

DOI: 10.5281/zenodo.122.126161

# DIGITAL GOVERNANCE, GOVERNANCE QUALITY, AND SOCIAL PROTECTION EFFECTIVENESS IN LMICS: A MULTIGROUP COMPARATIVE ANALYSIS OF POVERTY REDUCTION IN INDONESIA AND BANGLADESH

Suci Megawati<sup>1\*</sup>, Wiwik Sri Utami, Jauhar Wahyuni<sup>3</sup>, Kuntala Chowdhury<sup>4</sup>, Muhammad Alfarizi<sup>5</sup>, Muhammad Chaeroel Ansar<sup>6</sup>

<sup>1</sup>Department of Public Administration, Faculty Of Social Science and Political Science, Universitas Negeri Surabaya, Surabaya, Indonesia

<sup>2</sup>Department of Geography Education, Faculty Of Social Science and Political Science, Universitas Negeri Surabaya, Surabaya, Indonesia

<sup>3</sup>Department of Communication Science, Faculty Of Social Science and Political Science, Universitas Negeri Surabaya, Surabaya, Indonesia

<sup>4</sup>Department of Gender and Development Studies, Begum Rokeya University, Rangpur, Bangladesh

<sup>5</sup>Department of Business Management, Faculty of Creative Design and Digital Business, Institut Teknologi Sepuluh Nopember, Surabaya, Indonesia

<sup>6</sup>Department of Government Science, Hasanuddin University, Makassar, Indonesia

Received: 20/11/2025  
Accepted: 29/12/2025

Corresponding Author: Suci Megawati  
(sucimegawati@unesa.ac.id)

## ABSTRACT

Poverty reduction remains a persistent challenge in many lower-middle-income countries (LMICs), where limited institutional capacity, fragmented governance, and inefficiencies in social protection systems constrain development outcomes. Recent advances in digital governance offer new opportunities to strengthen social protection delivery through improved targeting, transparency, and administrative efficiency. However, existing studies tend to examine digital governance or governance quality in isolation, with limited empirical evidence on their combined influence on social protection effectiveness, particularly in LMIC contexts. Moreover, comparative analyses between countries with differing governance capacities remain scarce. This study aims to examine how digital governance and governance quality jointly influence the effectiveness of social protection programs and their contribution to poverty reduction in LMICs. Focusing on Indonesia and Bangladesh, the research adopts a multigroup comparative approach to capture both shared patterns and country-specific dynamics. Using a cross-sectional survey of 700 social protection beneficiaries and applying Partial Least Squares Structural Equation Modeling (PLS-SEM), the study tests direct, moderating, and comparative relationships among key constructs, complemented by multigroup analysis and importance-performance mapping. The results indicate that both digital governance and governance quality have positive and significant effects on social protection program effectiveness, with governance quality exerting a stronger influence. Effective social protection, in turn, contributes to poverty reduction, although the magnitude and significance of this relationship vary across countries. Multigroup analysis reveals that Indonesia

*demonstrates a stronger translation of program effectiveness into poverty reduction outcomes compared to Bangladesh, reflecting differences in institutional maturity and digital readiness. The moderation results further confirm that national context shapes the effectiveness of governance-driven reforms. These findings imply that digital transformation alone is insufficient to improve social protection outcomes without strong institutional foundations. Policymakers in LMICs should adopt integrated strategies that simultaneously strengthen digital governance and governance quality, tailored to country-specific capacities, to maximize the poverty-reduction impact of social protection systems.*

---

**KEYWORDS:** Digital governance; Governance quality; Social protection effectiveness; Poverty reduction; LMICs.

---

## 1. INTRODUCTION

Poverty reduction remains one of the most persistent development challenges faced by Lower-Middle-Income Countries (LMICs), where structural constraints, socio-economic vulnerabilities, and uneven access to essential services continuously undermine progress. Despite decades of interventions, poverty in many LMICs endures in multidimensional forms, manifesting in limited access to food, education, infrastructure, and basic services (Saboor et al., 2015; Tacoli, 2017). Rapid urbanization further intensifies deprivation in dense, underserved settlements, where inadequate infrastructure and environmental hazards exacerbate inequality (Sohnesen et al., 2022). At the same time, economic volatility, energy shortages, and rising inequality inhibit inclusive growth, trapping many LMICs in conditions that mirror the middle-income trap (Humphrey, 2006; Peerenboom, 2012). These structural issues converge with widening digital divides and weak institutional capacities that complicate the delivery of social protection systems (Barrientos, 2010). In an era marked by recurrent crises, especially pandemics, inflation spikes, climate-related shocks, and financial instability, the effectiveness of social protection systems becomes increasingly vital for safeguarding vulnerable populations (Barreix Sibils et al., 2024a). As digitalization and governance reforms reshape contemporary social policy landscapes, strengthening digital governance and institutional quality has emerged as a transformative pathway to enhance the effectiveness of social protection in LMICs.

Recent advances in digital governance are reshaping social protection delivery in developing countries through expanded e-government platforms, automated eligibility systems, digital identification, integrated data infrastructures, and digital payment channels (Anggono et al., 2025; Misuraca et al., 2021). Initiatives across China, India, Turkey, Malaysia, and Indonesia show how multi-service digital platforms can enhance service provision and reduce administrative inefficiencies (Das, 2025; H. Li, 2024; Nguyen et al., 2025; Sarjito, 2025; Wirtz et al., 2022). Automated decision-making tools improve beneficiary targeting and fraud detection by using real-time data analytics, although their performance relies on robust oversight and transparent algorithmic governance (Hilowle et al., 2024). Digital ID systems, supported by evolving regulations in regions such as Europe, Australia, and the United States, facilitate secure identity verification and more efficient access to public

services (Berbecaru et al., 2020). Integrated data infrastructures strengthen cross-agency coordination and support evidence-based policymaking, while digital payment systems enable faster and more transparent transfers that limit leakages and improve fiscal accountability (Kasimatis et al., 2024). Nonetheless, the benefits of digital transformation remain uneven, shaped by institutional capacity, regulatory coherence, and overall governance quality in LMICs.

Governance quality plays a foundational role in determining whether digital reforms translate into effective social protection outcomes, as it reflects the strength of the rule of law, government effectiveness, corruption control, public service quality, and institutional stability (Agnafors, 2013; Kouadio, 2025). High governance quality ensures that regulations are coherent, public institutions function predictably, and administrative processes support transparent and accountable service delivery (Dobrolyubova, 2020; Vian, 2020). In many developing countries, however, digital initiatives fail to achieve intended results due to weak regulatory frameworks, fragmented inter-institutional coordination, persistent corruption, and limited bureaucratic capacity, which undermine implementation and sustainability (Faozanudin et al., 2025). Corruption and political interference further distort targeting and resource flows, while low digital literacy and inadequately skilled personnel restrict operational reliability (Dwivedi et al., 2016). These conditions indicate that the effectiveness of digital governance in strengthening social protection systems depends heavily on the quality of underlying governance, making institutional robustness a critical enabler of poverty-focused digital transformation.

Empirical studies indicate that the effectiveness of social protection systems in LMICs is shaped by the interaction of governance quality, digital governance, program design, and macroeconomic conditions. Governance quality consistently emerges as a key determinant, as strong institutional capacity enables predictable implementation and responsive social protection spending, while weak governance constrains service delivery and social progress (Garcia-Sanchez et al., 2013; Liashenko et al., 2024). Evidence from Ethiopia further shows that local governance quality significantly affects targeting accuracy and beneficiary satisfaction (Vinci & Roelen, 2020). Digital governance plays an increasingly important role, with ICTs and digital platforms improving verification, payment automation, fraud reduction, and citizen oversight,

although uneven infrastructure and digital exclusion limit their impact (Holeman et al., 2016; Sanner et al., 2025). Cash transfer programs demonstrate mixed but generally positive effects on health, poverty, and vulnerability, strongly conditioned by institutional quality and public preferences (Pega et al., 2022; Vinci et al., 2022). Finally, broader economic dynamics, including export structures and exposure to shocks, influence social protection performance, particularly as a buffer against undernourishment during economic downturns (Barreix Sibils et al., 2024b; Gnanon, 2020).

Despite growing insights, substantial empirical and conceptual gaps remain in LMIC contexts. Existing research is heavily concentrated in high- and upper-middle-income countries, with limited systematic analysis of digital governance and governance quality in lower-middle-income settings. Studies often examine single programs, rely on fragmented approaches that isolate either digitalization or governance quality, and rarely assess their combined effects on overall social protection effectiveness. Cross-country comparisons within LMICs are also scarce, particularly for Indonesia and Bangladesh—two populous countries facing high poverty burdens, rapid digital reforms, and differing governance capacities. Conceptually, the literature lacks an integrated framework that treats digital governance and governance quality as complementary mechanisms. Digital reforms are frequently analyzed without accounting for institutional capacity, while governance quality is examined independently of digital tools' poverty-reduction potential. No empirical study has jointly tested these dimensions. Addressing these gaps, this study provides empirical evidence on how digital governance and governance quality jointly shape social protection effectiveness in Indonesia and Bangladesh, using multigroup structural equation modeling to capture shared patterns and country-specific variations relevant to poverty reduction. Guiding this investigation are three central research questions:

RQ1. How does digital governance affect the effectiveness of social protection programs?

RQ2. How does governance quality influence the effectiveness of social protection programs?

RQ3. Do these governance-driven effectiveness gains contribute to poverty reduction, and do these relationships differ significantly between Indonesia and Bangladesh?

Indonesia and Bangladesh are selected as comparative cases because both are populous LMICs with high poverty levels and strong reliance on social

protection, yet they differ in governance capacity amid rapid digitalization. Indonesia has relatively advanced digital governance infrastructure, including the National ID (NIK), an integrated social registry (DTKS), and digital benefit delivery, while Bangladesh is progressing rapidly but with more uneven institutional capacity. These contrasts make them suitable for multigroup comparison. This study contributes theoretically by integrating digital governance and governance quality into a unified framework to explain social protection effectiveness. Practically, it offers evidence on how digital systems and institutional capacity jointly shape program performance. At the policy level, it provides comparative lessons for strengthening digital architecture, bureaucratic capability, and governance to enhance poverty reduction and resilience in LMICs.

## 2. THEORETICAL BACKGROUND AND HYPOTHESIS DEVELOPMENT

### 2.1. Social Protection Program in LMIC Country: An Overview

Social protection programs in low- and middle-income countries (LMICs) have expanded considerably, reflecting governments' growing commitment to reducing poverty, inequality, and vulnerability. These programs typically encompass cash transfers, social assistance, disability-inclusive schemes, and child protection systems, each designed to enhance household welfare under diverse socio-economic conditions. Conditional cash transfers have demonstrated substantial success in improving preventive healthcare use and encouraging healthy behaviors (Ranganathan & Lagarde, 2012), whereas unconditional transfers show more mixed effects but may still reduce illness and enhance resilience (Pega et al., 2017). Social assistance programs remain central yet face persistent challenges in reaching the poorest households (Schubert, 2020). Evidence from Africa and Asia indicates that disability inclusion remains limited due to insufficient program data and design gaps (Banks et al., 2017; Walsham et al., 2019).

Beyond cash-based approaches, LMICs have expanded child protection and welfare systems tailored to local contexts (Brown et al., 2025), although effectiveness varies across settings. Program outcomes also differ: while some systems show limited impact on poverty and inequality reduction, as in Azerbaijan (Habibov & Fan, 2006), others reflect a shift toward broader, investment-oriented social policy frameworks (Patel, 2018).

Significantly, social protection is associated with significant improvements in child mortality and health indicators across LMICs (Z. Li et al., 2021). During crises such as COVID-19, these interventions acted as critical buffers against income insecurity (Chen, 2024a). Collectively, the literature underscores that although social protection in LMICs improves welfare outcomes, persistent gaps remain in inclusivity, coverage, adequacy, and long-term sustainability.

## 2.2. Institutional Theory

Institutional Theory offers a foundational lens for understanding how formal rules, organizational arrangements, and sociopolitical structures shape policy performance and development outcomes. Classic contributions emphasize that institutions defined as formal regulations, bureaucratic capacities, normative expectations, and cognitive frames structure the incentives and behaviors of actors involved in public administration (Scott, 2005). These institutional arrangements generate patterned routines that influence how policies are designed, implemented, and adapted in response to contextual demands. They also embed organizations within broader social environments, where coercive, normative, and mimetic pressures encourage conformity to dominant practices and governance norms (Southall & Southall, 2024). As institutions evolve, they reflect shifting ideologies, power relations, and organizational learning processes, shaping both opportunities and constraints for public-sector innovation (Alvesson et al., 2019).

Within this perspective, digital governance and governance quality can be conceptualized as institutional arrangements that structure the effectiveness of social protection delivery systems. Digital governance frameworks, including information management systems, integrated registries, and digital verification processes, constitute techno-institutional infrastructures that alter bureaucratic routines, enhance transparency, and reduce transaction costs (Hanisch et al., 2023). Similarly, governance quality reflects the integrity, responsiveness, and coordination capacities embedded in public institutions, which determine governments' ability to implement inclusive and adaptive social protection programs (Vinci & Roelen, 2020). In low- and middle-income countries, where institutional heterogeneity is pronounced, variations in bureaucratic capacity, digital infrastructure, and governance norms significantly shape policy outcomes, reinforcing the relevance of institutional theory for comparative analysis (Umbach & Tkalec,

2022).

For Indonesia and Bangladesh, institutional differences manifest in administrative structures, digitalization trajectories, and governance practices, generating divergent pathways for social protection performance. Understanding these institutional configurations is therefore essential for explaining why similar programs may yield different levels of effectiveness and contribute unevenly to poverty reduction. Through this lens, institutional theory offers a robust framework for analyzing how digital governance and governance quality interact with country-specific contexts to influence the effectiveness of social protection in LMICs.

## 2.3. The Influence of Digital Governance on Social Protection Program Effectiveness

Digital governance refers to the strategic integration of ICT into governmental processes to enhance transparency, efficiency, and citizen-state interactions (Maheshwari et al. 2025; Yuan & Gu, 2025; Suci et al., 2025). Its core elements: information infrastructures, interoperability, digital identification, and participatory interfaces, enable governments to streamline service delivery, strengthen administrative control, and expand public value (Hamid et al., 2019; Sukhwai & Kankanhalli, 2022). Philosophically, the digital governance effectiveness nexus is grounded in utilitarian and justice-oriented principles: the use of digital systems maximizes efficiency and inclusivity, promotes fair resource allocation, and reduces discretion-driven errors, while simultaneously empowering citizens through greater informational access and participatory opportunities (Ranchordás, 2022; Wang et al., 2025). Such foundations align with broader public value and accountability norms, in which digital tools serve as mechanisms to reinforce transparency and reduce corruption.

Empirically, digitalization consistently improves the performance of social protection systems. Integrated information systems enhance targeting accuracy, administrative integrity, and timeliness of benefit delivery (Crăciun et al., 2023). Evidence from South Africa shows that digital IDs and automated payments reduce leakages and improve equality outcomes, despite persistent infrastructural constraints (Vujovic et al., 2024). Studies from Vietnam and New Zealand demonstrate that digital platforms increase trust, transparency, and citizen engagement, amplifying program legitimacy (Asgarkhani & Wan, 2007; Hien et al., 2024). At the same time, research cautions against risks of digital exclusion among vulnerable populations, especially

the elderly and digitally marginalised (Gualavisí, 2024; Onyango & Ondiek, 2023).

With the philosophical relationship and the empirical evidence above, this study proposes the following first hypothesis:

Hypothesis 1. Digital governance has a positive and significant influence on the effectiveness of social protection programs.

#### **2.4. The Influence of Governance Quality on Social Protection Program Effectiveness**

Governance quality refers to the effectiveness, efficiency, and ethical standards through which public institutions formulate and implement policies, grounded in principles of the rule of law, transparency, accountability, and moral legitimacy (Agnafors, 2013; Dobrolyubova & Yuzhakov, 2021). High-quality governance is operationalized through dimensions such as government effectiveness, regulatory quality, corruption control, and institutional robustness, all of which shape the capacity of states to deliver services equitably (Kordić et al., 2019; Luo et al., 2024). Philosophically, governance quality underpins the effectiveness of social protection because programs depend on predictable, credible, and fair state actions. Effective institutions reduce leakages, ensure accurate targeting, cultivate public trust, and enable adaptive program design—conditions essential for redistributive interventions to generate meaningful welfare outcomes (Lockwood, 2010; Ma et al., 2024).

Cross-country analyses show that stronger governance correlates with higher social development and improved service access (Liashenko et al., 2024). Case studies reveal that institutional quality enhances implementation fidelity, as demonstrated in Ethiopia's PSNP, where local governance structures significantly shaped program outcomes (Vinci & Roelen, 2020). Conversely, weak coordination and limited administrative capacity, such as observed in Botswana, undermine program delivery (Gunhidzirai & Rankopo, 2025). Broader findings indicate that governance deficits diminish the poverty-reduction impact of social spending (Ben Mimoun & Raies, 2022), while improvements in regulatory quality and accountability accelerate progress toward SDGs (Bisogno et al., 2025).

With the philosophical relationship and the empirical evidence above, this study proposes the following second hypothesis:

Hypothesis 2: Governance quality has a positive and significant influence on the effectiveness of social protection programs.

#### **2.5. The Effect of Social Protection Program Effectiveness on Poverty Reduction**

Social protection program effectiveness refers to the extent to which interventions enhance household well-being by strengthening capabilities, reducing vulnerability, and generating measurable improvements across multidimensional poverty indicators. Rooted in the capability approach, effective programs expand individuals' substantive freedoms to achieve valued outcomes (Barrientos, 2010), while incorporating targeting accuracy, inclusivity, flexibility, and equitable benefit adequacy (Janzen et al., 2016; Waqas & Awan, 2017). Comprehensive design and responsiveness to shocks further enhance resilience (Fahrudin et al., 2024), whereas strong institutional quality and community participation improve implementation fidelity (Vinci & Roelen, 2020). Sustainable financing and continuous monitoring ensure long-term program viability and adaptive learning (Bilan et al., 2025; Harris, 2013).

The link between program effectiveness and poverty reduction is grounded in transformative social protection principles, which view social protection not merely as a safety net but as an instrument for promoting social justice, empowerment, and human development (Sabates-Wheeler & Devereux, 2007). Effective programs stimulate consumption smoothing, productive investment, and accumulation of human capital, thereby enabling structural exits from poverty (Carraro & Marzi, 2021; Hypher & Richards, 2015). Enhanced access to health, education, and nutrition—particularly for children—supports long-term intergenerational (Owusu-Addo, 2016). Empirically, evidence from diverse contexts confirms that adequate social protection reduces poverty. Cash transfers in China and Brazil significantly lower poverty incidence (J. Singh et al., 2025; Wu & Ramesh, 2014). Integrated interventions in Kenya combining cash and insurance yield stronger poverty-reduction outcomes (Jensen et al., 2017), while programs in Tanzania and India demonstrably increase income and reduce vulnerability (Khosla & Jena, 2022; Komba & Kitole, 2025).

With the philosophical relationship and the empirical evidence above, this study proposes the following third hypothesis:

Hypothesis 3. Social protection program effectiveness has a positive and significant influence on Poverty Reduction.

#### **2.6. The Moderating Role of Country in the Relationship Between Digital Governance-**

### *Governance Quality and Social Protection Program Effectiveness*

Country context plays a pivotal moderating role in governance-related empirical research, as cross-national differences in institutional capacity, political stability, economic development, and cultural frameworks shape how governance reforms translate into policy outcomes. Prior studies demonstrate that governance quality interacts differently with policy instruments across countries, influencing whether reforms generate stability benefits or unintended distortions (Musa et al., 2024; Rizwan et al., 2024). Governance frameworks also determine the extent to which financial, environmental, and social policies effectively achieve their intended goals, with stronger institutional structures amplifying the positive effects of policy interventions (Bhutta et al., 2022; Saha & Dutta, 2023). These findings underscore that governance is not uniformly effective across contexts; rather, its performance is contingent upon broader institutional environments.

Within the domain of digital reforms, country context becomes even more critical. Within the digital public sector, the interplay between digital governance and governance quality is similarly conditioned by country-specific environments. Studies show that institutional robustness enhances the ability of ICT systems to improve service delivery, transparency, and accountability (Evans, 2023), while weaker institutions may limit digitalization benefits due to fragmented coordination, politicization, or regulatory gaps (Bugaychuk et al., 2024). Research on African and Asian economies further demonstrates that digital initiatives generate stronger developmental and sustainability outcomes when supported by high-quality governance frameworks (Oyedeko et al., 2025; Yuan & Gu, 2025). Conversely, the digital divide acts as a contextual barrier moderating the success of e-governance interventions (G. C et al., 2024).

In the domain of social protection, the moderating role of country context becomes especially salient. Political stability, institutional predictability, and cultural acceptance shape citizen engagement and trust in digital delivery systems, thereby influencing targeting accuracy, benefit uptake, and program credibility (Vinci & Roelen, 2020; Wang et al., 2025). Countries with stronger governance structures and clearer legal frameworks are better positioned to leverage digital systems for monitoring, coordination, and fraud prevention, resulting in higher program effectiveness. Thus, when comparing Indonesia and Bangladesh, differences in

governance capacity, digital maturity, bureaucratic capability, and regulatory enforcement provide a theoretically grounded rationale for expecting country to moderate the relationships between digital governance, governance quality, and social protection program effectiveness.

With the philosophical relationship and the empirical evidence above, this study proposes the following third hypothesis:

Hypothesis 4. Country Demographics Moderate the Relationship Between Digital Governance and Social Protection Program Effectiveness

Hypothesis 5. Country Demographics moderates the relationship between Governance Quality and Social Protection Program Effectiveness

To conclude this section, all five hypotheses that have been developed together form the integrated conceptual framework shown in Figure 1 as the main research model.

## **3. METHODOLOGY**

### *3.1. Research Design and Measurement of Instruments*

This study employs a quantitative cross-sectional survey design to examine how digital governance, governance quality, and social protection effectiveness influence poverty reduction in low- and middle-income countries. The unit of analysis consists of beneficiaries of major social protection programs in Indonesia and Bangladesh, enabling a comparative assessment across two distinct LMIC contexts. The cross-sectional approach allows systematic measurement of perceptions, program experiences, and governance conditions at a single point in time. This design is suitable for identifying structural relationships among variables and supports the multigroup comparative analysis used to test differences between the two country samples.

The research instrument was developed based on a synthesis of empirical literature related to digital governance, governance quality, effectiveness of social protection programs, and poverty reduction outcomes. The development of indicators refers to internationally tested indices and surveys, such as the Digital Governance Index, Worldwide Governance Indicators, as well as evaluation reports of social programs and national statistical institutions. The instrument was then validated through an Expertise FGD involving public policy academics, policy researchers, as well as government representatives from both countries to ensure contextual relevance and terminology suitability.

The questionnaire instrument consists of three main sections. The first section contains an

introduction to the research, the purpose of the survey, and the respondents' willingness sheet. The second section contains demographic information, including age, gender, education, occupation, and location. The third section is a core questionnaire consisting of Digital Governance Variables covering 12 indicators related to digital infrastructure, system integration, online transparency, and service inclusivity (Jezova, 2024; Kirton & Warren, 2021; W. Li et al., 2024; Misra & Panigrahi, 2014; Young, 2020). Governance Quality contains 12 indicators regarding responsiveness, bureaucratic capacity, regulatory quality, and supervisory integrity (Aisyah et al., 2024; Alsaad et al., 2024; Barbier & Burgess, 2021; Fang et al., 2023; Inusah et al., 2024; Jia et al., 2006; Y. Li & Shang, 2020; Nimer et al., 2022; V. Singh & Singh, 2018). The Social Protection Program Effectiveness variable consists of 9 indicators that assess the accuracy of targets, distribution efficiency, and welfare impact (Chen, 2024b; Costella et al., 2024; Menéndez González, 2021; Patel et al., 2023; Rahman et al., 2025b). Poverty Reduction is measured using three macro indicators from BPS/BBS and the World Bank (Chen, 2024b; Costella et al., 2024; Menéndez González, 2021; Patel et al., 2023; Rahman et al., 2025b). This structure is designed to obtain a comprehensive picture of digital governance performance, governance quality, program effectiveness, and macro impact on poverty.

### 3.2. Data Sample and Collection Procedures

The study population included households benefiting from social protection programs in Indonesia and Bangladesh. The sample drawing technique uses purposive sampling with the consideration that this study requires respondents who truly receive the benefits of the program and have direct experience with digital governance, quality governance, and the effectiveness of aid distribution. Therefore, the inclusion criteria include: (1) households recorded in the Social Protection

Program recipient database; (2) have experience in receiving assistance in the last two years; and (3) be willing to participate in the survey.

The total number of indicators measured through the survey was 33, so, based on SEM rules (5–10 respondents per indicator), a minimum of 165–330 respondents per country is needed. To maintain the robustness of the model and the validity of the multi-group analysis, this study targeted  $\pm 300$  respondents per country, resulting in a total sample of about 600 respondents. This target is also relevant considering that the coverage of Social Protection Program recipients in Indonesia reaches 75,073,000 people (Purba & Nugroho, 2025), while Bangladesh reaches about 50% of the population ( $\pm 170$  million) (Rahman et al., 2025a).

Data collection is carried out by independent enumerators in each country using a list of SPP recipients granted access permits by the relevant ministries. The survey process took place in August–November 2025 with the approval of respondents and research ethics standards, and has obtained FERCAPP ethics clearance from accredited ethics commission institutions in Indonesia.

The study collected a total of 700 respondents, 360 from Indonesia and 340 from Bangladesh, respectively. The characteristics of the respondents were relatively comparable between countries with the details in table 1. The majority of heads of households are male (62%), aged 35–44 (30%), and work in the informal sector (62%). Most households consist of 3–4 people (40%) with an even income distribution across the sample quartile. In terms of education, Indonesian respondents have a higher proportion of secondary education and diplomas, while Bangladesh has more respondents without school. The most widely accepted social protection program is cash assistance (55%), with the dominant duration of admission being more than three years. Geographically, Indonesian respondents mostly live in urban areas, while Bangladesh is dominated by rural areas.

*Table 1: Respondent Characteristics.*

Variable	Category	Indonesia n (%)	Bangladesh n (%)	Total n (%)
Gender of household head	Male	223 (61.9%)	211 (62.1%)	434 (62.0%)
	Female	137 (38.1%)	129 (37.9%)	266 (38.0%)
Age of household head (years)	< 25	29 (8.1%)	27 (7.9%)	56 (8.0%)
	25–34	101 (28.1%)	95 (27.9%)	196 (28.0%)
	35–44	108 (30.0%)	102 (30.0%)	210 (30.0%)
	45–54	72 (20.0%)	68 (20.0%)	140 (20.0%)
	$\geq 55$	50 (13.9%)	48 (14.1%)	98 (14.0%)
Education level (household head)	No schooling	18 (5.0%)	41 (12.1%)	59 (8.4%)
	Primary	108 (30.0%)	129 (37.9%)	237 (33.9%)
	Junior secondary	90 (25.0%)	75 (22.1%)	165 (23.6%)
	Senior secondary	101 (28.1%)	68 (20.0%)	169 (24.1%)
	Diploma or higher	43 (11.9%)	27 (7.9%)	70 (10.0%)

Employment status (household head)	Unemployed	65 (18.1%)	61 (17.9%)	126 (18.0%)
	Informal worker	223 (61.9%)	211 (62.1%)	434 (62.0%)
	Formal worker	72 (20.0%)	68 (20.0%)	140 (20.0%)
Household size	1-2 members	65 (18.1%)	61 (17.9%)	126 (18.0%)
	3-4 members	144 (40.0%)	136 (40.0%)	280 (40.0%)
	5-6 members	108 (30.0%)	102 (30.0%)	210 (30.0%)
	> 6 members	43 (11.9%)	41 (12.1%)	84 (12.0%)
Monthly household income (within-sample quartiles)	Lowest quartile	108 (30.0%)	102 (30.0%)	210 (30.0%)
	Lower-middle quartile	108 (30.0%)	102 (30.0%)	210 (30.0%)
	Upper-middle quartile	90 (25.0%)	85 (25.0%)	175 (25.0%)
	Highest quartile (in-sample)	54 (15.0%)	51 (15.0%)	105 (15.0%)
Type of social protection program received	Cash transfer	198 (55.0%)	187 (55.0%)	385 (55.0%)
	Food subsidy	72 (20.0%)	68 (20.0%)	140 (20.0%)
	Health insurance	54 (15.0%)	51 (15.0%)	105 (15.0%)
	Skills training/others	36 (10.0%)	34 (10.0%)	70 (10.0%)
Duration of benefit receipt	≤ 1 year	79 (21.9%)	75 (22.1%)	154 (22.0%)
	2-3 years	137 (38.1%)	129 (37.9%)	266 (38.0%)
	> 3 years	144 (40.0%)	136 (40.0%)	280 (40.0%)
Area of residence	Urban	173 (48.1%)	116 (34.1%)	289 (41.3%)
	Rural	187 (51.9%)	224 (65.9%)	411 (58.7%)

### 3.3. Data Analysis Technique

This study used Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS 4 software. The selection of PLS-SEM was based on its suitability for complex models with multiple constructs, the potentially non-normal nature of the data, and the research focus on prediction and theory development in developing-country contexts. (J. F. Hair et al., 2019). The analysis process begins with the evaluation of the Outer Model, including testing the reliability of the indicators, internal consistency validity, and convergent and discriminant validity (J. F. Hair et al., 2017). The next stage is the Inner Model, covering the testing of structural relationships, the values of the path coefficient,  $R^2$ ,  $Q^2$ , and mediating effects (J. F. Hair et al., 2019).

In addition to the fundamental analysis, this study applies advanced analysis to enrich the findings, namely: (1) a moderation test to see the influence of certain conditions on the relationship between variables; (2) Multi-Group Analysis (MGA) based on country comparison (Matthews, 2017); (3) Importance-Performance Map Analysis (IPMA) to identify policy priorities (Hauff et al., 2024); and (4) PLS-Predict to assess the predictive capabilities of the model on an out-of-sample basis (Shmueli et al., 2019). This technique ensures robust and practically relevant results.

## 4. RESULTS

### 4.1. Common Method Bias

Common method bias represents a recurring methodological concern in empirical studies that rely on self-reported data collected from a single source

using a cross-sectional design. This issue refers to spurious covariance attributable not to the constructs themselves but to the uniform data collection method employed within the same research context. To mitigate this concern, and following the methodological guidelines proposed, Harman's single-factor test was conducted (Howard et al., 2024). The analysis incorporated 33 measurement items representing five latent constructs related to digital governance, governance quality, social protection mechanisms, and poverty reduction outcomes.

The results indicated that no single factor emerged as dominant, with the first unrotated factor accounting for only 26.85% of the total variance—well below the 40% threshold commonly used to signal potential common method bias. This finding suggests that the observed relationships among the core constructs, particularly those linking digital governance practices, institutional quality, and the effectiveness of social protection programs in reducing poverty, are unlikely to be substantially influenced by common method variance.

To further minimize this risk, careful attention was paid to questionnaire design, ensuring that all survey items were concise, clear, and unambiguous. Although the sufficiency of Harman's single-factor technique has been questioned in the methodological literature, an additional robustness check was performed using a common latent factor (CLF) approach within the structural Equation modeling (SEM) framework. Comparisons of standardized regression weights estimated both with and without the CLF revealed no meaningful differences, thereby providing additional evidence that common method

bias does not pose a significant threat to the validity of the study's findings.

#### 4.2. Measurement Outer Model

The reflective measurement model was assessed in accordance with established guidelines (Hair et al., 2020; Hair et al., 2022). All latent constructs, Digital Governance (DG1-DG12), Governance Quality (GQ1-GQ12), and Social Protection Program Effectiveness (SPPE1-SPPE9) – demonstrated satisfactory indicator reliability, with item loadings exceeding the recommended 0.70 threshold (J. F. Hair et al., 2019). No indicators fell below acceptable limits; therefore, item deletion was not required. Internal consistency reliability was confirmed, as Cronbach's alpha, composite reliability ( $\rho_C$ ), and

reliability coefficient ( $\rho_A$ ) values for all constructs were above 0.70 (J. Hair et al., 2017), signifying strong consistency across indicators. Convergent validity was also supported, given that the AVE values for Digital Governance, Governance Quality, and Social Protection Program Effectiveness were all above 0.50 (J. F. Hair et al., 2019). Furthermore, the outer VIF values ranged between 1.13 and 1.49 across indicators, well below the threshold of 3–5 (Streukens & Leroi-Werelds, 2023), indicating the absence of multicollinearity concerns at the measurement level. For the poverty reduction construct – which includes the percentage of the population below the poverty line, the Gini ratio, and the Multidimensional Poverty Index – reliability testing was not applicable, as it is conceptualized as an index rather than a reflective construct.

**Table 2: Reliability and validity statistics.**

Variable	Outer Loadings	AVE	CA	CR	VIF Outer
<i>Digital Governance</i>					
DG1	0.742	0.569	0.750	0.756	1.206
DG2	0.751				1.242
DG3	0.736				1.184
DG4	0.745				1.383
DG5	0.768				1.188
DG6	0.782				1.168
DG7	0.739				1.220
DG8	0.779				1.247
DG9	0.718				1.256
DG10	0.795				1.208
DG11	0.733				1.258
DG12	0.824				1.198
<i>Governance Quality</i>					
GQ1	0.721	0.524	0.751	0.757	1.256
GQ2	0.734				1.463
GQ3	0.756				1.500
GQ4	0.709				1.469
GQ5	0.758				1.276
GQ6	0.771				1.329
GQ7	0.769				1.290
GQ8	0.754				1.264
GQ9	0.763				1.362
GQ10	0.801				1.244
GQ11	0.814				1.267
GQ12	0.829				1.309
<i>Social Protection Program Effectiveness</i>					
SPPE1	0.781	0.885	0.958	0.717	1.290
SPPE2	0.745				1.277
SPEE3	0.792				1.270
SPEE4	0.758				1.274
SPEE5	0.771				1.316
SPEE6	0.823				1.449
SPEE7	0.719				1.134
SPEE8	0.736				1.238
SPEE9	0.748				1.185
<i>Poverty Reduction</i>					
Percentage of population living below the poverty line	0.764	0.746	0.752	0.532	2.056
Gini ratio	-0.732				2.189
Multidimensional Poverty Index	0.781				2.355
<i>Country</i>					

Indonesia	1.000	1.000	1.000	1.000	1.000
Bangladesh	1.000				1.000

Discriminant validity was evaluated using the Fornell-Larcker criterion and the HTMT ratio (Table 3). The Fornell-Larcker results show that each construct’s square root of AVE (diagonal values) is higher than its correlations with other constructs, indicating adequate discriminant validity (Fornell & Larcker, 1981). Digital Governance and Governance Quality exhibit moderate correlations but remain below their respective AVE square roots, confirming their conceptual distinctiveness. The HTMT ratios further support this conclusion, as all values fall well below the conservative threshold of 0.85 (Henseler et al., 2015), with the highest HTMT value observed between SPPE and PR (0.632). These results confirm that the latent constructs represent empirically distinct dimensions within the model, fulfilling the recommended standards for discriminant validity.

Table 3: Discriminant Validity Assessment.

Fornell-Larcker Criterion				
	DG	GQ	PR	SPPE
DG	0.719			
GQ	0.677	0.569		
PR	0.521	0.422	0.957	
SPPE	0.555	0.405	0.423	0.576
Heterotrait Monotrait Ratio				
DG	0.681			
GQ	0.778	0.691		
PR	0.349	0.261	0.560	
SPPE	0.280	0.405	0.632	0.659

4.3. Inner Model Structural

The structural inner model was assessed using a bootstrapping procedure with 5,000 resamples to evaluate the significance and stability of the estimated path coefficients (Streukens & Leroi-Werelds, 2016). The results demonstrate strong statistical support for all hypothesized direct relationships. As shown in Table 4, Digital Governance positively influences Social Protection Program Effectiveness ( $\beta = 0.394, p < 0.001$ ), with a moderate effect size ( $f^2 = 0.134$ ). Governance Quality shows an even more substantial effect on program effectiveness ( $\beta = 0.496, p < 0.001$ ), accompanied by the largest effect size in the model ( $f^2 = 0.221$ ). Furthermore, Social Protection Program Effectiveness significantly contributes to Poverty Reduction ( $\beta = 0.142, p = 0.004$ ), although with a small effect size ( $f^2 = 0.052$ ). All VIF Inner values fall well below the threshold of 5, indicating no multicollinearity among predictors. Collectively, these findings confirm the robustness and theoretical coherence of the proposed model.

Table 4: Direct Hypothesis Results.

No	Hypothesis	Path Coefficient ( $\beta$ )	Confidence Interval (2.5%-97.5%)	t-value	p-value	Decision	$f^2$	VIF (Inner)
H1	Digital Governance $\rightarrow$ Social Protection Program Effectiveness	0.394	[0.316 - 0.469]	10.154	0.000	Supported	0.134	3.783
H2	Governance Quality $\rightarrow$ Social Protection Program Effectiveness	0.496	[0.425 - 0.570]	13.426	0.000	Supported	0.221	3.645
H3	Social Protection Program Effectiveness $\rightarrow$ Poverty Reduction	0.142	[0.111 - 0.151]	1.993	0.004	Supported	0.052	1.000

The explanatory and predictive power of the structural model was assessed using  $R^2$  and Stone-Geisser  $Q^2$  statistics (Table 5). The model demonstrates substantial explanatory strength, with Digital Governance and Governance Quality jointly accounting for 71.1% of the variance in Social Protection Program Effectiveness, indicating a high level of explained variance. Similarly, Social Protection Program Effectiveness explains 69.4% of the variance in Poverty Reduction, reflecting strong model adequacy for complex socio-governance phenomena. Predictive relevance is further supported by the Q-square values, where Social Protection Program Effectiveness ( $Q^2 = 0.452$ ) exhibits significant predictive relevance, and Poverty Reduction ( $Q^2 = 0.381$ ) demonstrates medium-to-large predictive capability. Both values exceed the recommended threshold of 0.35, confirming that the model possesses meaningful out-of-sample predictive accuracy.

**Table 5: R-Square and Q-Square Results.**

Variable	R-Square	R-Square Adjusted	Q-Square
Social Protection Program Effectiveness	0.711	0.713	0.452
Poverty Reduction	0.694	0.692	0.381

**4.4. Moderation Analysis**

The moderation analysis was conducted to assess whether country context (Indonesia vs. Bangladesh) alters the structural relationships within the model. As shown in Table 6, both interaction terms are statistically significant, indicating meaningful cross-country differences. The interaction between Country and Digital Governance on Social Protection Program Effectiveness is positive and significant ( $\beta = 0.194, p = 0.005$ ), suggesting that the influence of digital governance is more potent in one national context than the other. Similarly, the interaction between Country and Governance Quality on program effectiveness is also significant ( $\beta = 0.162, p = 0.018$ ), reinforcing the presence of contextual moderation. Although the effect sizes ( $f^2 = 0.011$  and  $0.007$ ) fall within the small range, they remain theoretically meaningful in cross-country governance research. Inner VIF values below three further confirm the absence of multicollinearity. Overall, these findings highlight that national context shapes how governance mechanisms translate into social protection performance.

**Table 6: Moderation Analysis Results.**

No	Interaction Path (Code)	Path Coefficient ( $\beta$ )	Confidence Interval (95%)	t-value	p-value	Decision	$f^2$	VIF (Inner)
H4	Country $\times$ Digital Governance $\rightarrow$ SPPE	$\beta = 0.194$	[0.127 - 0.258]	2.815	0.005	Supported	0.011	1.064
H5	Country $\times$ Governance Quality $\rightarrow$ SPPE	$\beta = 0.162$	[0.130 - 0.294]	2.366	0.018	Supported	0.007	2.530

**4.5. MGA Country Analysis**

The multigroup analysis (MGA) was conducted to examine whether the structural relationships differ significantly between Indonesia and Bangladesh (Matthews, 2017). As shown in Table 7, the effects of Digital Governance and Governance Quality on Social Protection Program Effectiveness remain positive and statistically significant in both countries.

However, the path differences for H1 ( $\Delta\beta = 0.065, p = 0.214$ ) and H2 ( $\Delta\beta = 0.051, p = 0.287$ ) are not statistically significant, indicating that the strength of these governance mechanisms operates similarly across national contexts. In contrast, a significant cross-country difference emerges for the relationship between Social Protection Program Effectiveness and Poverty Reduction (H3). The effect is substantially more negative in Indonesia ( $\beta = -0.214, p = 0.009$ ) than in Bangladesh, where the relationship is weak and non-significant ( $\beta = -0.031, p = 0.562$ ). The difference in path coefficients ( $\Delta\beta = 0.183, p = 0.018$ ) confirms a statistically significant divergence. These results suggest that although governance drivers perform comparably, the translation of program effectiveness into poverty-reduction outcomes varies meaningfully across countries.

**Table 7: MGA Country Results.**

Hypothesis	Path	Indonesia ( $\beta, t, p$ )	Bangladesh ( $\beta, t, p$ )	Path Difference ( $\Delta\beta$ )	P-value (MGA)	Decision
H1	Digital Governance $\rightarrow$ SPPE	$\beta = 0.421, t = 8.92, p = 0.000$	$\beta = 0.356, t = 6.74, p = 0.000$	0.065	0.214	Not significant
H2	Governance Quality $\rightarrow$ SPPE	$\beta = 0.518, t = 11.03, p = 0.000$	$\beta = 0.467, t = 9.21, p = 0.000$	0.051	0.287	Not significant
H3	SPPE $\rightarrow$ Poverty Reduction	$\beta = -0.214, t = 2.61, p = 0.009$	$\beta = -0.031, t = 0.03, p = 0.562$	0.183	0.018	Significant difference

**4.6. Importance Performance Mapping Analysis**

The Importance-Performance Map Analysis (IPMA) was employed to complement the PLS-SEM results by integrating the relative importance (total effects) and performance (latent variable scores) of key predictors (Hauff et al., 2024). This approach provides actionable insights for policy prioritization beyond statistical significance. In this study, IPMA was conducted with Social Protection Program Effectiveness as the target construct, given its central role as the primary policy lever. In contrast, Poverty Reduction functions as an outcome variable and is therefore less suitable for managerial prioritization. Focusing IPMA on program effectiveness enables a more practical assessment of which governance dimensions should be strengthened to enhance social protection performance in LMIC contexts.

The analysis of IPMA at the construct level in Figure 2 and Table 8 shows that Governance Quality is more critical (0.496) than Digital Governance (0.394). However, both show almost equal and high performance (73.29 vs 73.11). This means that a

marginal increase in the quality of governance will have a greater impact on the effectiveness of social protection programs than a similar increase in the digital dimension. Since both constructs are already high-performing, practical interventions should focus on strengthening the most influential elements of Governance Quality—e.g., accountability, bureaucratic capacity, and transparency—while investment in Digital Governance is directed towards maintaining and optimizing digital services. The target of increasing Governance Quality performance by 5-10% is expected to provide substantial benefits to SPPE.

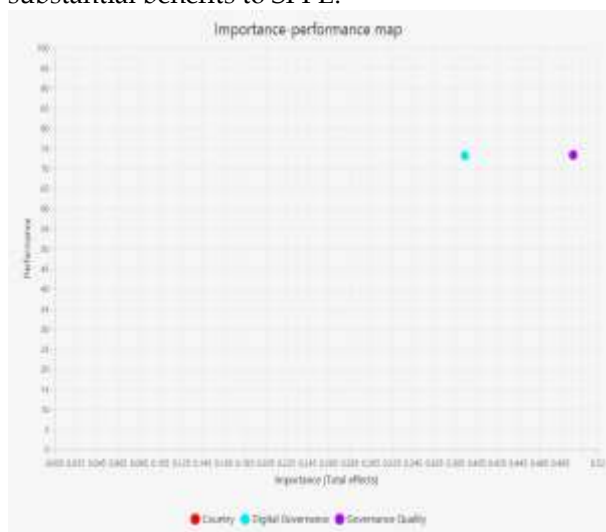


Figure 2: IPMA Matrix- Construct Level.

Table 8: IPMA Results-Construct Level.

Variable	Importance	Performance
Digital Governance	0.394	73.112
Governance Quality	0.496	73.288

Furthermore, the IPMA at the indicator level in Figure 3 shows that several indicators in the Governance Quality construct are most important to program effectiveness, especially GQ12 (policy adaptability), GQ11 (process transparency), and GQ10 (regulatory quality), each with an importance above 0.08. The most influential indicators of Digital Governance are DG12 (digital accessibility for people with low incomes) and DG6/DG8 (system integration and service transparency). However, some indicators of high importance actually exhibit suboptimal performance, such as DG7 (public data transparency) and GQ1/GQ2 (accountability and community participation mechanisms). These findings suggest that increasing program effectiveness will be achieved more quickly by strengthening digital transparency, cross-agency integration, and program regulation and oversight. In practical terms, the IPMA results help governments identify priority interventions to

address the most strategic weak points in digital governance and governance quality.

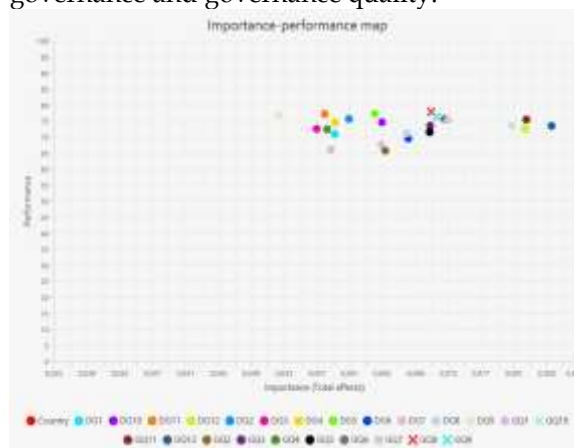


Figure 3: IPMA Matrix- Indicator Level.

#### 4.7. PLS Predict

PLSPredict is used to evaluate the predictive capabilities of the out-of-sample PLS-SEM model, especially whether the structural model can predict indicators in endogenous constructs better than simple benchmarks such as the Linear Model (LM) (Shmueli et al., 2019). Unlike in-sample tests ( $R^2$ ,  $Q^2$ ), PLSPredict assesses model performance in a practical context, whether the model is feasible to use for policy prediction or future program performance estimation.

The results in Table 9 show that all SPP Effectiveness indicators (SPEE1–SPEE9) have positive  $Q^2_{predict}$  values (0.214–0.362), indicating good predictive ability. In addition, most indicators show that the RMSE and MAE of the PLS-SEM model are lower than LM, confirming the model’s predictive superiority. The SPEE6 indicator recorded the best performance ( $Q^2_{predict} = 0.362$ ), indicating strong predictive performance for the efficiency aspect of program distribution. Meanwhile, macro variables such as Gini Ratio, MPI, and Percentage of Population exhibit low predictability, and slight differences between PLS and LM are reasonable given their greater aggregation. Overall, the model has moderate predictive power, especially in constructing program effectiveness.

Table 9: PLSPredict Results.

Indicator	$Q^2_{predict}$	PLS-SEM_RMSE	PLS-SEM_MAE	LM_RMSE	LM_MAE
Gini Ratio	0.042	0.002	0.001	0.003	0.002
MPI	0.058	0.031	0.026	0.036	0.031
Percentage of Population	0.027	4.512	3.962	4.843	4.225
SPEE1	0.331	0.698	0.551	0.716	0.573

SPEE2	0.289	0.722	0.545	0.733	0.569
SPEE3	0.318	0.741	0.587	0.770	0.617
SPEE4	0.301	0.746	0.593	0.754	0.606
SPEE5	0.314	0.729	0.602	0.735	0.607
SPEE6	0.362	0.706	0.571	0.722	0.582
SPEE7	0.214	0.748	0.604	0.763	0.623
SPEE8	0.257	0.703	0.562	0.720	0.580
SPEE9	0.246	0.694	0.558	0.722	0.582

## 4.8. DISCUSSION AND IMPLICATION

### 4.8.1. Discussion

This study elucidates how digital governance and governance quality shape the effectiveness of social protection programs in LMICs. The analysis confirms the hypothesized causal pathway in which stronger digital systems and higher governance quality enhance program effectiveness, ultimately contributing to poverty reduction. Using PLS-SEM, MGA, IPMA, and PLSPredict, the study demonstrates that governance-related constructs operate as key drivers of effective social protection delivery, while also revealing cross-country variations between Indonesia and Bangladesh.

The findings strongly support Hypothesis 1, reaffirming that digital governance plays a foundational role in strengthening the effectiveness of social protection programs in LMICs. This relationship aligns with the broader literature asserting that well-designed digital systems enhance administrative precision, reduce leakage, and improve targeting accuracy in welfare delivery (Crăciun *et al.*, 2023; Vujovic *et al.*, 2024; Asgarkhani & Wan, 2007; Hien *et al.*, 2024; Gualavisí, 2024; Onyango & Ondiek, 2023). In the context of Indonesia and Bangladesh, digital governance functions not merely as a technological upgrade but as an institutional enabler that restructures how states identify beneficiaries, coordinate inter-agency data, and deliver assistance at scale. The positive effect observed indicates that digital infrastructure, interoperability, transparency tools, and user-friendly service platforms collectively contribute to more timely, accountable, and responsive program implementation. Moreover, this result underscores that digital governance is not a neutral technical layer; it actively shapes state capacity by embedding standardized processes and reducing discretionary room for errors or manipulation. Consequently, investing in robust digital ecosystems represents a strategic pathway for LMIC governments seeking to enhance social protection performance and reinforce public trust in welfare administration.

Support for Hypothesis 2 underscores the centrality of governance quality as a determinant of the effectiveness of social protection programs in

LMIC contexts. Beyond administrative procedures, high-quality governance reflects the extent to which institutions uphold accountability, regulatory clarity, bureaucratic professionalism, and corruption control—factors that directly shape the fidelity of implementation. The strong influence observed indicates that even with digital tools in place, social protection systems require capable institutions to interpret data accurately, enforce rules consistently, and ensure equitable service delivery. This finding aligns with governance scholarship emphasizing that institutional strength amplifies the benefits of technological reforms by reducing coordination failures and reinforcing compliance across administrative layers (Liashenko *et al.*, 2024; Vinci & Roelen, 2020; Gunhidzirai & Rankopo, 2025; Ben Mimoun & Raies, 2022; Bisogno *et al.*, 2025). In Indonesia and Bangladesh, variations in bureaucratic capacity, policy coherence, and oversight mechanisms likely explain differences in program performance, illustrating that governance quality remains a prerequisite for translating policy intentions into tangible outcomes. Thus, improving governance quality remains a strategic priority for LMICs aiming to scale effective social protection systems and ensure that vulnerable populations receive benefits as intended.

The confirmation of Hypothesis 3 demonstrates that effective social protection programs contribute meaningfully to poverty reduction, although the magnitude of this influence remains modest. This aligns with global evidence suggesting that while well-targeted and efficiently delivered social protection initiatives can mitigate vulnerability (J. Singh *et al.*, 2025; Wu & Ramesh, 2014; Jensen *et al.*, 2017; Khosla & Jena, 2022; Komba & Kitole, 2025). The direct impact on structural poverty is often incremental, especially in LMIC contexts where labor markets, price shocks, and regional disparities remain strong determinants of household welfare. The modest effect size suggests that social protection programs primarily serve as short- to medium-term stabilizers rather than as transformative economic levers.

Crucially, the MGA results reveal a significant cross-country difference in this pathway. In Indonesia, the negative and meaningful coefficient suggests that more effective programs are associated with clearer improvements in poverty indicators, reflecting relatively mature digital delivery systems, stronger administrative capacity, and better integration across welfare schemes. Conversely, the relationship is weak and statistically insignificant in Bangladesh, indicating that program effectiveness

does not translate into measurable poverty reduction to the same extent. This divergence underscores the importance of national governance contexts, implementation quality, and policy coherence in shaping welfare outcomes. It also suggests that social protection alone cannot offset structural deprivation without complementary reforms in employment, education, and market access.

The significant moderating effects found in H4 and H5 highlight that national context meaningfully shapes the extent to which digital governance and governance quality enhance the effectiveness of social protection programs. The positive interaction in H4 indicates that digital governance has a more substantial influence on SPPE in Indonesia than in Bangladesh, suggesting that digital infrastructures, interoperability, and e-government maturity amplify program outcomes only when foundational systems are sufficiently developed. Indonesia's more advanced digital public administration, such as integrated beneficiary databases, digital ID coverage, and established payment platforms, likely strengthens the translation of digital governance improvements into program performance.

Similarly, the moderation effect in H5 shows that governance quality contributes more strongly to SPPE within Indonesia's administrative environment. This underscores how accountability mechanisms, bureaucratic capacity, and regulatory coherence enhance implementation effectiveness in ways not fully mirrored in Bangladesh. While both countries invest in governance reforms, variations in institutional stability, decentralization arrangements, and anti-corruption controls may explain the differing degrees of influence. Together, these findings demonstrate that digital and administrative reforms do not operate uniformly across LMICs; instead, their effectiveness depends on broader state capacity and institutional maturity. This reinforces the need for context-sensitive strategies, where technological interventions and governance improvements are sequenced and adapted to each country's institutional readiness.

#### **4.9. Theoretical Implications**

This study offers several theoretical contributions to the growing literature on digital governance, institutional quality, and social protection outcomes in LMICs. First, the findings demonstrate that digital governance is not merely a technical enhancement but a core component of state capacity, extending theories that position digital infrastructures as enablers of administrative coherence and procedural standardization. The results show that digitalization

strengthens implementation effectiveness through mechanisms such as data interoperability, transparency, and reduced discretionary errors, advancing conceptual debates on the institutional embeddedness of digital reforms. Second, the strong influence of governance quality underscores that digital systems alone are insufficient without complementary institutional conditions. This reinforces governance theory perspectives that emphasize the co-evolution of technology and bureaucratic capability, suggesting that institutional maturity amplifies the returns of digital investments. Third, the study provides empirical insight into how social protection effectiveness mediates the relationship between governance mechanisms and poverty outcomes, offering a more nuanced theoretical model of welfare delivery in LMICs where program performance, rather than policy design alone, determines poverty reduction trajectories. Finally, the significant cross-country moderation effects contribute to comparative public administration theory by illustrating that governance reforms are context-contingent. This highlights the need for theories that account for institutional heterogeneity across LMICs, moving beyond universalist assumptions toward more context-sensitive models of digital and administrative governance.

#### **4.10. Practical-Policy Implications**

The findings deliver several important managerial and policy implications for governments in LMICs seeking to strengthen the performance of social protection systems. First, the strong influence of digital governance on program effectiveness suggests that investments in digital infrastructure must move beyond hardware provision toward end-to-end digitalization of delivery chains. This includes interoperable beneficiary registries, secure digital ID systems, integrated payment platforms, and real-time monitoring dashboards. For policymakers, this implies prioritizing cross-ministerial data governance frameworks that reduce duplication, ensure data accuracy, and enable rapid verification during shocks or crises, particularly relevant in contexts vulnerable to pandemics, climate events, or market disruptions.

Second, the dominant role of governance quality indicates that technological progress alone cannot compensate for weak institutions. Strengthening accountability mechanisms, enhancing bureaucratic capacity, and ensuring regulatory coherence are essential prerequisites for effective program delivery. Governments should therefore invest in civil service

training, audit and oversight mechanisms, anti-fraud systems, and participatory feedback channels that empower citizens to report inconsistencies. These governance improvements are especially critical in decentralized systems such as Indonesia and Bangladesh, where implementation gaps at the local level often undermine national policy objectives.

Third, cross-country differences highlight that reforms must be sequenced according to institutional readiness. In Indonesia, where digital and governance infrastructures are relatively mature, the focus should shift to optimization, improving targeting algorithms, reducing inclusion-exclusion errors, and ensuring last-mile digital accessibility for rural and marginalized populations. Indonesia's stronger translation of program effectiveness into poverty outcomes suggests that digital and administrative reforms are most impactful when embedded within mature institutional environments. In Bangladesh, foundational investments should be prioritized, such as strengthening data integration and addressing governance bottlenecks before scaling more advanced digital tools. Sequencing reforms, starting with governance strengthening before large-scale digital rollout, may yield better results. Policymakers should therefore avoid "copy-paste" digital reforms and instead align interventions with existing state capacity, political incentives, and local administrative realities.

Finally, insights from IPMA and PLSPredict provide a roadmap for prioritizing reform areas. High-importance yet lower-performance indicators—such as transparency mechanisms (DG7), accountability systems (GQ1), and citizen participation (GQ2)—represent strategic entry points where marginal improvements can produce substantial gains in program effectiveness. Strengthening these areas not only enhances service delivery but also builds public trust, an essential factor for sustainable welfare system reform in LMICs.

## 5. CONCLUSION

This study examined how digital governance and

governance quality jointly shape the effectiveness of social protection programs and their subsequent impact on poverty reduction in two major LMICs—Indonesia and Bangladesh. The findings demonstrate that both digital governance and governance quality are essential determinants of program effectiveness, highlighting that technological systems and institutional capacity must operate in tandem to ensure equitable, transparent, and efficient welfare delivery. Effective social protection programs were shown to contribute to poverty reduction, although the magnitude of this effect varied substantially across countries. Indonesia exhibited a stronger and significant pathway between program effectiveness and poverty outcomes. In contrast, in Bangladesh the relationship remained weak, underscoring the crucial role of institutional maturity, administrative coherence, and digital readiness in translating welfare system performance into measurable socio-economic improvements. The moderating effects of country context further confirm that governance reforms do not yield uniform benefits across LMICs, reinforcing the need for context-sensitive policy design.

Despite its contributions, this study has several limitations. Its cross-sectional design constrains causal inference and cannot capture temporal changes in governance or program delivery. Reliance on self-reported beneficiary data may introduce perceptual bias, despite methodological safeguards. The comparison is limited to two LMICs, which, while analytically informative, may not represent broader regional contexts. In addition, the poverty reduction measure partly relies on macro indicators influenced by wider economic dynamics beyond social protection. Future research should employ longitudinal or panel data to examine the dynamic effects of digital and governance reforms. Expanding comparisons across multiple LMIC regions would improve generalizability. Integrating qualitative methods, such as process tracing or administrative ethnography, would clarify implementation dynamics, while further work on algorithmic governance, data ethics, and digital inclusion is essential as digital tools expand in LMIC social protection systems.

**Author Contributions:** Conceptualization, Suci Megawati and Wiwik Sri Utami; methodology, Suci Megawati; software, Muhammad Alfarizi; validation, Suci Megawati, Wiwik Sri Utami, and Jauhar Wahyuni; formal analysis, Suci Megawati; investigation, Suci Megawati and Wiwik Sri Utami; resources, Kuntala Chowdhury; data curation, Jauhar Wahyuni; writing—original draft preparation, Suci Megawati; writing—review and editing, Wiwik Sri Utami, Kuntala Chowdhury, and Muhammad Alfarizi; visualization, Muhammad Alfarizi; supervision, Wiwik Sri Utami; project administration, Suci Megawati, Kuntala Chowdhury; funding acquisition, Suci Megawati.

**Acknowledgements:** This research is funded by the Indonesian Endowment Fund for Education (LPDP) on behalf of the Indonesian Ministry of Higher Education, Science and Technology and managed under the EQUITYProgram (Contract No. B/152183/UN38.III.1/LK.04.00/2025).

## REFERENCES

- Agnafors, M. (2013). Quality of government: Toward a more complex definition. *American Political Science Review*, 107(3), 433–444. <https://doi.org/10.1017/S0003055413000191>
- Aisyah, S., Hidayah, Z., Juniadi, D., Purnomo, E. P., Wibowo, A. M., & Harta, R. (2024). Transforming Smart City Governance for Quality of Life and Sustainable Development in Semarang City, Indonesia. *International Journal of Sustainable Development and Planning*, 19(9), 3443–3452. <https://doi.org/10.18280/ijstdp.190914>
- Alsaad, A., Alkhawaldeh, A., Elrehail, H., & Almomani, R. (2024). Linking e-government development and quality of governance to trust in government: evidence from OECD member countries. *Transforming Government: People, Process and Policy*, 18(4), 575–593. <https://doi.org/10.1108/TG-03-2024-0060>
- Alvesson, M., Hallett, T., & Spicer, A. (2019). Uninhibited Institutionalisms. *Journal of Management Inquiry*, 28(2), 119–127. <https://doi.org/10.1177/1056492618822777;WEBSITE:WEBSITE:SAGE;ISSUE:ISSUE:DOI>
- Anggono, B. D., Wahanisa, R., Aulia Oktarizka Vivi Puspita Sari, A. P., & Adiyatma, S. E. (2025). Interrogating the Legal Foundations of Digital Transformation: Balancing Economic Growth and Social Welfare in the Era of Disruption. *Volksgeist: Jurnal Ilmu Hukum Dan Konstitusi*, 8(1), 191–211. <https://doi.org/10.24090/volksgeist.v8i1.12211>
- Asgarkhani, M., & Wan, J. (2007). Key attributes for success within the ICT job market: A case study of ICT students' view. *Proceedings of the 20th Conference of the National Advisory Committee on Computing Qualifications*, 11–14.
- Banks, L. M., Mearkle, R., Mactaggart, I., Walsham, M., Kuper, H., & Blanchet, K. (2017). Disability and social protection programmes in low- and middle-income countries: a systematic review. *Oxford Development Studies*, 45(3), 223–239. <https://doi.org/10.1080/13600818.2016.1142960>
- Barbier, E. B., & Burgess, J. C. (2021). Institutional quality, governance and progress towards the SDGs. *Sustainability (Switzerland)*, 13(21). <https://doi.org/10.3390/su132111798>
- Barreix Sibils, G., Brachowicz, N., Silva, N. J., Landin, E., Macicame, I., Naidoo, M., de Sampaio Morais, G., & Rasella, D. (2024a). The mitigating effect of social protection on undernourishment during economic downturns: A longitudinal study of 46 low- and middle-income countries over the last two decades. *Social Science and Medicine*, 361. <https://doi.org/10.1016/j.socscimed.2024.117365>
- Barreix Sibils, G., Brachowicz, N., Silva, N. J., Landin, E., Macicame, I., Naidoo, M., de Sampaio Morais, G., & Rasella, D. (2024b). The mitigating effect of social protection on undernourishment during economic downturns: A longitudinal study of 46 low- and middle-income countries over the last two decades. *Social Science & Medicine*, 361, 117365. <https://doi.org/10.1016/J.SOCSCIMED.2024.117365>
- Barrientos, A. (2010). Protecting Capability, Eradicating Extreme Poverty: Chile Solidario and the Future of Social Protection. *Journal of Human Development and Capabilities*, 11(4), 579–597. <https://doi.org/10.1080/19452829.2010.520926>
- Ben Mimoun, M., & Raies, A. (2022). Is social spending pro-poor in developing countries? The role of governance and political freedom. *Poverty and Public Policy*, 14(3), 214–241. <https://doi.org/10.1002/pop4.347>
- Berbecaru, D. G., Liroy, A., & Cameroni, C. (2020). Providing Login and Wi-Fi Access Services with the eIDAS Network: A Practical Approach. *IEEE Access*, 8, 126186–126200. <https://doi.org/10.1109/ACCESS.2020.3007998>
- Bhutta, A. I., Ullah, M. R., Sultan, J., Riaz, A., & Sheikh, M. F. (2022). Impact of Green Energy Production, Green Innovation, Financial Development on Environment Quality: A Role of Country Governance in Pakistan. *International Journal of Energy Economics and Policy*, 12(1), 316–326. <https://doi.org/10.32479/ijeeep.11986>
- Bilan, Y., Yurchyk, H., Samoliuk, N., & Mishchuk, H. (2025). Evaluating the effectiveness of public finance used for social protection of internally displaced persons. *Public and Municipal Finance*, 14(1), 23–40. [https://doi.org/10.21511/pmf.14\(1\).2025.03](https://doi.org/10.21511/pmf.14(1).2025.03)
- Bisogno, M., Cuadrado Ballesteros, B., Manes Rossi, F., & Peña Miguel, N. (2025). Governance quality and the

- sustainable development goals: an assessment in Europe. *Journal of Public Budgeting, Accounting and Financial Management*, 37(6), 193–219. <https://doi.org/10.1108/JPBAFM-01-2025-0018>
- Brown, L., El-Hoss, T., & Gearon, A. (2025). The development of child protection systems and practice in low-to middle-income countries. In *The Development of Child Protection Systems and Practice in Low- to Middle-Income Countries*. Policy Press. <https://doi.org/10.2307/jj.12348195>
- Bugaychuk, V., Grabchuk, I., Haiduchok, T., Malyuga, N., & Rusak, O. (2024). The development of digitalisation of the social sphere in Ukraine: Theoretical discourse. In *Studies in Systems, Decision and Control* (Vol. 525, pp. 521–532). Springer Science and Business Media Deutschland GmbH. [https://doi.org/10.1007/978-3-031-54383-8\\_40](https://doi.org/10.1007/978-3-031-54383-8_40)
- Carraro, L., & Marzi, M. S. L. (2021). Effects of social protection on poverty and inequality. In *Handbook on Social Protection Systems* (pp. 582–595). Edward Elgar Publishing Ltd. <https://www.scopus.com/inward/record.uri?eid=2-s2.0-85121465549&partnerID=40&md5=1e4f18a9333eb88ec8f44a33aab52c52>
- Chen, N. (2024a). Income insecurity and social protection: Examining the impact of the COVID-19 pandemic across income groups. *PLoS ONE*, 19(9). <https://doi.org/10.1371/journal.pone.0310680>
- Chen, N. (2024b). Income insecurity and social protection: Examining the impact of the COVID-19 pandemic across income groups. *PLOS ONE*, 19(9). <https://doi.org/10.1371/journal.pone.0310680>
- Costella, C., Banthiya, A., Reilly, R., Sivanu, S., Slater, R., Georgiadou, Y., & Van Aalst, M. (2024). Mapping the integration of climate considerations in social protection in LMICs: An assessment of ninety-eight climate-relevant social protection programs. *Climate Risk Management*, 46. <https://doi.org/10.1016/j.crm.2024.100660>
- Crăciun, A.-F., Țăran, A.-M., Noja, G. G., Pirtea, M. G., & Răcățăian, R.-I. (2023). Advanced Modelling of the Interplay between Public Governance and Digital Transformation: New Empirical Evidence from Structural Equation Modelling and Gaussian and Mixed-Markov Graphical Models. *Mathematics*, 11(5). <https://doi.org/10.3390/math11051168>
- Das, S. (2025). Bridging Digital Divide: A Study on the UMANG Platform and Its Impact on E-Governance. In Y. X.-S., R. S. Sherratt, N. Dey, & A. Joshi (Eds.), *Lecture Notes in Networks and Systems: Vol. 1442 LNNS* (pp. 337–344). Springer Science and Business Media Deutschland GmbH. [https://doi.org/10.1007/978-981-96-6929-5\\_27](https://doi.org/10.1007/978-981-96-6929-5_27)
- Dobrolyubova, E. I. (2020). In reference to the correlation between governance quality and human development. *Public Administration Issues*, 4, 31–58. <https://www.scopus.com/inward/record.uri?eid=2-s2.0-85103119970&partnerID=40&md5=1870a227d32ef0f6d0d5b12458132ff5>
- Dobrolyubova, E. I., & Yuzhakov, V. N. (2021). Diagnostics of Public Governance Quality in Russia. *Ekonomicheskaya Politika*, 4, 170–197. <https://doi.org/10.18288/1994-5124-2021-4-170-197>
- Dwivedi, Y. K., Sahu, G. P., Rana, N. P., Singh, M., & Chandwani, R. K. (2016). Common Services Centres (CSCs) as an approach to bridge the digital divide Reflecting on challenges and obstacles. *Transforming Government: People, Process and Policy*, 10(4), 511–525. <https://doi.org/10.1108/TG-01-2016-0006>
- Evans, O. (2023). ICT and the provision of social services in low-income countries: the moderating role of institutional quality. *Journal of Enterprising Communities*, 17(4), 875–899. <https://doi.org/10.1108/JEC-07-2021-0094>
- Fahrudin, A., Andayani, R. H. R., Albert, W. K. G., Hindarsah, I., Hakim, M. Z., & Yusuf, H. (2024). The Impact of Social Protection on Community Resilience in the Context of Climate Change and Natural Disaster. *Journal of Ecohumanism*, 3(8), 1424–1431. <https://doi.org/10.62754/joe.v3i8.4824>
- Fang, Q., Yu, N., & Xu, H. (2023). Governance effects of digital transformation: from the perspective of accounting quality. *China Journal of Accounting Studies*, 11(1), 77–107. <https://doi.org/10.1080/21697213.2023.2148944>
- Faozanudin, M., Sulistiani, L. S., Rosyadi, S., Nuraini, H., Rohman, A., Gunarto, G., & Wahyuningrat. (2025). Digital Transformation Readiness Among Village Government Officials: A Public Service Innovation Study in Banyumas Regency, Indonesia. *Pakistan Journal of Life & Social Sciences*, 23(1), 3027. <https://doi.org/10.57239/PJLSS-2025-23.1.00240>
- Fornell, C., & Larcker, D. F. (1981). Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. *Journal of Marketing Research*, 18(1), 39–50. <https://doi.org/10.1177/002224378101800104>
- G. C. S. B., Gurung, S. K., Jung Bahadur Rana, S. B., & Dhungana, B. R. (2024). e-Governance, citizen satisfaction

- and net benefits: the moderating effect of digital divide. *Cogent Business and Management*, 11(1). <https://doi.org/10.1080/23311975.2024.2402512>
- Garcia-Sanchez, I. M., Cuadrado-Ballesteros, B., & Frias-Aceituno, J. (2013). Determinants of Government Effectiveness. *International Journal of Public Administration*, 36(8), 567–577. <https://doi.org/10.1080/01900692.2013.772630;CTYPE:STRING:JOURNAL>
- Gnangnon, S. K. (2020). Impact of export product concentration on social protection expenditure Does trade openness matter? *Journal of Economic Studies*, 47(3), 649–669. <https://doi.org/10.1108/JES-02-2019-0084>
- Gualavisi, A. B. (2024). Digital Welfare State in Ecuador: Citizen Datafication and Machine Learning in the Construction and Management of Poverty. *CUHSO (Temuco)*, 34(1), 103–138. <https://doi.org/10.7770/CUHSO-V34N1-ART644>
- Gunhidzirai, C., & Rankopo, M. J. (2025). Governance of Social Protection Programmes for Poverty Alleviation in Botswana. *Journal of Social Development in Africa*, 40(1), 137–169. <https://doi.org/10.4314/jsda.v40i1.7>
- Habibov, N. N., & Fan, L. (2006). Social assistance and the challenges of poverty and inequality in Azerbaijan, a low-income country in transition. *Journal of Sociology and Social Welfare*, 33(1), 203–226. <https://www.scopus.com/inward/record.uri?eid=2-s2.0-33645766812&partnerID=40&md5=1d8b9c9e3f964947e553d8076bbc43a8>
- Hair, J. F., Matthews, L., Matthews, R. L., & Sarstedt, M. (2017). PLS-SEM or CB-SEM: updated guidelines on which method to use. *International Journal of Multivariate Data Analysis*, 1(2), 107–123. <https://doi.org/10.1504/IJMDA.2017.087624>
- Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review*, 31(1), 2–24. <https://doi.org/10.1108/EBR-11-2018-0203>
- Hair, J., Hollingsworth, C. L., Randolph, A. B., & Chong, A. Y. L. (2017). An updated and expanded assessment of PLS-SEM in information systems research. *Industrial Management & Data Systems*, 117(3), 442–458. <https://doi.org/10.1108/IMDS-04-2016-0130>
- Hamid, B., Jhanjhi, N. Z., & Humayun, M. (2019). Digital governance for developing countries opportunities, Issues, and Challenges in Pakistan. In *Employing Recent Technologies for Improved Digital Governance* (pp. 36–58). IGI Global. <https://doi.org/10.4018/978-1-7998-1851-9.ch003>
- Hanisch, M., Goldsby, C. M., Fabian, N. E., & Oehmichen, J. (2023). Digital governance: A conceptual framework and research agenda. *Journal of Business Research*, 162. <https://doi.org/10.1016/j.jbusres.2023.113777>
- Harris, E. (2013). Financing social protection floors: Considerations of fiscal space. *International Social Security Review*, 66(3–4), 111–143. <https://doi.org/10.1111/issr.12021>
- Hauff, S., Richter, N. F., Sarstedt, M., & Ringle, C. M. (2024). Importance and performance in PLS-SEM and NCA: Introducing the combined importance-performance map analysis (cIPMA). *Journal of Retailing and Consumer Services*, 78. <https://doi.org/10.1016/j.jretconser.2024.103723>
- Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, 43(1), 115–135. <https://doi.org/10.1007/s11747-014-0403-8>
- Hien, B. N., Tuyen, N. T. K., Lan, N. T., Ngan, N. T. K., & Thanh, N. N. (2024). The Impact of Digital Government Initiatives on Public Value Creation: Evidence from Ho Chi Minh City -Vietnam. *Revista de Gestão Social e Ambiental*, 18(2), e04892. <https://doi.org/10.24857/rgsa.v18n2-092>
- Hilowle, M., Yeoh, W., Grobler, M., Pye, G., & Jiang, F. (2024). Improving National Digital Identity Systems Usage: Human-Centric Cybersecurity Survey. *Journal of Computer Information Systems*, 64(6), 820–834. <https://doi.org/10.1080/08874417.2023.2251452>
- Holeman, I., Cookson, T. P., & Pagliari, C. (2016). Digital technology for health sector governance in low and middle income countries: a scoping review. *Journal of Global Health*, 6(2). <https://doi.org/10.7189/JOGH.06.020408>
- Howard, M. C., Boudreaux, M., & Oglesby, M. (2024). Can Harman’s single-factor test reliably distinguish between research designs? Not in published management studies. *European Journal of Work and Organizational Psychology*, 33(6), 790–804. <https://doi.org/10.1080/1359432X.2024.2393462;REQUESTEDJOURNAL:JOURNAL:PEWO20;WGR OUP:STRING:PUBLICATION>

- Humphrey, J. (2006). Prospects and challenges for growth and poverty reduction in Asia. *Development Policy Review*, 24(SUPPL. 1), s29-49. <https://doi.org/10.1111/j.1467-7679.2006.00340.x>
- Hypher, N., & Richards, K. (2015). Lessons from practice in child-sensitive social protection. *Enterprise Development and Microfinance*, 26(2), 122-138. <https://doi.org/10.3362/2046-1887.2015.013>
- Inusah, S., Ibrahim Osman, A., & Narsam, S. Z. (2024). Mobile infrastructure quality, regulatory quality, government effectiveness: Does e-government development matter? *Electronic Journal of Information Systems in Developing Countries*, 90(6). <https://doi.org/10.1002/isd2.12330>
- Janzen, S. A., Jensen, N. D., & Mude, A. G. (2016). Targeted social protection in a pastoralist economy: Case study from Kenya. *OIE Revue Scientifique et Technique*, 35(2), 587-596. <https://doi.org/10.20506/rst.35.2.2543>
- Jensen, N., Ikegami, M., & Mude, A. (2017). Integrating Social Protection Strategies for Improved Impact: A Comparative Evaluation of Cash Transfers and Index Insurance in Kenya. *Geneva Papers on Risk and Insurance: Issues and Practice*, 42(4), 675-707. <https://doi.org/10.1057/s41288-017-0060-5>
- Jezova, D. (2024). European Union E-Governance: E-Governance Tools for the Correct Implementation of Digital Single Market. In *Contributions to Political Science: Vol. Part F3080* (pp. 135-147). [https://doi.org/10.1007/978-3-031-56045-3\\_10](https://doi.org/10.1007/978-3-031-56045-3_10)
- Jia, S.-H., Zhang, T., & Wang, Y.-M. (2006). Government online service quality and customer satisfaction: An investigation of three Chinese governmental portal websites. *Proceedings - ICSSSM'06: 2006 International Conference on Service Systems and Service Management*, 2, 1277-1279. <https://doi.org/10.1109/ICSSSM.2006.320692>
- Kasimatis, D., Buchanan, W. J., Abubakar, M., Lo, O., Chrysoulas, C., Pitropakis, N., Papadopoulos, P., Sayeed, S., & Sel, M. (2024). Transforming EU Governance: The Digital Integration Through EBSI and GLASS. In N. Pitropakis, S. Katsikas, S. Furnell, & K. Markantonakis (Eds.), *IFIP Advances in Information and Communication Technology* (Vol. 710, pp. 250-263). Springer Science and Business Media Deutschland GmbH. [https://doi.org/10.1007/978-3-031-65175-5\\_18](https://doi.org/10.1007/978-3-031-65175-5_18)
- Khosla, S., & Jena, P. R. (2022). Analyzing vulnerability to poverty and assessing the role of universal public works and food security programs to reduce it: Evidence from an eastern Indian state. *Review of Development Economics*, 26(4), 2296-2316. <https://doi.org/10.1111/rode.12928>
- Kirton, J., & Warren, B. (2021). From Silos to Synergies: G20 Governance of the SDGs, Climate Change & Digitalization2. *International Organisations Research Journal*, 16(2), 1-38. <https://doi.org/10.17323/1996-7845-2021-02-03>
- Komba, C., & Kitole, F. A. (2025). Impact of community-driven development programs on poverty reduction: evidence from Tanzania's Social Action Fund (TASAF) in Babati District, Tanzania. *Discover Global Society*, 3(1). <https://doi.org/10.1007/s44282-025-00220-6>
- Kordić, L., Mrnjavac, Ž., Šimundić, B., & Bejaković, P. (2019). Quality of Government - Scandinavia vs. South East Europe. In *Investigating Spatial Inequalities: Mobility, Housing and Employment in Scandinavia and South-East Europe* (pp. 89-105). Emerald Group Publishing Ltd. <https://doi.org/10.1108/978-1-78973-941-120191006>
- Kouadio, M. (2025). Effects of governance quality on health outcomes in West African countries. *Discover Public Health*, 22(1). <https://doi.org/10.1186/s12982-025-01014-6>
- Li, H. (2024). Smart Practice of Integrating Administrative Management and Human Resources of Chinese Local Governments under the Background of Digital Transformation. *Lex Localis*, 22(3), 209-227. [https://doi.org/10.52152/22.3.209-227\(2024\)](https://doi.org/10.52152/22.3.209-227(2024))
- Li, W., Zhang, J., Guo, X., Zhou, Y., Yang, F., & Li, R. (2024). Digitally Driven Urban Governance: Framework and Evaluation in China. *Sustainability*, 16(22), 9673. <https://doi.org/10.3390/su16229673>
- Li, Y., & Shang, H. (2020). Service quality, perceived value, and citizens' continuous-use intention regarding e-government: Empirical evidence from China. *Information and Management*, 57(3). <https://doi.org/10.1016/j.im.2019.103197>
- Li, Z., Zhou, X., Ran, S., & Wehrmeister, F. C. (2021). Social protection and the level and inequality of child mortality in 101 low- and middle-income countries: A statistical modelling analysis. *Journal of Global Health*, 11, 1-11. <https://doi.org/10.7189/jogh.11.04067>
- Liashenko, O., Mykhailovska, O., Shestakovska, T., & Selyutin, S. (2024). Effectiveness of governance vs social development: a multivariate approach to countries' classification. *Administratie Si Management Public*, 2024(42), 6-24. <https://doi.org/10.24818/amp/2023.42-01>

- Lockwood, M. (2010). Good governance for terrestrial protected areas: A framework, principles and performance outcomes. *Journal of Environmental Management*, 91(3), 754–766. <https://doi.org/10.1016/j.jenvman.2009.10.005>
- Luo, T., Liu, H., Shi, X., Meng, P., Wang, J., & Fang, W. (2024). An Empirical Study of the Quality Governance Level of China's Civil Aircraft Industry. *Systems*, 12(7). <https://doi.org/10.3390/systems12070247>
- Ma, Y., Ma, B., Yu, L., Ma, M., & Dong, Y. (2024). Perceived social fairness and trust in government serially mediate the effect of governance quality on subjective well-being. *Scientific Reports*, 14(1). <https://doi.org/10.1038/s41598-024-67124-4>
- Maheshwari, N., Mohan, G., & Mishra, D. (2025). Digital transformation in governance: Preconditions for achieving good governance. *Public Policy and Administration*. <https://doi.org/10.1177/09520767251355715>
- Matthews, L. (2017). Applying multigroup analysis in PLS-SEM: A step-by-step process. In *Partial Least Squares Path Modeling: Basic Concepts, Methodological Issues and Applications* (pp. 219–243). [https://doi.org/10.1007/978-3-319-64069-3\\_10](https://doi.org/10.1007/978-3-319-64069-3_10)
- Megawati, S., & Mahdiannur, M. A. (2021, December). Implementation of Forest Conservation Policies based on Local Wisdom of the Ammatoa Kajang Indigenous Community. In *IOP Conference Series: Earth and Environmental Science* (Vol. 940, No. 1, p. 012082). IOP Publishing. DOI 10.1088/1755-1315/940/1/012082
- Menéndez González, I. (2021). Insiders, Outsiders, Skills, and Preferences for Social Protection: Evidence From a Survey Experiment in Argentina. *Comparative Political Studies*, 54(14), 2581–2610. <https://doi.org/10.1177/00104140211024304>
- Misra, H., & Panigrahi, S. K. (2014). Transforming rural e-governance for citizen collaboration in India: Is digital-learning an answer? *ACM International Conference Proceeding Series*, 2014–November, 79–83. <https://doi.org/10.1145/2729104.2729119>
- Misuraca, G., Lipparini, F., & Pasi, G. (2021). Towards Smart Governance: Insights from Assessing ICT-Enabled Social Innovation in Europe. In *Public Administration and Information Technology* (Vol. 37, pp. 217–238). Springer. [https://doi.org/10.1007/978-3-030-61033-3\\_10](https://doi.org/10.1007/978-3-030-61033-3_10)
- Musa, K., Janssen, M., Said, J., Zakaria, N. B., & Erum, N. (2024). The Impact of Public Debt and Quality of Governance on Economic Growth in High-Income Countries. *Journal of the Knowledge Economy*. <https://doi.org/10.1007/s13132-024-02073-x>
- Nguyen, P., Considine, M., Putra, F., & Sanusi, A. (2025). Digital welfare-to-work in the global south: A case of Indonesian pre-employment card program. *Australian Journal of Social Issues*, 60(2), 473–489. <https://doi.org/10.1002/ajs4.362>
- Nimer, K., Uyar, A., Kuzey, C., & Schneider, F. (2022). E-government, education quality, internet access in schools, and tax evasion. *Cogent Economics and Finance*, 10(1). <https://doi.org/10.1080/23322039.2022.2044587>
- Onyango, G., & Ondiek, J. O. (2023). Digitalising analogue policy targets! 'Digital capabilities' of older persons and policy digitalisation of social safety net programs in a developing country context. *Journal of Technology in Human Services*, 41(4), 348–375. <https://doi.org/10.1080/15228835.2023.2263494>
- Owusu-Addo, E. (2016). Perceived impact of Ghana's conditional cash transfer on child health. *Health Promotion International*, 31(1), 33–43. <https://doi.org/10.1093/heapro/dau069>
- Oyedeko, Y. O., Ali-Momoh, B. O., Owoniya, B. O., & Gbadebo, A. T. (2025). Digital economy and sustainability in Africa: Does governance quality matter? In *Multi-Industry Digitalization and Technological Governance in the AI Era* (pp. 149–177). IGI Global. <https://doi.org/10.4018/979-8-3373-1681-9.ch008>
- Patel, L. (2018). Social protection in africa: Beyond safety nets? *Journal of Sociology and Social Welfare*, 45(4), 79–103. <https://doi.org/10.15453/0191-5096.4244>
- Patel, L., Plagerson, S., & Chinyoka, I. (2023). *Handbook on social protection and social development in the global South*. Edward Elgar Publishing Ltd. <https://doi.org/10.4337/9781800378421>
- Peerenboom, R. (2012). Law and development in middle-income countries: Introduction. In *Law and Development of Middle-Income Countries: Avoiding the Middle-Income Trap* (pp. 1–18). Cambridge University Press. <https://doi.org/10.1017/CBO9781139235730.001>
- Pega, F., Pabayo, R., Benny, C., Lee, E.-Y., Lhachimi, S. K., & Liu, S. Y. (2022). Unconditional cash transfers for reducing poverty and vulnerabilities: effect on use of health services and health outcomes in low- and middle-income countries. *Cochrane Database of Systematic Reviews*, 2022(3).

- <https://doi.org/10.1002/14651858.CD011135.pub3>
- Purba, J. D., & Nugroho, F. (2025). The Digitalization of Social Protection: Implementing the Family Hope Program to Improve Social Services in Bogor Regency. *Asian Journal of Management, Entrepreneurship and Social Science*, 5(02), 1109–1127. <https://doi.org/10.63922/AJMESC.V5I02.1359>
- Rahman, M., Rana, M. S., Rahman, M. M., & Khan, M. N. (2025a). Exploring access to social protection by persons with disabilities in Bangladesh. *PLOS ONE*, 20(4), e0321887. <https://doi.org/10.1371/JOURNAL.PONE.0321887>
- Rahman, M., Rana, Md. S., Rahman, Md. M., & Khan, Md. N. (2025b). Exploring access to social protection by persons with disabilities in Bangladesh. *PLOS ONE*, 20(4 April). <https://doi.org/10.1371/journal.pone.0321887>
- Ranchordás, S. (2022). The Digitization of Government and Digital Exclusion: Setting the Scene. In *Law, Governance and Technology Series (Vol. 49, pp. 125–148)*. Springer Nature. [https://doi.org/10.1007/978-3-031-07377-9\\_7](https://doi.org/10.1007/978-3-031-07377-9_7)
- Ranganathan, M., & Lagarde, M. (2012). Promoting healthy behaviours and improving health outcomes in low and middle income countries: A review of the impact of conditional cash transfer programmes. *Preventive Medicine*, 55(SUPPL.), S95–S105. <https://doi.org/10.1016/j.ypmed.2011.11.015>
- Rizwan, M. S., Qureshi, A., & Sahibzada, I. U. (2024). Macro-prudential regulations and systemic risk: the role of country-level governance indicators. *Journal of Banking Regulation*, 25(3), 305–325. <https://doi.org/10.1057/s41261-023-00231-w>
- Sabates-Wheeler, R., & Devereux, S. (2007). Social protection for transformation. *IDS Bulletin*, 38(3), 23–28. <https://doi.org/10.1111/j.1759-5436.2007.tb00368.x>
- Saboor, A., Khan, A. U., Hussain, A., Ali, I., & Mahmood, K. (2015). Multidimensional deprivations in Pakistan: Regional variations and temporal shifts. *Quarterly Review of Economics and Finance*, 56, 57–67. <https://doi.org/10.1016/j.qref.2015.02.007>
- Saha, M., & Dutta, K. D. (2023). Does governance quality matter in the nexus of inclusive finance and stability? *China Finance Review International*, 13(1), 121–139. <https://doi.org/10.1108/CFRI-08-2021-0166>
- Sanner, T. A., Kempton, A. M., Russpatrick, S., & Sæbø, J. I. (2025). Governing digital platform ecosystems for social options. *Information Systems Journal*, 35(2), 422–449. <https://doi.org/10.1111/ISJ.12546;SUBPAGE:STRING:FULL>
- Sarjito, A. (2025). Leveraging virtual organizations for e-government effectiveness: A case study of Indonesia's SP4N-LAPOR! program. *EJournal of EDemocracy and Open Government*, 17(3), 25–58. <https://doi.org/10.29379/jedem.v17i3.996>
- Schubert, B. (2020). Beware of the Crocodile: Quantitative Evidence on How Universal Old Age Grants Distort the Social Assistance Systems of Low-Income Countries. *Poverty and Public Policy*, 12(2), 188–205. <https://doi.org/10.1002/pop4.281>
- Scott, W. R. (2005). Institutional theory: Contributing to a theoretical research program. *Great Minds in Management: The Process of Theory Development*, 37(2), 460–484.
- Shmueli, G., Sarstedt, M., Hair, J. F., Cheah, J.-H., Ting, H., Vaithilingam, S., & Ringle, C. M. (2019). Predictive model assessment in PLS-SEM: guidelines for using PLSpredict. *European Journal of Marketing*, 53(11), 2322–2347. <https://doi.org/10.1108/EJM-02-2019-0189>
- Singh, J., Batra, G. S., & Chatrath, S. K. (2025). Blockchain's role in social welfare, financial inclusion, and public sector innovations in India: A multi-sector analysis of government-led initiatives. *Cities*, 167. <https://doi.org/10.1016/j.cities.2025.106366>
- Singh, V., & Singh, G. (2018). Citizen centric assessment framework for e-governance services quality. *International Journal of Business Information Systems*, 27(1), 1. <https://doi.org/10.1504/IJBIS.2018.088568>
- Sohnesen, T. P., Fisker, P., & Malmgren-Hansen, D. (2022). Using Satellite Data to Guide Urban Poverty Reduction. *Review of Income and Wealth*, 68(S2), S282–S294. <https://doi.org/10.1111/roiw.12552>
- Southall, C., & Southall, R. M. (2024). Institutional theory. In *Encyclopedia of Sport Management* (pp. 495–496). Edward Elgar Publishing. <https://doi.org/10.4337/9781035317189.ch289>
- Streukens, S., & Leroi-Werelds, S. (2016). Bootstrapping and PLS-SEM: A step-by-step guide to get more out of your bootstrap results. *European Management Journal*, 34(6), 618–632. <https://doi.org/10.1016/j.emj.2016.06.003>
- Streukens, S., & Leroi-Werelds, S. (2023). Multicollinearity: An overview and introduction of ridge PLS-SEM

- estimation. In *Partial Least Squares Path Modeling: Basic Concepts, Methodological Issues and Applications* (pp. 183–207). [https://doi.org/10.1007/978-3-031-37772-3\\_7](https://doi.org/10.1007/978-3-031-37772-3_7)
- Sukhwai, P. C., & Kankanhalli, A. (2022). Agent-based Modeling in Digital Governance Research: A Review and Future Research Directions. In *Public Administration and Information Technology* (Vol. 38, pp. 303–331). Springer. [https://doi.org/10.1007/978-3-030-92945-9\\_12](https://doi.org/10.1007/978-3-030-92945-9_12)
- Tacoli, C. (2017). Food (In)security in rapidly urbanising, low-income contexts. *International Journal of Environmental Research and Public Health*, 14(12). <https://doi.org/10.3390/ijerph14121554>
- Umbach, G., & Tkalec, I. (2022). Evaluating e-governance through e-government: Practices and challenges of assessing the digitalisation of public governmental services. *Evaluation and Program Planning*, 93, 102118. <https://doi.org/10.1016/j.evalprogplan.2022.102118>
- Vian, T. (2020). Anti-corruption, transparency and accountability in health: concepts, frameworks, and approaches. *Global Health Action*, 13(sup1). <https://doi.org/10.1080/16549716.2019.1694744>
- Vinci, V., & Roelen, K. (2020). The relevance of institutions and people's preferences in the PSNP and IN-SCT programmes in Ethiopia. *International Social Security Review*, 73(1), 139–167. <https://doi.org/10.1111/issr.12230>
- Vinci, V., Gassmann, F., & Mohnen, P. (2022). The effect of institutional factors and people's preferences on expenditure for social protection. *International Social Security Review*, 75(1), 107–154. <https://doi.org/10.1111/issr.12290>
- Vujovic, A. N., Jonathan, G. M., & Hacks, S. (2024). Digitalisation and its Impact on Social Protection Programmes Effectiveness: A Case from South Africa. *Procedia Computer Science*, 237, 882–890. <https://doi.org/10.1016/J.PROCS.2024.05.177>
- Walsham, M., Kuper, H., Banks, L. M., & Blanchet, K. (2019). Social protection for people with disabilities in Africa and Asia: a review of programmes for low- and middle-income countries. *Oxford Development Studies*, 47(1), 97–112. <https://doi.org/10.1080/13600818.2018.1515903>
- Wang, J., Liu, K., Yuan, R., Kuang, X., & Qiu, H. (2025). Impact of participation in rural digital governance on grassroots political trust among high-quality farmers—analysis using survey data from 899 high-quality farmers in Jiangxi Province. *Frontiers in Sustainable Food Systems*, 9. <https://doi.org/10.3389/fsufs.2025.1543354>
- Waqas, M., & Awan, M. S. (2017). Social Protection, Gender, and Poverty: Application of Social Protection Index. *Journal of Policy Practice*, 16(4), 369–380. <https://doi.org/10.1080/15588742.2017.1294519>
- Wirtz, J., Lin, C., & Das, G. (2022). Viewpoint: cost-effective health care developments and research opportunities in China, India and Singapore. *Journal of Services Marketing*, 36(4), 461–466. <https://doi.org/10.1108/JSM-07-2021-0242>
- Wu, A. M., & Ramesh, M. (2014). Poverty reduction in urban China: The impact of cash transfers. *Social Policy and Society*, 13(2), 285–299. <https://doi.org/10.1017/S1474746413000626>
- Young, M. M. (2020). Implementation of Digital-Era Governance: The Case of Open Data in U.S. Cities. *Public Administration Review*, 80(2), 305–315. <https://doi.org/10.1111/puar.13156>
- Yuan, C., & Gu, R. (2025). Digital governance and economic development in Africa. *Applied Economics Letters*. <https://doi.org/10.1080/13504851.2025.2584468>