.2. Model Assessment

Our survey data were analysed statistically using PLS-SEM. The PLS-SEM analysis followed the recommended guidelines established by Hair et al. (2014) which include the evaluation of the reflective measurement model and the evaluation of the structural model. The assessment of the reflective measurement model included internal reliability, validity and average variance extracted (AVE). This analysis included assessment of the coefficient of determination (R2), cross-validated redundancy (Q2) and path coefficients (Hair et al., 2014). The following section discusses the relationship test.

4.3. Reflective Measurement Model Assessment

To assess the measurement model of the proposed model, reliability, convergent validity and discriminant validity were measured according to the procedure suggested by Hair et al. (2014). We tested the internal consistency of the constructs using Cronbach's alpha, composite reliability and AVE. Hair et al. (2014) recommend factor loadings >0.70 (Table 3). Having applied the outer loading test criterion and removed one indicator with a loading less than 0.441, reliability was assessed. Cronbach's alpha measures the reliability of a construct through inter-item correlations, and should be 0.700-0.980 (Muhihi and Lusambo, 2022). Our findings of 0.947-0.955 confirmed reliability. We also calculated composite reliability and AVE to support the assessment of internal consistency. Higher composite reliability values (closer to one) demonstrate greater reliability, with Hair et al. (2014) advising this be >0.700. As for the AVE, Hair et al. (2014) suggested values of 0.500 or higher indicate satisfactory internal consistency. The AVE ranged from 0.619 to 0.709 and composite reliability ranged from 0.959-0.968, which indicated these measures of internal consistency and reliability were acceptable.

Table 3: Factor loading, cronbach's alpha, composite reliability and AVE

Variables	Loadings	Cronbach's alpha	Composite reliability	AVE
IE	0.955	0.961	0.619	
IE1	0.818			
IE10	0.781			
IE11	0.764			
IE12	0.441			
IE13	0.889			
IE14	0.887			
IE15	0.833			
IE2	0.774			
IE3	0.821			
IE4	0.748			
IE5	0.869			
IE6	0.732			
IE7	0.776			
IE8	0.733			
IE9	0.829			
SPA	0.954	0.968	0.709	
SPA1	0.869			
SPA10	0.864			
SPA2	0.812			
SPA3	0.762			
SPA4	0.916			
SPA5	0.908			
SPA6	0.882			
SPA7	0.941			
SPA8	0.717			
SPA9	0.707			
IS	0.947	0.953	0.707	
IS1	0.768			
IS2	0.876			
IS3	0.782			
IS4	0.906			
IS5	0.850			
IS6	0.823			
IS7	0.836			
IS8	0.934			
IS9	0.773			

Source(s): Authors' own work

4.4. Mediation Analysis

This analysis was aimed at investigating the causal relationship between an independent variable and dependent variable, with a third explanations mediator variable added to the study (Fatima et al., 2026). This was done using the PLS-SEM bootstrapping procedure. Bootstrapping was chosen because it does not have a requirement of large sample sizes and does not assume the sampling distribution of the statistics (Hair et al., 2014). A mediation analysis was conducted to test the mediating effect of SPA on IE and IS. The findings in Table 4 show there is a significant indirect effect of IE on income stability (beta = −0.172; t = 2.236; P < 0.026). The total effect of IE on IS was significant (beta = 0.818; t = 11.998; P < 0.00), with the inclusion of a mediator, the effect of IE on IS was still significant (beta = 0.986; t = 10.732; P < 0.00). This exhibits

Table 4: Mediation analysis

Mediation analysis	Type of effect	Effect	Beta value	Sample mean	t-value	P-value	Remarks
Total effect	IE–IS	0.818	0.812	11.998	0.000	Sig total effect	
Indirect effect	IE–SPA–IS	−0.172	0.168	2.236	0.026	Sig indirect effect	
Direct effect	IE–IS	0.986	0.981	10.732	0.000	Sig direct effect	
VAF	IE/TE	21.034					Partial mediation exists between informal employment and income stability

Source(s): Authors' own work

the contemporary partial mediator role of SPA in the relationship between IE and IS. The Heterotrait-Monotrait (HTMT) ratio proposed by Henseler et al. (2015), was used to assess discriminant validity in the PLS-SEM model. The conventional methods to test for discriminant validity are not very sensitive. So a new criterion based on the Multitrait-Multimethod (MTMM) matrix was applied. The Hetero-trait Mono-trait (HTMT) ratio analysis provided an insight into the level of discriminant validity and aided the determination of construct validity in variance-based SEM models (Henseler et al., 2015). Henseler et al. (2015) suggest that values below 0.90 are acceptable levels of discriminant validity. As evidenced in the results in Table 5, all of the HTMT ratios are smaller than 0.900, suggesting that the study model has adequate discriminant validity.

Table 5: Heterotrait–Monotrait ratio (HTMT) – Matrix

Latent construct	Informal employment	Social protection access	Income stability
IE	*		
SPA	0.718	*	
IS	0.862	0.457	*

Source(s): Authors' own work

Table 6: Predictive accuracy of the model

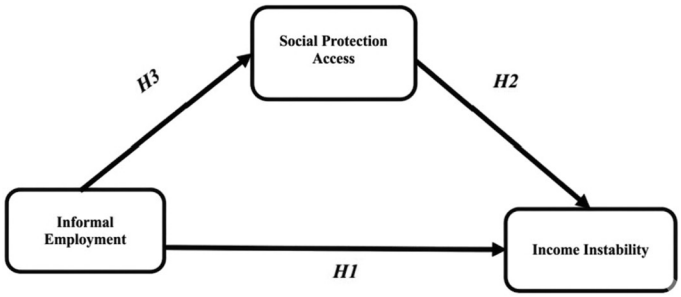
Dependent variables	R-square	R-square adjusted	Effect
SPA	0.512	0.615	Moderate
IS	0.718	0.835	Moderate

Source(s): Authors' own work

4.5. Structural Model Assessment

Evaluation of the estimation of the structural model is important to determine the amount of empirical support for the hypothesis. As recommended by Hair et al. (2014), the coefficient of determination (R^2) and the path coefficient are a good way of evaluating the conceptual relationship of the structural model. Hair et al. (2014) suggested that R^2 values of 0.75, 0.50 and 0.25 are marked as substantial, moderate or weak predictive accuracy, respectively. As shown in Table 6, the R-square for SPA and IS are 0.512 and 0.718 respectively, which means the independent variables in the regression model were able to explain 51.2% of the variance of SPA and 71.8% of variance of IS. The adjusted R-square for the dependent variables are 0.615 and 0.835, implying that the relationship may moderately predict the dependent variable of SPA and IS. To test the hypothesis, assessments were made of the path coefficients and P-values. These are calculated with the help of Smart-PLS software, based on the bootstrapping method. The bootstrapping method took into account a sample size of 5,000, a 5% confidence level ($\alpha = 0.05$; two-tailed) (Figure 2). This means that $t > 1.96$ are significant (or that the hypothesis is supported). Table 7 shows the overview of path coefficients and their corresponding significance levels.

Figure 1: Conceptual model



5. DISCUSSION

We tested the associations between IE, SPA, and IS in developing countries using PLS-SEM. The results confirm the proposed relationships and provide theoretical and contextual evidence of the vulnerability and welfare mechanism in the labour market of South Asian economies. First, the findings establish that IE negatively affects IS. This result is in line with previous research that claims IE is structurally linked with volatile incomes because of the lack of formal employment contracts, wage insurance and employment stability (Zeini et al., 2023; Ngo and Nguyen, 2025). While empirical findings of Tackie et al. (2022) also confirm that informal workers face irregular income and vulnerability to economic shocks. This finding was also confirmed by Andoh et al. (2024) and Lawal et al. (2025), who confirm that informality raises income variability in Latin American and Asian countries. Also, Shahid et al. (2022) highlighted that income variability is a typical characteristic of informal labour markets due to absence of institutions.

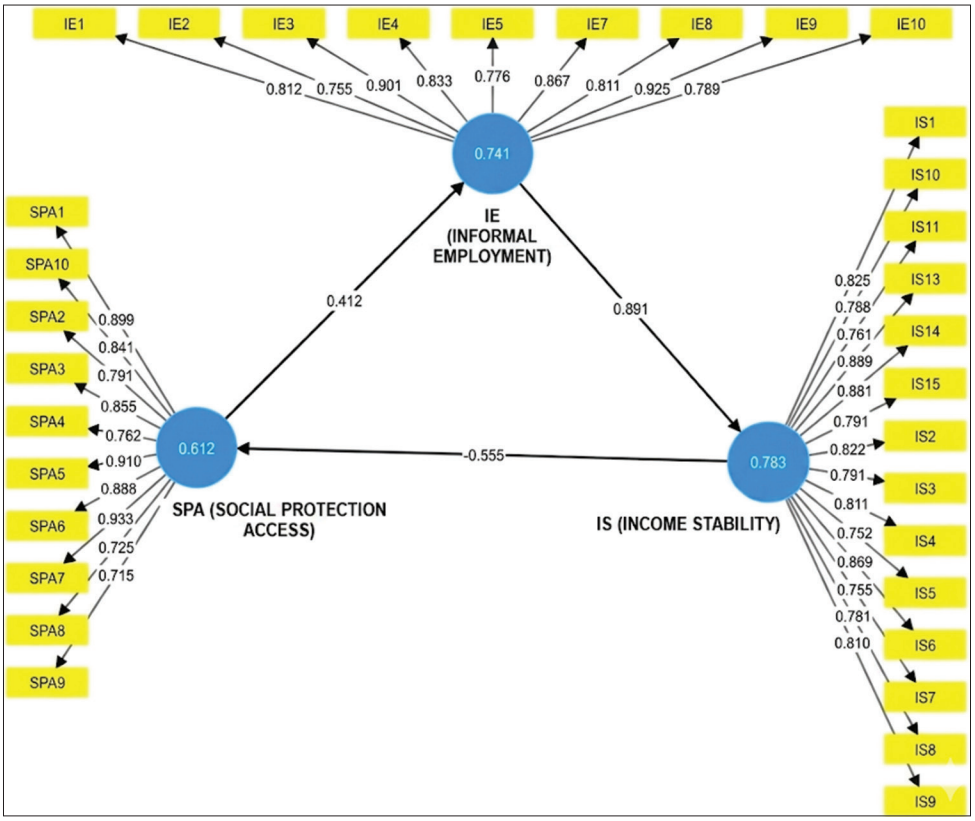
However, some studies like Malombe (2025) provide a more ambivalent perspective, implying that informality sometimes reflects a matter of choice; but even in such instances, income instability still occurs. Thus, our results are strongly in line with the mainstream literature and support vulnerability view. Second, our study identifies a significant positive impact of SPA on IS. This finding is well supported by Darwis et al. (2026) who stressed that social protection systems have an income-stabilisation effect on vulnerable groups. Likewise, Megawati et al. (2026) highlight that social protection alleviates economic insecurity by offering protection against income shocks. Evidence from empirical research by Zeini et al. (2023) and Dash and Sahoo (2025) also shows that cash transfers and social protection programs enhance income smoothing. In developing countries, Tulika and Ram (2025) findings demonstrate that social protection schemes lower

Table 7: Path coefficient

Path relationship	t-statistics	Critical value	Statistically significant	P-values	Critical value	Statistically sig.
IE→SPA	10.118	1.960	Yes	0.000	0.050	Yes
IE→IS	10.752	1.960	Yes	0.000	0.050	Yes
SPA→IS	2.104	1.960	Yes	0.034	0.050	Yes

Source(s): Authors' own work

Figure 2: PLS-SEM results



poverty and income shocks among informal sector workers. Moreover, Cong et al. (2024) reported that social protection programs increase resilience in the face of shocks. But other research such as Shahid et al. (2022) points to implementation and coverage issues, which reduce the effectiveness of the programs in some countries. While these factors limit the effectiveness of the impact, the present evidence provides robust evidence of the positive effects of social protection.

Third, the research shows that IE has a negative influence on SPA. This is consistent with the LMS which explains the structural exclusion between formal and informal sectors (Le et al., 2025; Syed et al., 2025). Dash and Sahoo (2025) report that informal workers are often excluded from contributory welfare systems due to lack of registration and legal recognition. This finding is supported by Yusof et al. (2024), who identify institutional barriers that restrict access to social welfare. Likewise, Santoso et al. (2026) confirm that informality decreases access to insurance-based protection systems. However, some recent studies also indicate that non-contributory programs can provide limited coverage to informal workers Haroun and Yusoff (2025), but the coverage is not uniform across developing countries. So, this study strengthens the idea that informality is significantly linked to low SPA. This study adds to the existing understanding by showing that social protection has a mediating effect on the negative impacts of IE on IS. This finding aligns with vulnerability theory that institutional support mitigates economic risks (Ali, 2025). Malombe (2025) also highlight that social protection reduces risks in the labor market and income insecurity. Other empirical research by Fatima et al. (2026) and Perło et al. (2025) also supports the mediation effect of welfare systems on household income. However, few studies like Zeini et al. (2023) do not explicitly explore mediation, showing a gap in the literature that this study fills. Therefore, the mediation result reinforces the view that institutional arrangements play an important role in reducing vulnerability to informality.

In all, the results of this study are in line with the previous research, while enhancing it by including mediation analysis in a developing country setting. The findings, overall, support the notion that IE enhances income volatility, and SPA has a substantial moderating effect. This combined model offers a deeper insight into how LMS and IS affect income outcomes in vulnerable economies.

5.1. Theoretical Contributions

This research makes solid theoretical contributions by synthesising LMS, SPT, Vulnerability Theory and RBV into a coherent

framework to explain income stability in vulnerable economies. First, LMS is advanced by testing empirically the role of IE in limiting IS via access to formal labour protections. Second, SPT is enhanced by showing that it is not just a mechanism for poverty reduction but also an institutional stabilisation tool that directly supports income stability for vulnerable workers. Third, Vulnerability Theory is advanced by demonstrating how vulnerability to labor market shocks transforms into IS in the absence of institutional support. Fourth, RBV is extended to the individual level by showing how SPA, as a resource, enhances resilience and income stability. This study also contributes by empirically confirming a mediating process, in which SPA mitigates the effect of IE on IS, which has been overlooked in previous research. This combined approach links structural labor factors with institutional and resource-based theories, providing a more comprehensive view of income in developing countries.

5.2. Practical Implications

The findings of this research have significant policy implications for governments, labor unions and development agencies in establishing an inclusive welfare system in developing countries. This research shows IE is a key driver of income instability, pointing to the need for policies on formalizing employment and strengthening regulatory frameworks. Policymakers should focus on extending social protection to informal economic workers through non-contributory programs like cash transfers, health insurance and income security. The indirect impact of SPA suggests the welfare system can dampen income shocks even when formal work is not readily available. This suggests the need for flexible and inclusive policy settings targeting vulnerable workers. Policies should also focus on digital systems and information campaigns to minimize exclusion errors in welfare payments. These findings can also inform development agencies to develop strategies for agriculture, construction and informal retail, where income volatility is the highest. In sum, the results offer empirical insights that investing in SPA systems is not only a welfare program but also an economic stability program for informal workers.

6. CONCLUSION, LIMITATIONS AND FUTURE RESEARCH DIRECTIONS

This research finds that IE negatively impacts IS in developing countries, but SPA has a stabilizing effect. The results support the existence of structural vulnerability caused by labor market segmentation, but show that institutional factors like SPA can cushion its negative impact. The moderating impact of SPA shows that IS is not only influenced by job types but also by institutional support. By combining Labor Market Segmentation Theory, Social Protection Theory, Vulnerability Theory and RBV, this study offers a holistic view of income dynamics in the informal economy. Our findings highlight the need for a two-fold strategy to enhance IS: decreasing informality through structural changes and enhancing inclusive SPA. In sum, this study adds to the theory and practice by drawing attention to the importance of institutional support for economic resilience in developing countries.

This study has some limitations. First, cross-sectional data limit the capacity to draw inferences about long-term causal relationships between IE, SPA and IS. Second, the study has been conducted in a number of developing countries in South Asia, which may limit the applicability of the results to other parts of the world, like Africa and Latin America. Third, the use of self-reported data from surveys might be affected by response bias, especially for sensitive items like income and welfare. Longitudinal studies should be considered to understand dynamic changes in IS. Cross-regional comparisons may improve the transferability of the findings. Future research could also include other mediator or moderator variables such as financial inclusion, digital access to social services or the strength of labor market regulation. Innovative qualitative or mixed methods may provide greater insights into informal workers' experiences. Incorporating macroeconomic shocks (such as inflation or climate risk) could also enhance the model.

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