
Informality and Labor-Market Vulnerability in Developing Economies: Institutional Regulation, Employment Dynamics, and Pathways toward Sustainable Formalization

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Abstract

This paper examines the relationships among informality, employment vulnerability, and labor-market regulation in developing economies. It considers informality as a heterogeneous and persistent component of labor-market organization rather than as a temporary residual sector. The analysis emphasizes the roles of worker characteristics, firm productivity, institutional conditions, regulatory costs, enforcement capacity, and structural transformation in shaping transitions between formal and informal activities. Particular attention is also given to the vulnerability associated with informal employment, including income instability, limited social protection, unequal access to opportunities, and greater exposure to economic and health shocks. The paper further assesses how minimum wages, labor inspections, employment protection, payroll costs, financial inclusion, and digitalization influence formalization outcomes. The reviewed evidence indicates that isolated regulatory measures generally produce heterogeneous effects because their effectiveness depends on institutional capacity, firm characteristics, labor-market conditions, and the incentives attached to formal status. The paper therefore argues for an integrated approach combining proportionate regulation, credible enforcement, productive development, broader social protection, financial inclusion, and appropriate digital mechanisms. Such coordination appears necessary for reducing persistent informality while improving employment quality and limiting labor-market vulnerability in developing economies.

Keywords: Informality; Employment vulnerability; Labor-market regulation; Formalization; Social protection; Developing economies

JEL classification: J46; J48; J58; O17

Introduction

Informality remains a defining feature of labor markets in many developing economies, where a substantial proportion of workers and firms operate outside standard regulatory, fiscal, and social-protection arrangements. It should not be viewed as a homogeneous residual sector, since informal activities differ considerably in terms of productivity, earnings, employment stability, mobility, and exposure to regulation. Its persistence reflects interactions among worker characteristics, firm productivity, regulatory costs, institutional capacity, and the availability of

productive formal employment. Transitions between formal and informal activities are therefore uneven, while education, professional experience, business size, market access, and expected returns to formal status influence the capacity of workers and enterprises to move toward more regulated forms of economic activity. At the same time, informality is closely associated with employment vulnerability. Workers may remain economically active while facing unstable incomes, weak contractual protection, limited social insurance, and greater exposure to health and economic shocks. These disadvantages are often more pronounced among women, young workers, rural populations, and individuals with limited access to education, finance, networks, and productive resources. Informality consequently represents both a labor-market structure and a source of differentiated socioeconomic vulnerability.

Against this background, this paper examines the relationships among informality, employment vulnerability, and labor-market regulation in developing economies. Particular attention is devoted to the effects of minimum wages, employment protection, labor inspections, payroll costs, institutional conditions, financial inclusion, and digitalization on the allocation of workers and firms between formal and informal activities. Regulatory interventions can improve labor standards and encourage compliance, but their effects depend strongly on enforcement capacity, firm productivity, labor costs, and the broader economic environment. Poorly calibrated or weakly implemented regulations may reinforce avoidance and employment reallocation, whereas proportionate standards supported by credible institutions can facilitate formalization and improve worker protection. Formalization, however, cannot be achieved through regulation alone. Productive transformation, broader social protection, lower barriers to formal employment, stronger institutional trust, access to financial services, and appropriate digital technologies also influence the incentives faced by workers and enterprises. The paper therefore adopts an integrated perspective in which informality is treated as the outcome of interdependent regulatory, productive, institutional, social, financial, and technological mechanisms. This approach provides a basis for understanding why isolated measures often produce limited results and why durable formalization requires coordinated labor-market and development policies.

1. Structure and Persistence of Informality in Developing Economies

1.1. Labor-market segmentation, mobility, wages, and transitions

Danquah et al. (2021) show that informal employment cannot be treated uniformly as either a dead end or a stepping-stone, since mobility prospects differ substantially according to the type of informal activity and workers' characteristics. Their findings imply that informality must be examined through trajectories rather than current employment status alone. Gutierrez et al. (2019) reinforce this perspective by documenting both considerable mobility and substantial persistence between formal and informal employment in Bangladesh, with education, job attributes and previous employment histories shaping transitions. Sugiharti et al. (2022) similarly show in Indonesia that education increases the probability of obtaining formal employment while demographic and employment characteristics affect persistence in informality. Meghir et al. (2015) provide the broader equilibrium foundation by demonstrating that formal and informal employment coexist because of worker heterogeneity, firm productivity and regulatory costs rather than because informality simply absorbs the unemployed. Formal-informal segmentation is therefore dynamic but not necessarily temporary. Workers differ in their capacity to move toward formal employment, and these differences can produce persistent inequalities when education, prior employment conditions and access to productive firms systematically influence transition probabilities.

Bobba et al. (2021) show that informal employment affects workers' future prospects through differences in on-the-job human-capital accumulation, meaning that segmentation influences more than current wages or access to benefits. Their findings imply that repeated or prolonged informal employment can generate cumulative disadvantages if workers acquire less productive experience or encounter weaker opportunities for subsequent mobility. Haanwinckel and Soares (2021) provide an important qualification by showing that observed formal–informal differences also reflect worker and firm sorting according to productivity, preferences and regulatory incentives. Bobba et al. (2022) move the relationship further upstream by demonstrating that expected formal and informal employment opportunities can influence schooling choices before workers even enter the labor market. Gutierrez et al. (2019) add that employment history itself conditions later sectoral transitions. Informality can therefore become self-reinforcing through several mechanisms operating over time. Current employment affects experience accumulation and future mobility, while anticipated sectoral opportunities shape earlier investments in education. Policies addressing segmentation consequently need to consider these dynamic responses rather than focusing only on immediate movements between formal and informal jobs.

Haanwinckel and Soares (2021) show that regulatory costs and benefits influence employment choices while interacting with worker productivity and firm characteristics, indicating that informality cannot be attributed mechanically to regulation alone. Meghir et al. (2015) similarly demonstrate that wage and employment differences between formal and informal sectors reflect both institutional conditions and selection. Bobba et al. (2022) add that these institutional structures can affect human-capital investment by changing the expected returns to schooling across future employment sectors. Sugiharti et al. (2022) provide supporting evidence that education improves workers' chances of entering formal employment, while other characteristics influence persistence in informality. The formal–informal divide therefore emerges from an interaction between regulation, productivity, education and worker sorting. Lowering regulatory costs may facilitate formalization, but durable reductions in segmentation also depend on improving workers' productive capabilities and the availability of formal opportunities that generate sufficiently attractive returns. A dynamic perspective is consequently necessary because institutional conditions affect decisions made both before and after labor-market entry.

1.2. Informal firms, productivity, trade, and structural transformation

McCaig and Pavcnik (2018) show that improved access to export markets can reduce informality indirectly by expanding labor demand in formal manufacturing establishments. Their findings imply that formalization can emerge through structural transformation rather than through administrative reform alone. Ulyssea (2018) provides a complementary firm-level explanation by showing that businesses differ substantially in productivity, regulatory exposure and the margins through which they remain informal. Rothenberg et al. (2016) reinforce this heterogeneity by demonstrating that informal enterprises range from subsistence activities to firms with stronger productive potential and therefore should not be treated as a uniform sector. McCaig and Nanowski (2019) further show that larger and more productive Vietnamese firms are more likely to formalize, indicating that formal status is partly associated with enterprise development itself. Informality therefore persists because firms occupy different productive positions and respond differently to market opportunities and regulation. Policies focused only on lowering registration costs are unlikely to generate uniform results when firm capabilities, growth prospects and access to expanding markets differ substantially.

Ulyssea (2020) shows that informal firms operate along several margins and that their persistence reflects interactions among taxation, enforcement, productivity, firm selection and labor allocation. His synthesis implies that formalization policy should distinguish between low-

productivity subsistence activities and more productive firms deliberately avoiding regulation. McCaig and Pavcnik (2015) add that rapid economic growth and structural transformation can move workers from household businesses toward registered enterprises when more productive formal employment opportunities expand. Erten et al. (2019) provide an important qualification by showing that trade liberalization can generate uneven local labor-market adjustment, with displaced workers facing different opportunities depending on local economic structures. Rothenberg et al. (2016) similarly emphasize that informal firms vary widely in motivation and development potential. The relationship between structural change and formalization is therefore not automatic. Trade and growth can expand formal employment, but workers and firms benefit differently depending on local demand, enterprise productivity and adjustment capacity. Reducing informality consequently requires policies that combine market expansion with support for productive firm development and worker reallocation.

McCaig and Nanowski (2019) demonstrate that formalization is systematically associated with business size, productivity and economic performance, suggesting that enterprise development can precede or facilitate movement into formal status. Ulyssea (2018) reinforces this interpretation by showing that reducing formalization costs alone cannot eliminate informality because taxation, enforcement and productivity jointly shape firms' choices. McCaig and Pavcnik (2015) further show that broader economic transformation can reallocate workers toward formal enterprises when expanding sectors generate more attractive employment opportunities. Erten et al. (2019) add that such reallocation remains spatially uneven because local labor markets differ in their capacity to absorb workers displaced by external shocks. Informality therefore reflects both firm-level characteristics and the structure of available employment opportunities. More effective policy needs to address regulatory costs while simultaneously supporting productive firms, expanding formal-sector demand and improving workers' capacity to move toward new activities. Formalization is more likely to persist when it is supported by genuine improvements in productivity and labor demand rather than by registration incentives alone.

1.3. Formalization incentives, administrative costs, and institutional conditions

Benhassine et al. (2018) show that simplified registration and information alone produce only modest formalization effects, whereas more intensive packages combining registration with additional services generate stronger responses. Their findings imply that informal firms are more likely to formalize when legal status is associated with tangible economic benefits rather than administrative compliance alone. De Andrade et al. (2016) reinforce this conclusion by showing that information and free assistance have limited effects in Brazil, while inspections generate a stronger response, indicating that enforcement credibility enters directly into firms' compliance decisions. Galiani et al. (2017) add that financial incentives can affect registration behavior in Colombia, although responses vary according to enterprise characteristics and the perceived value of becoming formal. Floridi et al. (2020) further demonstrate through meta-analytic evidence that formalization interventions generally produce limited and heterogeneous effects when they address only registration barriers. Formalization policy therefore needs to influence the broader cost-benefit calculation faced by informal businesses. Lower administrative burdens can help, but stronger responses are more likely when compliance is credible and formal status provides services, protection or market opportunities that firms consider economically valuable.

El Hamidi et al. (2021) demonstrate that institutional trust and favorable perceptions of regulation increase intentions to formalize in Morocco, introducing a legitimacy dimension that cannot be reduced to financial incentives or enforcement. Their findings imply that informal actors evaluate not only the direct costs of compliance but also whether public institutions are sufficiently credible and supportive to justify participation. Williams (2015) provides a broader

cross-country foundation by showing that informal employment across less-developed economies is closely connected to institutional arrangements, state capacity and the relationship between formal rules and socioeconomic conditions. Rocha et al. (2018) add that reducing taxes and administrative burdens can increase formalization in Brazil, while effects occur through both existing firms and new-entry decisions. De Andrade et al. (2016) further show that enforcement matters when information and assistance alone fail to produce substantial behavioral change. Informality therefore reflects an interaction between regulatory costs, institutional credibility and enforcement capacity. Policies are more likely to alter formalization decisions when firms perceive formal institutions as legitimate while also facing a regulatory environment in which the benefits of compliance and the consequences of remaining informal are sufficiently clear.

Rocha et al. (2018) show that reductions in taxes and administrative burdens can stimulate formalization, but their findings also demonstrate that policy effects operate through several margins, including existing businesses, new firm entry and formal employment. This implies that aggregate registration rates may conceal important differences in how firms respond to reform. Floridi et al. (2020) reinforce the need for this broader perspective by showing that interventions focused narrowly on information or registration simplification tend to generate weak average effects. Williams (2015) adds that informality is embedded in wider institutional and socioeconomic conditions, meaning that formal rules are less effective when state capacity or institutional legitimacy remains weak. Galiani et al. (2017) further demonstrate that even financial incentives produce heterogeneous responses because firms differ in the value they attach to formal status. Effective formalization strategies therefore require differentiated combinations of cost reduction, credible enforcement and meaningful institutional benefits. Uniform policies are unlikely to generate broad compliance when enterprises face different economic constraints and hold different expectations about the advantages of entering the formal sector.

2. Employment Vulnerability and Unequal Labor-Market Outcomes

2.1. Poverty, job quality, income security, and social protection

Sehnbruch et al. (2020) show that employment quality should be assessed through several dimensions, including earnings, stability, working conditions and social protection, rather than through the simple distinction between employment and unemployment. Their framework implies that informal workers can remain economically vulnerable even when they are continuously employed. Canelas (2019) reinforces this perspective by demonstrating that poverty and informality are closely related in Ecuador but are not equivalent, since household and individual characteristics also influence economic deprivation. Hussain et al. (2023) add a health-protection mechanism by showing that informal workers in Pakistan face greater vulnerability to catastrophic health expenditure because employment-linked insurance and related protections are often absent. Chowdhury and Goli (2025) further demonstrate that older informal workers in India bear a heavier relative burden from out-of-pocket healthcare payments because their income and protection positions are weaker. Informality therefore affects welfare through several interconnected channels. Lower earnings, unstable employment and limited social insurance can combine with household vulnerability and health shocks, meaning that formalization alone cannot eliminate poverty unless it is accompanied by improvements in employment quality and access to protection.

Gerard and Gonzaga (2021) show that informality changes workers' responses to unemployment insurance because beneficiaries can move into informal employment while continuing to receive formal benefits. Their findings imply that social-insurance systems designed around fully observable employment may generate unintended behavioral responses in economies

where informal work is widespread. Bergolo and Cruces (2021) identify a related mechanism in Uruguay by showing that eligibility rules for social assistance can reduce registered employment among some beneficiaries when informal work offers an alternative source of income. Argente and García (2015) further demonstrate that formal-sector fringe benefits cannot be valued solely at their statutory cost because workers differ in preferences, outside options and access to informal jobs. Canelas (2019) adds that moving workers into formal employment does not automatically remove poverty when earnings capacity and household circumstances remain unfavorable. Social-protection design therefore needs to account for workers' ability to move between observed formal employment and less visible informal activity. Benefits, contributions and eligibility rules can alter labor allocation, making institutional design important for avoiding incentives that unintentionally reinforce segmentation.

Chowdhury and Goli (2025) demonstrate that the consequences of informality can become especially severe later in life because equivalent healthcare expenditures represent a heavier financial burden for older workers with weaker income security and limited protection. Hussain et al. (2023) provide a similar mechanism by showing that informal employment can transform health shocks into substantial household financial risks when insurance coverage is absent. Sehnbruch et al. (2020) place these outcomes within a broader employment-quality framework in which social protection is one dimension alongside earnings and stability. Gerard and Gonzaga (2021) further show that protection systems must be designed around the reality of frequent movement between formal and informal work rather than assuming stable employment categories. The welfare consequences of informality therefore extend well beyond wage differentials. They include unequal exposure to health expenditure, limited insurance coverage and weaker capacity to absorb adverse shocks. Reducing vulnerability requires social-protection arrangements capable of reaching workers whose employment trajectories move across formal and informal segments rather than attaching adequate protection exclusively to standard registered employment.

2.2. Gender, youth, rural employment, and unequal access to opportunities

Lo Bue et al. (2022) show that women are disproportionately concentrated in vulnerable forms of employment across developing countries, demonstrating that gender inequality concerns employment quality as well as labor-force participation. Their findings imply that increasing women's economic activity does not necessarily improve security when access to stable wage employment remains limited. Islam and Amin (2023) reinforce this perspective by showing that female-managed informal enterprises face productivity disadvantages associated with unequal resources, business characteristics and operating environments. Ed-Dib and El Hamidi (2019) add an institutional dimension by demonstrating that rural Moroccan women's entrepreneurial opportunities are constrained by sociocultural norms, patriarchal structures and restricted access to finance and networks, even when formal policies encourage participation. Ben Yahmed and Bombarda (2020) further show that trade liberalization can alter formal-employment probabilities differently for women and men, indicating that structural reforms redistribute labor-market vulnerability unevenly across gender groups. Gendered informality therefore reflects interactions among occupational allocation, institutional constraints, resource inequalities and economic restructuring. Policies focused solely on increasing female participation or formal registration may consequently leave substantial inequalities intact when women continue to face weaker access to productive assets, secure employment and market opportunities.

Pritadrajati et al. (2021) demonstrate that unemployment and informal self-employment can generate persistent scarring effects, meaning that adverse early labor-market experiences may influence later occupational and earnings trajectories. Their findings imply that informal self-employment should not automatically be interpreted as successful entrepreneurship when it

results from limited access to formal opportunities. Das (2025) reinforces this life-course perspective by showing that human-capital investment can improve young workers' prospects of escaping vulnerable informal employment, although its effectiveness depends on prevailing labor-market conditions. El Hamidi and Ed-Dib (2020) broaden the argument through a capability framework in which education, productive resources, equal opportunities and favorable public policies support women's economic empowerment. Lo Bue et al. (2022) further demonstrate that vulnerability remains disproportionately concentrated among women across developing economies. Early informal employment can therefore interact with gender and limited capabilities to create cumulative disadvantage. Education and skills are important for mobility, but they produce stronger outcomes when workers also possess access to productive resources, institutional support and sufficiently developed formal-sector opportunities.

El Hamidi and Ed-Dib (2020) show that economic autonomy depends on a wider capability environment encompassing education, equal opportunities, productive resources, living conditions and supportive public policy. Their findings imply that employment status alone provides an incomplete measure of vulnerability because workers may remain constrained even when economically active. Ben Yahmed and Bombarda (2020) demonstrate that trade shocks can modify formal-informal allocation differently across genders, showing how broader economic reforms interact with existing inequalities. Islam and Amin (2023) add that female-managed informal enterprises experience productivity gaps linked partly to resource and market-access disadvantages, which can weaken their ability to progress toward more productive activities. Das (2025) further emphasizes that human-capital investment can improve young workers' access to better employment but cannot operate independently of labor-market conditions. Vulnerable employment therefore results from the interaction of individual capabilities, gendered institutions and structural economic opportunities. Reducing informality-related inequality requires not only education or formalization measures but also improved access to finance, productive assets, secure employment and institutions that allow disadvantaged workers to convert acquired capabilities into sustained economic advancement.

2.3. Economic shocks, crises, and informality as buffer or vulnerability mechanism

Köhler et al. (2023) show that stricter lockdown measures in South Africa produced employment losses concentrated disproportionately among informal workers, while corresponding effects in formal employment were considerably weaker. Their findings imply that regulatory shocks can amplify pre-existing labor-market segmentation when workers lack contractual security and cannot perform activities permitted under emergency restrictions. Bassier et al. (2021) reinforce this interpretation by demonstrating that many informal workers were excluded from conventional employment-insurance systems, making emergency assistance difficult to deliver during the COVID-19 crisis. Narula (2020) broadens the institutional problem by showing that economies with large informal sectors simultaneously face greater demand for public support and weaker administrative capacity to identify and compensate vulnerable workers. Pitoyo et al. (2021) add worker-level evidence from Indonesia, where informal employees experienced substantial reductions in working hours and income despite adopting multiple livelihood strategies. Informal employment therefore provides flexibility without necessarily generating resilience. During large aggregate shocks, the absence of employment protection, social insurance and reliable administrative visibility can transform pre-existing informality into a major source of economic vulnerability.

Maurizio et al. (2023) demonstrate that informal employment did not initially perform its traditional countercyclical role during the COVID-19 crisis in Latin America because containment measures restricted many face-to-face activities concentrated in the informal economy. Their

findings show that the function of informality changes across phases of a crisis, since informal work became more important as an employment-absorption mechanism during recovery. Guo et al. (2022) similarly show that China's informal economy could absorb displaced activity under some conditions while remaining highly vulnerable to mobility restrictions, declining demand and weak protection. Köhler et al. (2023) further demonstrate that stringent restrictions disproportionately reduced informal employment in South Africa, confirming that flexibility does not guarantee protection against economy-wide regulatory shocks. Thanh and Duong (2022) add a gendered perspective by showing that Vietnamese women street vendors experienced sharp income losses because reduced customer flows interacted with limited savings, household responsibilities and weak access to public support. Informality should therefore be understood as a conditional adjustment mechanism whose capacity to absorb shocks depends on the nature of restrictions, sectoral activity and workers' access to economic and institutional resources.

Thanh and Duong (2022) show that crisis vulnerability among women street vendors reflects the intersection of informal status, gendered responsibilities and limited social protection rather than informality alone. Their findings imply that workers located within the same informal economy can experience very different capacities to absorb shocks. Pitoyo et al. (2021) reinforce this perspective by showing that informal workers in Yogyakarta adopted various coping strategies after reductions in hours and income, yet these strategies remained insufficient against prolonged disruption. Bassier et al. (2021) demonstrate why such individual adaptation has limits when workers remain outside formal systems of insurance and administrative registration. Maurizio et al. (2023) further show that informal employment may regain an absorptive role during economic reopening even after functioning as a vulnerability amplifier during the contraction phase. Crisis resilience in informal labor markets therefore depends on both worker adaptability and institutional coverage. Social-protection systems capable of reaching workers independently of standard payroll relationships are particularly important when shocks interrupt the daily economic activities on which informal households depend.

3. Labor-Market Regulation and Pathways toward Formalization

3.1. Minimum wages, employment protection, and regulatory design

Ham (2018) indicates that minimum-wage regulation can alter the allocation of employment between formal and informal sectors when statutory wage increases become binding for formal employers. The implication is that the effect of regulation cannot be reduced to changes in earnings, since firms may respond through employment reallocation when compliance raises labor costs. This interpretation can be connected to Broecke et al. (2017), whose evidence from emerging economies shows that average employment effects are generally limited but vary considerably according to the level of the wage floor, enforcement capacity, and the characteristics of affected workers. Betcherman (2015) reinforces this conditional perspective by showing that neither complete deregulation nor uniformly strict regulation produces predictable outcomes across developing countries. Moderate standards may protect workers without generating substantial employment losses, whereas poorly calibrated rules may encourage avoidance or exclusion. Hohberg and Lay (2015) further qualify the relationship between minimum wages and informality by showing in Indonesia that wage effects can extend across formal and informal labor markets without producing the large destruction of formal employment predicted by stronger competitive models. Taken together, these contributions imply that employment reallocation, wage transmission, and informality depend primarily on how regulatory requirements interact with enforcement, sectoral structures, and employers' capacity to absorb higher labor costs.

Menon and Rodgers (2017) extend the implications of minimum-wage regulation by demonstrating that its consequences may differ between male and female workers, meaning that aggregate employment or earnings indicators can conceal substantial distributional differences. This perspective is complemented by del Carpio et al. (2019), who show that the consequences of minimum wages should also be considered at the household level because gains and losses vary according to workers' labor-market status and exposure to regulation. Their findings imply that movements between covered and uncovered employment arrangements may transmit regulatory effects beyond formal-sector employment statistics. Katzkowicz et al. (2021) provide a related implication by focusing on low-skilled workers located near the wage threshold, where responses may occur through employment and compliance margins rather than wages alone. Such workers may therefore experience regulatory exclusion differently from workers positioned higher in the earnings distribution. Broecke et al. (2017) place these heterogeneous responses within a broader emerging-economy framework, showing that minimum-wage effects vary across worker groups and institutional settings rather than following a uniform pattern. Considered jointly, these studies imply that the consequences of wage regulation should be assessed across employment, earnings, compliance, household welfare, gender, and skill groups, because aggregate outcomes may obscure the unequal ways in which regulation affects workers situated differently within formal and informal labor markets.

3.2. Labor inspections, enforcement capacity, and regulatory compliance

Ponczek and Ulyssea (2022) show that stronger enforcement of labor regulation can reduce informality by limiting firms' capacity to rely on unregistered employment, but they also demonstrate that this effect may intensify employment and plant-level adjustments when firms are exposed to adverse competitive shocks. This implies that enforcement cannot be assessed independently of firms' economic environment, because the same mechanism that strengthens compliance may also constrain adjustment possibilities. Kanbur and Ronconi (2018) provide a broader institutional interpretation by distinguishing legal regulation from effective regulation and showing that strong statutory provisions do not necessarily generate strong worker protection when enforcement remains weak. Their argument implies that the practical consequences of labor regulation depend on the interaction between rules and implementation rather than on legislative strictness alone. Almeida and Ronconi (2016) reinforce this distinction by documenting substantial cross-country differences in labor-inspection intensity among developing economies, indicating that similar statutory frameworks may produce divergent compliance outcomes when enforcement capacities differ. Ham (2015) offers evidence from Honduras that illustrates this gap directly, showing that workers may receive wages below the legal minimum despite the existence of statutory protections. Together, these contributions imply that effective labor regulation depends on inspection capacity, actual compliance, economic conditions, and the ability of institutions to translate formal standards into protections experienced by workers.

Viollaz (2018b) demonstrates that the effectiveness of labor inspections also depends on the structure of the regulatory framework itself, particularly when legal obligations vary according to firm size. The implication is that inspections can increase compliance while simultaneously interacting with regulatory thresholds that shape firms' hiring, growth, and adjustment decisions. This institutional complexity is complemented by do Prado et al. (2025), who show that labor inspections in Brazil can increase formal employment by inducing firms to register workers, while compliance costs may subsequently affect firm performance and survival. Enforcement therefore produces consequences that extend beyond immediate formalization and may influence the longer-term viability of vulnerable firms. Viollaz (2018a) adds a distributional dimension by showing that stronger enforcement does not necessarily affect male and female

workers in the same way because employers may adjust workforce composition, employment arrangements, and contractual forms in response to inspections. Kanbur and Ronconi (2018) provide the conceptual link between these findings by emphasizing that effective regulation emerges from the interaction between statutory provisions and their implementation. Considered jointly, these studies imply that inspection policy should not be evaluated solely through average compliance rates. Its consequences also depend on regulatory thresholds, firm adjustment capacity, employment composition, gender differences, and the costs associated with moving from informal to formally regulated employment.

3.3. Integrated institutional, fiscal, digital, and financial pathways to formalization

Morales and Medina (2017) show that reducing payroll taxes associated with registered employment can strengthen incentives for formal job creation, implying that the cost structure of formal employment is an important component of policies intended to reduce labor-market segmentation. Their findings suggest that social-protection financing and employment regulation should be considered jointly when payroll contributions create a substantial cost difference between formal and informal labor. Duval and Loungani (2021) broaden this implication by emphasizing that labor-market institutions in emerging and developing economies must reflect administrative capacity, worker vulnerability, and the prevalence of informality. Their contribution indicates that regulations designed for advanced economies cannot simply be transferred to settings where enforcement and social-protection systems operate differently. Sen et al. (2022) further extend this perspective by presenting informality as the outcome of interactions among firms, workers, institutions, regulation, and social-protection arrangements rather than as the consequence of a single regulatory failure. Rojas Cama et al. (2024) add the financial dimension by associating greater access to formal financial services with smaller informal sectors across countries. Together, these contributions imply that formalization requires coordinated interventions addressing employment costs, institutional capacity, social protection, firm conditions, and access to financial services rather than relying exclusively on stricter labor regulation.

Ait Hbib et al. (2021) demonstrate among unbanked informal workers in Morocco that FinTech adoption depends significantly on relative advantage, compatibility, perceived complexity, and observability, while trialability does not significantly influence adoption intentions. The implication is that access to formal financial systems depends not only on technological availability but also on whether digital services are understandable, adapted to users' circumstances, and perceived as offering concrete advantages. Kelikume (2021) complements this perspective across African countries by showing that digital financial inclusion, mobile penetration, internet use, informality, and poverty are interconnected, suggesting that digital technologies can improve economic participation even before conventional formal status is achieved. Lv et al. (2024), however, show that the relationship between digital-economy development and informality is nonlinear, since some digital channels may initially expand entrepreneurial or platform-based activities while stronger financial traceability and institutional development may subsequently reduce informal activity. Sen et al. (2022) provide the broader framework connecting these findings by emphasizing that informality persists through interacting economic and institutional mechanisms. Considered together, these studies imply that digitalization should not be treated as an automatic route to formalization. Its effects depend on accessibility, financial inclusion, digital capabilities, institutional development, market transparency, and the wider conditions shaping the choices of informal workers and enterprises.

4. Discussion

The literature reviewed in this paper indicates that informality in developing economies is better understood as a persistent and heterogeneous labor-market configuration than as a temporary residual sector. Meghir et al. (2015) and Haanwinckel and Soares (2021) show that formal and informal employment coexist through interactions among worker heterogeneity, firm productivity, regulatory costs, and selection mechanisms. This interpretation is reinforced by Danquah et al. (2021) and Gutierrez et al. (2019), who demonstrate that mobility between formal and informal employment is possible but remains strongly conditioned by workers' characteristics, employment histories, and the type of informal activity. Education also emerges as an important determinant of mobility, as shown by Sugiharti et al. (2022), while Bobba et al. (2021, 2022) emphasize that informal employment can influence both subsequent human-capital accumulation and earlier schooling decisions. At the firm level, Ulyssea (2018, 2020), Rothenberg et al. (2016), and McCaig and Nanowski (2019) demonstrate that informal enterprises differ substantially in productivity, growth potential, and incentives to formalize. Consequently, formalization should not be approached through uniform registration policies. Sustainable transitions toward formality depend on productive transformation, better employment opportunities, improved worker capabilities, and institutional conditions that make formal participation economically advantageous.

A second implication concerns the close relationship between informality and employment vulnerability. The reviewed evidence suggests that the consequences of informal employment cannot be evaluated solely through wage differentials because vulnerability also concerns employment stability, social protection, access to healthcare, and the capacity to absorb economic shocks. Sehnbruch et al. (2020) emphasize this multidimensional nature of job quality, while Canelas (2019) shows that informality and poverty are closely associated without being equivalent. Hussain et al. (2023) and Chowdhury and Goli (2025) further demonstrate how limited insurance coverage exposes informal workers to greater financial risks arising from healthcare expenditure. These disadvantages are also unequally distributed across demographic groups. Lo Bue et al. (2022) document women's disproportionate concentration in vulnerable employment, whereas Islam and Amin (2023) identify productivity constraints affecting female-managed informal enterprises. In Morocco, Ed-Dib and El Hamidi (2019) underline how sociocultural norms, financial constraints, and limited access to networks restrict women's entrepreneurial opportunities. Crisis episodes reinforce these structural vulnerabilities. Köhler et al. (2023), Bassier et al. (2021), and Maurizio et al. (2023) show that informal workers experienced particularly severe employment and income losses during COVID-19. Informality may therefore provide labor-market flexibility, but flexibility without adequate protection can translate into considerable economic insecurity.

The findings reviewed also suggest that labor-market regulation has conditional rather than uniform effects on informality and formal employment. Ham (2018), Broecke et al. (2017), and Hohberg and Lay (2015) demonstrate that minimum wages can influence earnings and formal-informal employment allocation, but their effects depend on enforcement intensity, wage levels, and firms' capacity to absorb additional labor costs. Menon and Rodgers (2017) further show that regulatory consequences may differ by gender, while del Carpio et al. (2019) indicate that household-level welfare effects can diverge from aggregate employment responses. Enforcement presents similar trade-offs. Ponczek and Ulyssea (2022), Almeida and Ronconi (2016), and Viollaz (2018a, 2018b) show that stronger inspections can improve compliance, although firms may respond through employment, workforce-composition, or production adjustments. These findings support the distinction made by Kanbur and Ronconi (2018) between statutory regulation and effective regulation. Formalization therefore requires a broader institutional

strategy. Morales and Medina (2017) emphasize payroll-cost reductions, Sen et al. (2022) advocate an integrated approach involving firms, workers, institutions, and social protection, while Rojas Cama et al. (2024), Ait Hbib et al. (2021), and Kelikume (2021) highlight financial and digital inclusion. Effective formalization thus depends on combining proportionate regulation, credible enforcement, productive development, social protection, and accessible financial institutions rather than relying on a single policy instrument.

Conclusion

This paper shows that informality, employment vulnerability, and labor-market regulation are closely interconnected dimensions of labor-market functioning in developing economies. Informality cannot be reduced to the absence of registration or to a temporary stage preceding formal employment. The evidence reviewed indicates that it results from interactions among worker characteristics, firm productivity, institutional quality, regulatory costs, enforcement capacity, and the availability of productive formal employment. Formal and informal activities therefore coexist within segmented but permeable labor markets in which mobility remains highly unequal. Education, human-capital accumulation, enterprise capabilities, access to markets, and employment history influence workers' and firms' capacity to move toward formality. At the same time, informal employment often exposes workers to lower job quality, weaker income security, limited social protection, and greater vulnerability to economic and health shocks. These disadvantages are particularly pronounced among women, young workers, rural populations, and workers with limited access to productive resources. The reviewed literature consequently suggests that reducing informality requires more than administrative registration reforms. It requires policies capable of improving both the economic attractiveness of formal employment and the institutional conditions supporting sustained participation in regulated labor markets.

The analysis also demonstrates that labor-market regulation produces differentiated effects depending on institutional and economic conditions. Minimum wages, employment protection, inspections, taxation, and payroll contributions can improve labor standards and encourage formalization, but poorly calibrated regulation may also increase avoidance, employment reallocation, or adjustment costs for vulnerable firms. The effectiveness of regulation therefore depends not only on the legal provisions adopted but also on enforcement capacity, firm productivity, social-protection design, and the credibility of public institutions. The literature further points toward the relevance of complementary instruments, including payroll-tax reform, financial inclusion, digital technologies, institutional trust, and accessible social protection. Formalization should consequently be treated as a coordinated development process rather than as a narrow compliance objective. Policies are more likely to generate durable outcomes when they combine proportionate regulation with productive transformation, credible enforcement, broader social insurance, and improved access to financial and digital services. Future research should examine these interactions more systematically across countries and worker categories, particularly by considering how digitalization, demographic change, economic shocks, and evolving forms of employment reshape the boundary between formal and informal work. Such an approach can provide a more complete basis for designing labor-market institutions adapted to the structural conditions of developing economies.

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