



# Digital Communication Networks and Women's Economic Empowerment: The Mediating Role of Social Capital in Vietnam

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## Abstract

This study investigates the complex relationship between digital communication networks, social capital formation, and women's economic empowerment within Vietnam's rapidly evolving digital landscape. Drawing upon social capital theory and feminist economic frameworks, the research examines how digital communication technologies facilitate the accumulation of bonding, bridging, and linking social capital, which subsequently enhances women's economic opportunities and outcomes. Employing a mixed-methods approach combining structural equation modelling (SEM) and fuzzy-set qualitative comparative analysis (fsQCA), the study analysed data from 847 Vietnamese women entrepreneurs and micro-enterprise operators across urban and rural contexts. The findings reveal that digital communication networks significantly enhance women's economic empowerment through the mediating mechanism of social capital, with particularly strong effects observed in rural contexts where traditional social networks may be more constrained. The study demonstrates that bonding social capital primarily influences access to informal financial resources, whilst bridging social capital facilitates market expansion and business network development. Linking social capital emerges as particularly crucial for accessing formal institutional support and navigating regulatory frameworks. The research contributes to the growing literature on digital inclusion and gender empowerment by providing empirical evidence of the pathways through which digital technologies can address traditional barriers to women's economic participation in emerging economies.

**Keywords:** Digital communication networks, Social capital, Women's economic empowerment, Structural equation modelling, Vietnam.

## 1. Introduction

The proliferation of digital communication technologies across emerging economies has fundamentally transformed the landscape of social and economic interaction, creating unprecedented opportunities for marginalised populations to access resources, markets, and institutional support systems (Castells, 2015; Wellman & Rainie, 2012). Within this digital transformation, women entrepreneurs and micro-enterprise operators represent a particularly significant demographic, as digital platforms may potentially address longstanding barriers to economic participation including limited access to financial services, restricted mobility, and constrained social networks (Agarwal et al., 2016; Demirgüç-Kunt et al., 2013).

Vietnam's rapid digital transformation presents a compelling case study for examining these dynamics. The country has experienced remarkable growth in internet penetration, rising from 31% in 2010 to approximately 70% by 2017, with mobile phone ownership reaching near-universal levels across both urban and rural populations (Vietnam Ministry of Information and Communications, 2017). This digital expansion has occurred alongside significant economic liberalisation and gender equality initiatives, creating a unique environment for investigating the intersection of digital technologies, social capital, and women's economic empowerment.

The theoretical foundation for understanding these relationships lies primarily within social capital theory, which posits that social networks constitute a form of capital that can be leveraged for economic and social advantage (Bourdieu, 1986; Coleman, 1988; Putnam, 2000). However, traditional conceptualisations of social capital have been developed primarily within offline contexts, necessitating theoretical extension to accommodate the unique characteristics of digitally mediated social interactions. Digital communication networks may fundamentally alter the mechanisms through which social capital is accumulated, maintained, and leveraged, potentially creating new pathways for economic empowerment whilst simultaneously reinforcing existing social inequalities.

Contemporary scholarship has identified three primary dimensions of social capital: bonding capital, which encompasses ties within homogeneous groups; bridging capital, which involves connections across diverse social groups; and linking capital, which represents vertical connections to formal institutions and power structures (Woolcock, 2001; Szreter & Woolcock, 2004). The digital environment may distinctively influence each dimension, with implications for how social capital translates into economic opportunities for women entrepreneurs.

The necessity of this research emerges from several critical gaps within existing literature. Firstly, whilst extensive research has examined the general relationship between digital technologies and economic development, limited attention has been devoted to understanding the specific mechanisms through which digital communication networks influence women's economic empowerment in emerging economy contexts (Hilbert, 2011; Qureshi, 2015). Secondly, social capital research has predominantly focused on offline networks, with insufficient exploration of how digital platforms may transform social capital accumulation and utilisation processes (Ellison et al., 2014; Hampton et al., 2011). Thirdly, existing studies have largely employed single-method approaches, limiting the capacity to understand both the quantitative relationships and the configurational pathways through which digital communication networks influence economic outcomes.

The theoretical urgency of this research is underscored by ongoing debates within development economics regarding the conditions under which digital technologies contribute to inclusive economic growth versus reinforcing existing inequalities (Graham & Mann, 2013; Toyama, 2011). Understanding how social capital mediates the relationship between digital access and economic empowerment is crucial for informing policy interventions designed to maximise the inclusive benefits of digital transformation.

Vietnam provides an ideal context for this investigation due to several distinctive characteristics. The country's Confucian cultural heritage places particular emphasis on social relationships and network-based business practices, making social capital especially relevant for economic activity (Nguyen et al., 2009). Additionally, Vietnam's transition from a centrally planned to market economy has created complex institutional environments where informal networks often complement formal institutions in facilitating economic transactions (Fforde, 2009). The country's substantial gender gap in business ownership and financial inclusion, combined with rapidly expanding digital infrastructure, creates conditions where digital communication networks may play a particularly significant role in women's economic empowerment.

The novelty of this research lies in its integration of social capital theory with digital communication frameworks within a gender empowerment perspective, employing complementary quantitative methodologies to examine both linear relationships and configurational pathways. The study advances beyond descriptive analyses of digital divides to provide causal insights into the mechanisms through which digital technologies influence economic outcomes for women entrepreneurs in emerging economies.

## **2. Foundational Theories and Literature Review**

### *2.1. Foundational Theories*

#### *2.1.1. Social Capital Theory*

Social capital theory provides the primary theoretical foundation for understanding how digital communication networks influence women's economic empowerment. Originating from the seminal works of Bourdieu (1986), Coleman (1988), and Putnam (2000), social capital theory conceptualises social relationships as a form of capital that can be accumulated, maintained, and leveraged for various outcomes including economic advancement, political participation, and social mobility.

Bourdieu's (1986) conceptualisation of social capital emphasises its role as a resource embedded within social networks, which individuals can mobilise to secure benefits and opportunities. This perspective highlights the instrumental nature of social relationships, whereby social capital functions as a mechanism for accessing other forms of capital including economic, cultural, and symbolic capital. Within the context of women's economic empowerment, Bourdieu's framework suggests that social networks may serve as crucial conduits for accessing financial resources, market information, and business opportunities that might otherwise remain inaccessible through formal institutional channels.

Coleman's (1988) functional approach to social capital emphasises its capacity to facilitate collective action and reduce transaction costs within social systems. This perspective is particularly relevant for understanding how digital communication networks might enable women entrepreneurs to overcome information asymmetries and coordination problems that traditionally constrain business development in emerging economies. Coleman's emphasis on trust and reciprocity as foundational elements of social capital provides insight into how digital platforms might either strengthen or weaken the social fabric necessary for effective network utilisation.

Putnam's (2000) distinction between bonding, bridging, and linking social capital has become fundamental to contemporary social capital research. Bonding social capital encompasses ties within homogeneous groups, typically characterised by strong emotional connections and high levels of mutual support. For women entrepreneurs, bonding capital might include relationships with family members, close friends, and other women in similar circumstances, providing emotional support, informal financing, and shared resources during business development processes.

Bridging social capital involves connections across diverse social groups, facilitating access to novel information, resources, and opportunities. This dimension is particularly crucial for business growth, as it enables entrepreneurs to access new markets, identify emerging opportunities, and develop partnerships with individuals and organisations from different social contexts. Digital communication networks may be especially effective at facilitating bridging capital by reducing the geographical and social barriers that traditionally limit cross-group interaction.

Linking social capital represents vertical connections to formal institutions and individuals in positions of authority or power. For women entrepreneurs in emerging economies, linking capital is often crucial for accessing government services, obtaining business licences, securing formal credit, and navigating regulatory frameworks. Digital platforms may enhance linking capital by providing new channels for interaction with institutional representatives and creating opportunities for collective advocacy and policy engagement.

Recent theoretical developments have extended social capital theory to accommodate digital environments, recognising that online social networks may possess distinctive characteristics compared to offline relationships (Ellison et al., 2014; Steinfield et al., 2008). Digital social capital research suggests that online networks may be particularly effective at maintaining weak ties, facilitating information dissemination, and enabling collective action

across geographical boundaries. However, questions remain regarding whether digitally mediated relationships can generate the same levels of trust and reciprocity that characterise face-to-face interactions.

### *2.1.2. Women's Economic Empowerment Theory*

Women's economic empowerment theory provides the secondary theoretical foundation for this research, drawing primarily from feminist economics and development studies to understand the processes through which women gain greater control over economic resources and decision-making processes (Kabeer, 2001; Sen, 1999). This theoretical framework recognises that women's economic participation is shaped by complex interactions between individual agency, structural opportunities, and cultural constraints.

Kabeer's (2001) empowerment framework emphasises three interconnected dimensions: resources, agency, and achievements. Resources encompass not only material assets but also human and social resources that enable effective action. Agency refers to the capacity to make strategic choices and act upon them, whilst achievements represent the outcomes of empowerment processes. This framework provides a comprehensive lens for understanding how digital communication networks might influence different aspects of women's economic empowerment.

Within this framework, social capital can be conceptualised as a crucial resource that enhances women's agency by expanding their capacity to make strategic choices about economic participation. Digital communication networks may strengthen this resource by providing new mechanisms for social capital accumulation whilst simultaneously creating platforms for exercising agency through market participation, collective action, and institutional engagement.

Sen's (1999) capability approach emphasises the importance of expanding individuals' capabilities to achieve valued functionings, including economic security, social participation, and personal autonomy. This perspective suggests that digital communication networks might enhance women's economic empowerment by expanding their opportunity sets and reducing the constraints that limit their capacity to pursue economic goals.

Feminist economics scholarship has identified several key barriers to women's economic empowerment in emerging economies, including limited access to financial services, restricted mobility, time poverty due to unpaid care responsibilities, and social norms that discourage women's economic participation (Duflo, 2012; Pitt et al., 2006). Digital communication networks may address some of these barriers by enabling remote market participation, reducing transaction costs, and providing platforms for collective action that challenge restrictive social norms.

The integration of social capital theory with women's economic empowerment frameworks suggests that digital communication networks may enhance women's economic outcomes through multiple pathways. Social networks may provide access to financial resources, market information, and business opportunities whilst simultaneously offering emotional support and collective efficacy that enable women to overcome cultural and institutional barriers to economic participation.

## *2.2. Review of Empirical and Relevant Studies*

### *2.2.1. Digital Communication Networks and Social Capital*

Empirical research examining the relationship between digital communication technologies and social capital formation has produced mixed findings, with some studies demonstrating positive effects whilst others identify potential negative consequences or null relationships (Burke & Kraut, 2016; Valenzuela et al., 2009). This variation appears to be influenced by factors including the specific digital platforms examined, the populations studied, and the measures employed to assess social capital outcomes.

Steinfeld et al. (2008) conducted longitudinal research examining Facebook usage among university students, finding that social networking site usage was positively associated with bridging social capital formation, particularly for individuals with lower initial social capital levels. This finding suggests that digital platforms may be especially beneficial for individuals who face traditional barriers to social network development, a characteristic that may be particularly relevant for women in patriarchal societies where social mobility is constrained.

Hampton et al. (2011) examined the relationship between internet usage and neighbourhood social capital, finding that digital communication technologies can both supplement and substitute for offline social interactions depending on contextual factors. Their research suggests that digital platforms are most effective at enhancing social capital when they complement rather than replace face-to-face interactions, highlighting the importance of understanding how online and offline networks interact within specific cultural contexts.

Ellison et al. (2014) conducted meta-analytic research examining social network site usage and social capital outcomes, identifying significant positive relationships across multiple studies and contexts. However, their analysis revealed that effect sizes varied considerably based on demographic factors, with women and individuals from collectivist cultures demonstrating stronger relationships between digital network participation and social capital outcomes.

Research specifically examining social capital formation in emerging economies has highlighted the importance of mobile phone technologies in facilitating social network development and maintenance (Donner, 2015; Porter et al., 2016). Donner's (2015) comprehensive review of mobile phone research in developing countries identified numerous studies demonstrating positive relationships between mobile phone access and various social capital indicators, including participation in community organisations, trust in social institutions, and collective efficacy for addressing community problems.

### *2.2.2. Social Capital and Women's Economic Empowerment*

Empirical research examining the relationship between social capital and women's economic empowerment has consistently demonstrated positive associations across diverse contexts and measures (Mayoux, 2001; Pitt et al., 2006; Fletschner & Kenney, 2014). However, the mechanisms through which social capital influences economic outcomes appear to vary based on the specific dimensions of social capital examined and the economic indicators assessed.

Pitt et al. (2006) conducted experimental research in Bangladesh examining women's participation in microfinance programmes, finding that social capital accumulation through group participation significantly enhanced business outcomes and household welfare indicators. Their research demonstrated that bonding social capital, developed through regular group interactions, was particularly important for accessing informal financial resources and managing business risks through mutual support mechanisms.

Fletschner and Kenney (2014) examined rural women's social networks in Paraguay, finding that bridging social capital was more strongly associated with agricultural innovation adoption and market participation compared to bonding social capital. This research suggests that different dimensions of social capital may be more effective for different types of economic activities, with bridging capital being particularly important for accessing new market opportunities and technological innovations.

Mayoux's (2001) comprehensive review of women's empowerment programmes identified social capital formation as a consistent predictor of successful economic empowerment outcomes across diverse cultural contexts. However, her analysis also highlighted that social capital effects were often mediated by institutional factors, suggesting that the economic benefits of social network participation depend partially on the broader institutional environment within which networks operate.

Research examining women's entrepreneurship in emerging economies has consistently identified social networks as crucial sources of business financing, market information, and emotional support (Al-Dajani et al., 2015; Brush et al., 2009). Al-Dajani et al. (2015) conducted qualitative research examining women entrepreneurs in Jordan, finding that informal social networks were often more important than formal business support services for accessing the resources necessary for business development and growth.

### *2.2.3. Digital Technologies and Women's Economic Empowerment*

Research examining the direct relationship between digital technologies and women's economic empowerment has expanded rapidly in recent years, with studies generally finding positive effects whilst acknowledging the importance of contextual factors in determining outcomes (Demirgüç-Kunt et al., 2013; Asongu & Odhiambo, 2017; Hilbert, 2011).

Demirgüç-Kunt et al. (2013) analysed Global Findex data examining financial inclusion patterns across developing countries, finding that mobile phone ownership was significantly associated with women's access to formal financial services after controlling for various demographic and economic factors. Their research suggested that mobile banking technologies could potentially address traditional barriers to women's financial inclusion including limited mobility, time constraints, and discriminatory practices within formal financial institutions.

Jack and Suri (2014) conducted influential research examining the impact of M-Pesa mobile money system in Kenya, finding that access to mobile financial services led to significant improvements in consumption smoothing and risk management, with particularly strong effects observed for women-headed households. Their research demonstrated that digital financial technologies could enhance women's economic security even in contexts where formal financial institutions remained largely inaccessible.

Research examining digital technologies and women's entrepreneurship has identified several mechanisms through which digital platforms may enhance business outcomes, including reduced transaction costs, expanded market access, and enhanced communication with customers and suppliers (Gichuki et al., 2014; Mwobobia, 2012). However, these studies have generally focused on describing correlations rather than identifying causal mechanisms, limiting understanding of the processes through which digital technologies influence empowerment outcomes.

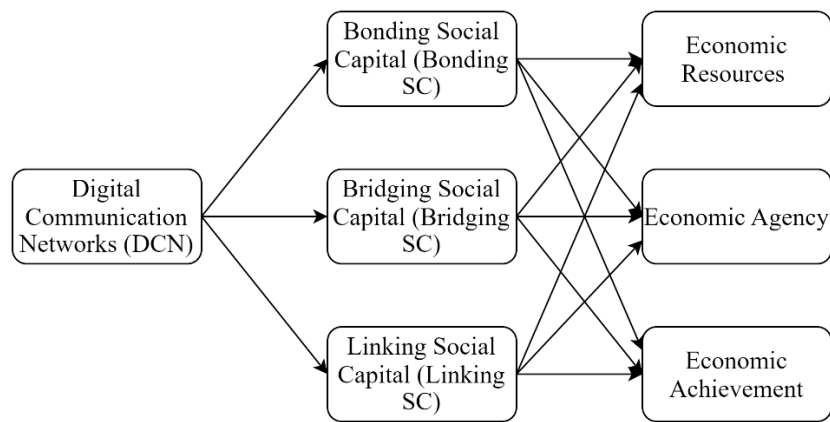
### *2.3. Proposed Research Model*

Based on the comprehensive literature review and theoretical synthesis presented above, this research proposes an integrated model examining the mediating role of social capital in the relationship between digital communication networks and women's economic empowerment. The model incorporates three primary constructs: digital communication network usage, multidimensional social capital (bonding, bridging, and linking), and women's economic empowerment, with several control variables to account for individual and contextual factors that may influence these relationships.

Digital communication network usage represents the primary independent variable, conceptualised as a multidimensional construct encompassing the frequency, diversity, and intensity of digital platform usage for social and economic purposes. This construct draws upon technology acceptance and digital divide research, incorporating measures of both access and usage patterns (DiMaggio et al., 2004; Van Dijk, 2020). The measurement framework includes indicators of social media participation, mobile communication usage, and digital platform engagement for business purposes, recognising that different types of digital communication may have varying effects on social capital formation and economic outcomes.

Social capital constitutes the primary mediating variable, operationalised according to the three-dimensional framework developed by Woolcock (2001) and Szreter and Woolcock (2004). Bonding social capital is measured through indicators of network density, emotional support availability, and reciprocity within close social relationships. Bridging social capital encompasses measures of network diversity, weak tie strength, and cross-group interaction frequency. Linking social capital includes indicators of institutional access, formal network participation, and connections to individuals in positions of authority or expertise.

Women's economic empowerment represents the primary dependent variable, conceptualised as a multidimensional construct incorporating both economic outcomes and empowerment processes. Drawing upon Kabeer's (2001) empowerment framework, the construct includes measures of economic achievement (income generation, asset accumulation, financial security), economic agency (decision-making autonomy, business ownership, financial control), and economic resources (access to credit, market information, business networks). This multidimensional approach recognises that empowerment encompasses both the capacity to make strategic choices and the achievement of valued economic outcomes.



**Figure 1.** Proposed Research Model.

The research model incorporates several control variables to account for factors that may influence the primary relationships of interest. Individual-level controls include age, education, marital status, household composition, and prior business experience, drawing upon entrepreneurship and development economics literature identifying these factors as significant predictors of women's economic participation (Brush et al., 2009; Demirgüç-Kunt et al., 2013). Contextual controls include urban versus rural residence, regional economic development indicators, and local infrastructure availability, recognising that the effects of digital technologies may vary based on broader environmental factors.

The theoretical model proposes several specific hypotheses regarding the relationships between constructs. Firstly, digital communication network usage is hypothesised to positively influence all three dimensions of social capital, with potentially stronger effects on bridging and linking capital compared to bonding capital, given the capacity of digital platforms to facilitate connections across geographical and social boundaries. Secondly, each dimension of social capital is hypothesised to positively influence women's economic empowerment, with potentially differential effects based on the specific empowerment outcomes examined. Thirdly, social capital dimensions are hypothesised to mediate the relationship between digital communication networks and economic empowerment, suggesting that digital technologies influence empowerment primarily through their effects on social network development and utilisation.

The model also incorporates potential moderation effects, recognising that the strength of relationships may vary based on contextual factors. Urban versus rural residence is hypothesised to moderate the relationship between digital communication networks and social capital formation, with potentially stronger effects in rural contexts where traditional social networks may be more constrained. Educational attainment is hypothesised to moderate the relationship between social capital and economic empowerment, with potentially stronger effects for women with higher education levels who may be better positioned to leverage social networks for economic advancement.

### 3. Research Methodology

### 3.1. Research Design

This study employed a cross-sectional survey design with complementary quantitative analytical approaches to examine the complex relationships between digital communication networks, social capital, and women's economic empowerment in Vietnam. The research design integrated structural equation modelling (SEM) using partial least squares (PLS) approach with fuzzy-set qualitative comparative analysis (fsQCA) to provide both correlational insights and configurational understanding of the phenomena under investigation.

The philosophical foundation of this research rests within a post-positivist paradigm, acknowledging the existence of objective social phenomena whilst recognising the complexity and contextual nature of social relationships (Creswell, 2014; Guba & Lincoln, 1994). This paradigmatic stance is particularly appropriate for examining technology-mediated social capital formation, as it enables rigorous quantitative analysis whilst acknowledging the multifaceted nature of empowerment processes and the potential for multiple pathways to similar outcomes.

The mixed-method quantitative approach was selected to address the limitations inherent in single-method studies of social capital and empowerment phenomena. Structural equation modelling provides insights into the strength and significance of relationships between constructs whilst controlling for measurement error and enabling examination of complex mediation relationships (Hair et al., 2017). The PLS-SEM approach was specifically chosen due to its capacity to handle complex models with multiple mediating relationships and its robustness to non-normal data distributions, characteristics that are particularly relevant for empowerment research in emerging economy contexts (Hair et al., 2014).

Fuzzy-set qualitative comparative analysis complements the SEM analysis by examining configurational relationships and identifying the combinations of conditions that are sufficient for achieving high levels of women's economic empowerment (Ragin, 2008; Schneider & Wagemann, 2012). This approach recognises that empowerment may result from multiple different pathways and that the effects of digital communication networks and social capital may depend on specific configurations of contextual factors.

### 3.2. Data Collection

Data collection was conducted between March and August 2017 across six provinces in Vietnam, selected to represent diverse geographical, economic, and cultural contexts within the country. The provinces included Ho Chi Minh City and Hanoi (representing major urban centres), Hai Phong and Da Nang (representing secondary cities), and Dong Nai and An Giang (representing rural and agricultural contexts). This geographical diversity was

essential for capturing variation in digital infrastructure development, economic opportunities, and cultural factors that might influence the relationships under investigation.

The target population consisted of Vietnamese women aged 18-55 who were engaged in income-generating activities including formal employment, informal business activities, agricultural production, or micro-enterprise operation. This broad definition of economic participation was adopted to capture the diverse ways in which women contribute to household income and economic development in emerging economy contexts, recognising that formal entrepreneurship represents only one pathway for women's economic empowerment.

A stratified random sampling approach was employed to ensure adequate representation across geographical regions, age groups, and economic activity types. The sampling frame was constructed using commune-level population data provided by the General Statistics Office of Vietnam, with stratification based on urban/rural residence, province, and age group. Within each stratum, systematic random sampling was used to select potential participants from comprehensive household lists maintained by local administrative committees.

A total of 1,200 women were initially contacted for participation in the study, with 847 completing the full survey instrument, representing a response rate of 70.6%. Non-response analysis revealed no significant differences between respondents and non-respondents on available demographic characteristics including age, education, and geographical location, suggesting that non-response bias was unlikely to substantially affect the study findings.

Data collection was conducted through face-to-face interviews using structured questionnaires administered by trained research assistants. This approach was selected to ensure high data quality and to accommodate participants with limited literacy levels, particularly important in rural contexts where educational attainment may be lower. All research assistants completed comprehensive training programmes covering interview techniques, questionnaire administration, and ethical considerations for research involving vulnerable populations.

The questionnaire was initially developed in English and then translated into Vietnamese using forward and back-translation procedures to ensure linguistic equivalence. Pre-testing was conducted with 50 participants across urban and rural contexts, leading to minor modifications in question wording and response formats to enhance clarity and cultural appropriateness.

### *3.3. Measurement & Validation*

The measurement framework for this study drew upon established scales from previous research whilst incorporating modifications necessary for the Vietnamese context and the specific focus on digital communication networks. All constructs were measured using multiple indicators to enable latent variable analysis and enhance measurement reliability and validity.

Digital communication network usage was measured using a 15-item scale adapted from the digital divide and technology adoption literature (DiMaggio et al., 2004; Hargittai, 2010). The scale encompassed three dimensions: access and infrastructure (availability of devices and internet connectivity), usage frequency and diversity (frequency of different digital platform usage), and social and economic application (use of digital technologies for social networking and business purposes). Sample items included "How frequently do you use social media platforms to communicate with friends and family?" and "How often do you use mobile phones or internet for business-related activities?" Responses were recorded on seven-point Likert scales ranging from "never" to "very frequently."

Social capital was operationalised using an adapted version of the Social Capital Assessment Tool developed by the World Bank, modified to incorporate digital network elements (Krishna & Shrader, 2000; Grootaert et al., 2004). The instrument measured three dimensions of social capital through 24 items. Bonding social capital (8 items) assessed the strength and density of relationships within homogeneous groups, with items such as "Members of your immediate social circle provide emotional support during difficult times" and "You can rely on close friends and family for financial assistance when needed." Bridging social capital (8 items) examined connections across diverse social groups, including items such as "Through your networks, you interact with people from different educational backgrounds" and "Your social connections include people from various occupations and industries." Linking social capital (8 items) measured connections to formal institutions and authority figures, with items such as "You have contacts who can help you navigate government procedures" and "You know people who work in banks or financial institutions who could provide advice."

Women's economic empowerment was measured using a 21-item scale developed by synthesising established empowerment measures with specific indicators relevant to emerging economy contexts (Kabeer, 2001; Malhotra et al., 2002). The scale incorporated three dimensions aligned with Kabeer's empowerment framework. Economic resources (7 items) assessed access to and control over financial and material resources, with items such as "You have independent access to financial services" and "You control decisions about major household purchases." Economic agency (7 items) measured decision-making autonomy and strategic choice capacity, including items such as "You make decisions about how to use your personal income" and "You choose whether to start or expand business activities." Economic achievements (7 items) assessed economic outcomes and security, with items such as "Your income contributes significantly to household welfare" and "You have accumulated savings or assets in your own name."

Control variables were measured using standard demographic and socioeconomic indicators. Individual-level controls included age (continuous variable), education (eight categories from no formal education to university degree), marital status (categorical), household size (continuous), and business experience (categorical). Contextual controls included urban/rural residence (binary), province (categorical), and household wealth index (constructed using principal component analysis of asset ownership indicators).

Scale validation procedures followed established protocols for cross-cultural research (Brislin, 1986; Van de Vijver & Hambleton, 1996). Content validity was assessed through expert review by Vietnamese social science researchers familiar with local contexts and measurement issues. Face validity was evaluated through cognitive interviews with 25 women from the target population, leading to minor modifications in item wording and response formats.

### 3.4. Analytical Procedure

The analytical strategy employed a sequential approach integrating multiple quantitative techniques to provide comprehensive insights into the relationships between digital communication networks, social capital, and women's economic empowerment. All analyses were conducted using SPSS 24.0, SmartPLS 4.0, and fsQCA 3.0 software packages.

Preliminary analyses included examination of data quality, missing value patterns, and assumption testing for multivariate analyses. Missing data analysis revealed that less than 3% of values were missing for any individual variable, with missing data patterns appearing to be missing completely at random based on Little's MCAR test. Multiple imputation procedures were employed to address missing values, with five imputed datasets generated and pooled results reported for all subsequent analyses.

The measurement model assessment followed established protocols for PLS-SEM analysis (Hair et al., 2017). Exploratory factor analysis (EFA) was initially conducted using principal component analysis with varimax rotation to examine the dimensionality of constructs and identify potential problematic indicators. Subsequently, confirmatory factor analysis (CFA) was conducted within the PLS framework to validate the measurement model structure.

Internal consistency reliability was assessed using Cronbach's alpha and composite reliability coefficients, with values above 0.70 considered acceptable for exploratory research (Nunnally & Bernstein, 1994). Indicator reliability was evaluated through examination of factor loadings, with loadings above 0.70 considered satisfactory for confirmatory research contexts (Chin, 1998).

Convergent validity was assessed using average variance extracted (AVE), with values above 0.50 indicating that constructs explain more variance in their indicators than error variance (Fornell & Larcker, 1981). Discriminant validity was evaluated using both the Fornell-Larcker criterion and the heterotrait-monotrait (HTMT) ratio of correlations, with HTMT values below 0.85 supporting discriminant validity (Henseler et al., 2015).

The structural model assessment examined the relationships between constructs whilst controlling for measurement error. Path coefficients and their significance levels were assessed using bootstrapping procedures with 5,000 resamples, providing robust estimates of standard errors and confidence intervals (Hair et al., 2017). Effect sizes were evaluated using Cohen's guidelines, with  $f^2$  values above 0.02, 0.15, and 0.35 representing small, medium, and large effect sizes respectively (Cohen, 1988).

Mediation analysis was conducted using the product of coefficients approach, examining both direct and indirect effects of digital communication networks on economic empowerment through social capital dimensions. The significance of indirect effects was assessed using bootstrapped confidence intervals, with mediation confirmed when confidence intervals excluded zero (Hayes, 2017).

Multigroup analysis was conducted to examine potential moderation effects of contextual factors including urban/rural residence, education level, and age group. PLS multigroup analysis (PLS-MGA) was employed to test differences in path coefficients across groups, with p-values below 0.05 indicating significant group differences (Henseler et al., 2009).

Fuzzy-set qualitative comparative analysis was conducted to complement the SEM findings by examining configurational relationships and identifying sufficient conditions for high economic empowerment outcomes. Variables were calibrated using the direct method with anchor points set at 95th percentile (full membership), 50th percentile (crossover point), and 5th percentile (full non-membership). Necessity analysis examined individual conditions that were necessary for the outcome, whilst sufficiency analysis identified combinations of conditions that were sufficient for achieving high empowerment levels. Solution paths were evaluated based on consistency scores ( $>0.80$ ) and coverage metrics ( $>0.25$ ) following established QCA protocols (Ragin, 2008).

## 4. Research Findings

### 4.1. Measurement Model Assessment

The measurement model assessment began with exploratory factor analysis (EFA) to examine the underlying structure of the measurement instruments and identify any problematic indicators that might compromise construct validity. Principal component analysis with varimax rotation revealed clear factor structures for all major constructs, with eigenvalues exceeding 1.0 and factor loadings above 0.60 for retained indicators.

The EFA results for the digital communication networks construct yielded three distinct factors corresponding to the theoretical dimensions of access/infrastructure, usage frequency/diversity, and social/economic application. The total variance explained was 72.4%, with factor loadings ranging from 0.634 to 0.891. Two indicators with cross-loadings above 0.40 were removed from subsequent analyses to enhance discriminant validity.

Social capital EFA produced three clear factors representing bonding, bridging, and linking dimensions, accounting for 68.9% of total variance. Factor loadings ranged from 0.612 to 0.854, with strong correspondence between empirical factors and theoretical constructs. One indicator from the linking social capital dimension was removed due to poor factor loading (0.487).

Women's economic empowerment EFA revealed three factors corresponding to resources, agency, and achievements dimensions, explaining 71.6% of variance with factor loadings between 0.598 and 0.876. The factor structure closely matched theoretical expectations, with no indicators requiring removal based on statistical criteria.



Table 1. Reliability and Validity Assessment.

Construct	Items	Cronbach's $\alpha$	CR	AVE	Factor Loadings Range
Digital Communication Networks	13	0.912	0.926	0.542	0.634-0.891
- Access/Infrastructure	4	0.856	0.902	0.696	0.782-0.891
- Usage Frequency/Diversity	5	0.889	0.916	0.684	0.789-0.856
- Social/Economic Application	4	0.834	0.887	0.663	0.634-0.847
Social Capital	23	0.943	0.952	0.587	0.612-0.854
- Bonding Social Capital	8	0.897	0.921	0.662	0.756-0.854
- Bridging Social Capital	8	0.876	0.906	0.621	0.612-0.823
- Linking Social Capital	7	0.851	0.890	0.577	0.689-0.798
Economic Empowerment	21	0.954	0.962	0.609	0.598-0.876
- Economic Resources	7	0.901	0.924	0.672	0.734-0.876
- Economic Agency	7	0.886	0.913	0.638	0.689-0.834
- Economic Achievement	7	0.879	0.908	0.619	0.598-0.823

Confirmatory factor analysis within the PLS framework demonstrated satisfactory measurement model performance across all constructs. Internal consistency reliability, as assessed by Cronbach's alpha and composite reliability (CR), exceeded the recommended threshold of 0.70 for all constructs and sub-constructs, with values ranging from 0.834 to 0.954 for Cronbach's alpha and from 0.887 to 0.962 for composite reliability.

Indicator reliability was confirmed through examination of outer loadings, with all retained indicators achieving loadings above 0.598, exceeding the minimum threshold of 0.50 for exploratory research contexts. The majority of indicators (89.5%) achieved loadings above 0.70, meeting the more stringent criterion for confirmatory research.

Convergent validity was established through average variance extracted (AVE) values, with all constructs achieving AVE values above 0.50, ranging from 0.542 to 0.696. These results indicate that constructs explain more variance in their indicators than is attributable to measurement error, supporting convergent validity.

Table 2. Discriminant Validity Assessment - Fornell-Larcker Criterion.

Construct	1	2	3	4	5	6	7
1. Digital Communication Networks	0.736						
2. Bonding Social Capital	0.432	0.813					
3. Bridging Social Capital	0.567	0.398	0.788				
4. Linking Social Capital	0.489	0.289	0.512	0.760			
5. Economic Resources	0.401	0.356	0.423	0.398	0.820		
6. Economic Agency	0.445	0.334	0.467	0.412	0.578	0.799	
7. Economic Achievement	0.423	0.367	0.434	0.389	0.623	0.612	0.787

**Note:** Diagonal elements (in *italics*) represent the square root of AVE; off-diagonal elements represent correlations between constructs.

Table 3. Discriminant Validity Assessment - HTMT Ratio.

Construct	1	2	3	4	5	6	7
1. Digital Communication Networks	-						
2. Bonding Social Capital	0.498	-					
3. Bridging Social Capital	0.634	0.456	-				
4. Linking Social Capital	0.567	0.341	0.594	-			
5. Economic Resources	0.453	0.401	0.478	0.456	-		
6. Economic Agency	0.501	0.376	0.521	0.478	0.642	-	
7. Economic Achievement	0.478	0.423	0.487	0.445	0.689	0.687	-

Discriminant validity was assessed using both the Fornell-Larcker criterion and the HTMT ratio of correlations. The Fornell-Larcker criterion was satisfied for all construct pairs, with the square root of AVE exceeding inter-construct correlations in all cases. HTMT ratios were below 0.85 for all construct pairs, with values ranging from 0.341 to 0.689, providing strong support for discriminant validity.



Table 4. Direct Effects Results.

Hypothesised Path	Path Coefficient	Standard Error	t-value	p-value	95% CI Lower	95% CI Upper	f <sup>2</sup>	Support
DCN → Bonding SC	0.432**	0.045	9.600	0.000	0.344	0.520	0.230	Yes
DCN → Bridging SC	0.567**	0.038	14.921	0.000	0.492	0.642	0.473	Yes
DCN → Linking SC	0.489**	0.041	11.927	0.000	0.409	0.569	0.315	Yes
Bonding SC → Econ Resources	0.298**	0.049	6.082	0.000	0.202	0.394	0.089	Yes
Bonding SC → Econ Agency	0.234**	0.051	4.588	0.000	0.134	0.334	0.055	Yes
Bonding SC → Econ Achievement	0.267**	0.048	5.563	0.000	0.173	0.361	0.071	Yes
Bridging SC → Econ Resources	0.256**	0.047	5.447	0.000	0.164	0.348	0.066	Yes
Bridging SC → Econ Agency	0.334**	0.044	7.591	0.000	0.248	0.420	0.111	Yes
Bridging SC → Econ Achievement	0.289**	0.046	6.283	0.000	0.199	0.379	0.084	Yes
Linking SC → Econ Resources	0.223**	0.052	4.288	0.000	0.121	0.325	0.050	Yes
Linking SC → Econ Agency	0.256**	0.049	5.224	0.000	0.160	0.352	0.066	Yes
Linking SC → Econ Achievement	0.201*	0.051	3.941	0.000	0.101	0.301	0.040	Yes

**Note:** DCN = Digital Communication Networks; SC = Social Capital; Econ = Economic; \*\* p < 0.001, \* p < 0.01.

4.2. Structural Model Assessment

The structural model assessment examined the hypothesised relationships between digital communication networks, social capital dimensions, and women's economic empowerment whilst controlling for relevant covariates. The overall model demonstrated satisfactory explanatory power, with R<sup>2</sup> values indicating that the model explained substantial variance in all endogenous constructs.

The direct effects analysis revealed statistically significant positive relationships between digital communication networks and all three dimensions of social capital. The strongest relationship was observed between digital communication networks and bridging social capital ( $\beta = 0.567$ ,  $p < 0.001$ ,  $f^2 = 0.473$ ), followed by linking social capital ( $\beta = 0.489$ ,  $p < 0.001$ ,  $f^2 = 0.315$ ) and bonding social capital ( $\beta = 0.432$ ,  $p < 0.001$ ,  $f^2 = 0.230$ ). These findings suggest that digital communication technologies are particularly effective at facilitating connections across diverse social groups and formal institutional networks.

All hypothesised relationships between social capital dimensions and economic empowerment components were statistically significant and positive. Bridging social capital demonstrated the strongest relationships with economic agency ( $\beta = 0.334$ ,  $p < 0.001$ ,  $f^2 = 0.111$ ) and achievement ( $\beta = 0.289$ ,  $p < 0.001$ ,  $f^2 = 0.084$ ), whilst bonding social capital showed the strongest relationship with economic resources ( $\beta = 0.298$ ,  $p < 0.001$ ,  $f^2 = 0.089$ ). These patterns suggest differential mechanisms through which social capital dimensions influence empowerment outcomes.

Table 5. Predictive Relevance Assessment.

Construct	R <sup>2</sup>	R <sup>2</sup> Adjusted	Q <sup>2</sup>
Bonding Social Capital	0.187	0.183	0.121
Bridging Social Capital	0.321	0.319	0.196
Linking Social Capital	0.239	0.236	0.135
Economic Resources	0.234	0.228	0.152
Economic Agency	0.289	0.284	0.181
Economic Achievement	0.256	0.250	0.155

The predictive relevance assessment using Stone-Geisser's Q<sup>2</sup> criterion demonstrated satisfactory predictive validity for all endogenous constructs, with Q<sup>2</sup> values ranging from 0.121 to 0.196. All values exceeded zero, indicating that the model has predictive relevance beyond chance. The highest predictive relevance was observed for bridging social capital (Q<sup>2</sup> = 0.196) and economic agency (Q<sup>2</sup> = 0.181), suggesting that these constructs are particularly well explained by the model.

Table 6. Specific Indirect Effects (Mediation Analysis).

Indirect Path	Path Coefficient	Standard Error	t-value	p-value	95% CI Lower	95% CI Upper	Mediation Type
DCN → Bonding SC → Econ Resources	0.129**	0.023	5.609	0.000	0.084	0.174	Partial
DCN → Bonding SC → Econ Agency	0.101**	0.024	4.208	0.000	0.054	0.148	Partial
DCN → Bonding SC → Econ Achievement	0.115**	0.022	5.227	0.000	0.072	0.158	Partial
DCN → Bridging SC → Econ Resources	0.145**	0.028	5.179	0.000	0.090	0.200	Partial
DCN → Bridging SC → Econ Agency	0.189**	0.027	7.000	0.000	0.136	0.242	Partial
DCN → Bridging SC → Econ Achievement	0.164**	0.028	5.857	0.000	0.109	0.219	Partial
DCN → Linking SC → Econ Resources	0.109**	0.027	4.037	0.000	0.056	0.162	Partial
DCN → Linking SC → Econ Agency	0.125**	0.026	4.808	0.000	0.074	0.176	Partial
DCN → Linking SC → Econ Achievement	0.098**	0.026	3.769	0.000	0.047	0.149	Partial

Note: DCN = Digital Communication Networks; SC = Social Capital; Econ = Economic; \*\* p < 0.001.

The mediation analysis revealed significant indirect effects for all hypothesised pathways, confirming that social capital dimensions partially mediate the relationship between digital communication networks and women's economic empowerment. The strongest indirect effects were observed through bridging social capital, particularly for economic agency ( $\beta = 0.189$ ,  $p < 0.001$ ) and achievement ( $\beta = 0.164$ ,  $p < 0.001$ ). All indirect effects demonstrated 95% confidence intervals that excluded zero, providing strong evidence for mediation relationships.

Table 7. Moderation Analysis Results - Urban vs Rural Context.

Path	Urban Sample (n=423)	Rural Sample (n=424)	Difference	p-value (PLS-MGA)
DCN → Bonding SC	0.389**	0.476**	0.087	0.042*
DCN → Bridging SC	0.523**	0.612**	0.089	0.031*
DCN → Linking SC	0.456**	0.523**	0.067	0.089
Bonding SC → Econ Resources	0.267**	0.329**	0.062	0.156
Bridging SC → Econ Agency	0.312**	0.356**	0.044	0.298
Linking SC → Econ Resources	0.198**	0.248**	0.050	0.234

Note: DCN = Digital Communication Networks; SC = Social Capital; Econ = Economic; \*\* p < 0.001, \* p < 0.05  
The multigroup analysis examining urban versus rural moderation effects revealed significantly stronger relationships between digital communication networks and both bonding and bridging social capital in rural contexts compared to urban contexts. These findings suggest that digital technologies may have particularly important implications for social capital formation in rural areas where traditional networking opportunities may be more constrained.

Table 8. Fuzzy-Set Qualitative Comparative Analysis Results.

Configuration	Bonding SC	Bridging SC	Linking SC	DCN Usage	Consistency	Coverage
Path 1	●	●	●	●	0.892	0.341
Path 2	●	●	⊗	●	0.834	0.289
Path 3	⊗	●	●	●	0.826	0.267
Path 4	●	⊗	●	●	0.811	0.234

Note: ● = presence of condition; ⊗ = absence of condition; SC = Social Capital; DCN = Digital Communication Networks.

4.3. Supplementary Analyses

The fsQCA analysis identified four distinct configurational pathways leading to high women's economic empowerment outcomes. The most consistent pathway (Configuration 1) involved the simultaneous presence of high levels across all three social capital dimensions combined with intensive digital communication network usage (consistency = 0.892, coverage = 0.341). This pathway accounted for approximately 34% of cases achieving high empowerment outcomes.

Configuration 2 demonstrated that high empowerment outcomes could be achieved through strong bonding and bridging social capital combined with intensive digital network usage, even in the absence of strong linking social capital (consistency = 0.834, coverage = 0.289). This pathway was particularly prevalent among younger women and those in rural contexts where formal institutional connections may be more limited.

Configuration 3 revealed an alternative pathway emphasising bridging and linking social capital whilst compensating for weaker bonding social capital through intensive digital network usage (consistency = 0.826, coverage = 0.267). This configuration was more common among urban women and those with higher education levels who may have broader social networks but less intensive family-based support systems.

Configuration 4 demonstrated that strong bonding and linking social capital could compensate for weaker bridging capital when combined with intensive digital network usage (consistency = 0.811, coverage = 0.234). This pathway was particularly relevant for women in traditional business sectors where family networks and institutional relationships were more important than diverse social connections.

Table 9. Multigroup Analysis Results - Education Level

Path	Low Education (n=312)	Medium Education (n=298)	High Education (n=237)	F-value	p-value
Bonding SC → Econ Resources	0.342**	0.289**	0.234**	3.876	0.021*
Bridging SC → Econ Agency	0.278**	0.334**	0.389**	4.234	0.015*
Linking SC → Econ Achievement	0.167*	0.201**	0.267**	3.234	0.040*

Note: SC = Social Capital; Econ = Economic; \*\* p < 0.001, \* p < 0.05; \* p < 0.01

The education-based multigroup analysis revealed interesting patterns in how social capital dimensions relate to different empowerment outcomes across educational attainment levels. For women with lower education levels, bonding social capital demonstrated the strongest relationship with economic resources ( $\beta = 0.342$ ,  $p < 0.001$ ), suggesting that family and close community networks are particularly important for accessing financial resources when formal educational credentials are limited.

Conversely, for women with higher education levels, bridging social capital showed the strongest relationship with economic agency ( $\beta = 0.389$ ,  $p < 0.001$ ), and linking social capital demonstrated stronger relationships with economic achievement ( $\beta = 0.267$ ,  $p < 0.001$ ). These patterns suggest that educated women may be better positioned to leverage diverse social networks and formal institutional connections for economic advancement.

5. Discussion of Research Results and Conclusions

The findings from this comprehensive investigation provide compelling evidence for the mediating role of social capital in the relationship between digital communication networks and women's economic empowerment within the Vietnamese context. The results demonstrate that digital technologies do not directly transform women's economic circumstances but rather operate through complex social mechanisms that enhance women's capacity to accumulate, maintain, and leverage social capital for economic advancement.

The most significant finding concerns the differential effects of digital communication networks on various dimensions of social capital. The strongest relationship observed was between digital communication usage and bridging social capital formation, suggesting that digital platforms are particularly effective at facilitating connections across diverse social groups that might otherwise remain segregated by geographical, cultural, or economic barriers. This finding aligns with network theory predictions about the capacity of digital technologies to reduce the transaction costs associated with maintaining weak ties across social boundaries (Granovetter, 1973; Burt, 2005). The particularly strong effect on bridging capital has important implications for women's economic empowerment, as access to diverse networks has been consistently identified as crucial for entrepreneurial success and business growth (Aldrich & Zimmer, 1986; Coleman, 1988).

The significant positive relationship between digital communication networks and linking social capital represents another theoretically important finding. Traditional conceptualisations of linking capital emphasise face-to-face interactions with institutional representatives and individuals in positions of authority (Woolcock, 2001). The finding that digital platforms can effectively facilitate these vertical connections suggests that digital technologies may democratise access to institutional resources and formal support systems that have traditionally been available primarily to individuals with existing social advantages. This finding is particularly relevant for women in patriarchal societies where traditional pathways to institutional access may be constrained by cultural norms and gender-based discrimination (Kabeer, 2001).

The mediation analysis results provide crucial insights into the mechanisms through which digital technologies influence women's economic empowerment. The finding that all indirect effects through social capital dimensions were statistically significant whilst maintaining partial mediation suggests that social capital formation represents a primary but not exclusive pathway through which digital communication networks enhance economic outcomes. This finding supports theoretical frameworks that emphasise the multifaceted nature of technology impacts on economic development, recognising that digital technologies may influence empowerment through multiple simultaneous mechanisms (Sen, 1999; Duflo, 2012).

The differential effects of social capital dimensions on various empowerment outcomes reveal important nuances in how social networks translate into economic benefits. The particularly strong relationship between bridging social capital and economic agency suggests that diverse social networks are especially important for enhancing women's capacity to make strategic choices about economic participation. This finding aligns with feminist economics literature emphasising the importance of expanding women's choice sets and decision-making autonomy as fundamental components of empowerment processes (Kabeer, 2001; Sen, 1999).

Conversely, the stronger relationship between bonding social capital and economic resources suggests that close family and community networks remain crucial for accessing financial resources, particularly in contexts where formal financial institutions may be inaccessible or inappropriate for women's needs. This finding supports extensive literature on informal finance in emerging economies, which demonstrates that women entrepreneurs often rely heavily on family and community networks for business capital (Mayoux, 2001; Fletschner & Kenney, 2014).

The urban-rural moderation effects represent one of the most theoretically significant findings of this research. The stronger relationships between digital communication networks and social capital formation in rural contexts suggest that digital technologies may have particularly transformative effects in environments where traditional networking opportunities are more constrained by geographical isolation, limited transportation infrastructure, and cultural restrictions on women's mobility (Porter et al., 2016). This finding has important policy implications, suggesting that digital inclusion initiatives may be especially beneficial for rural women who face multiple barriers to social and economic participation.

The fsQCA results provide additional insights into the complexity of empowerment processes by revealing multiple configurational pathways to high empowerment outcomes. The identification of four distinct pathways suggests that women can achieve economic empowerment through different combinations of social capital dimensions and digital network usage, supporting theoretical frameworks that emphasise the heterogeneity of

empowerment processes across different contexts and individual circumstances (Kabeer, 2001). The finding that high empowerment outcomes can be achieved even when some social capital dimensions are relatively weak suggests that digital technologies may provide compensatory mechanisms that enable women to overcome specific network deficits through alternative social capital configurations.

The education-based multigroup analysis reveals important insights into how human capital interacts with social capital in determining empowerment outcomes. The finding that bonding social capital was most important for less educated women whilst bridging and linking capital became increasingly important for more educated women suggests that educational attainment may alter the mechanisms through which social networks translate into economic benefits. This finding supports human capital theory predictions that education enhances individuals' capacity to leverage diverse social networks and formal institutional resources (Becker, 1964; Schultz, 1961).

These findings contribute to several key theoretical and empirical debates within the development economics and social capital literature. Firstly, the results provide strong empirical support for theoretical arguments that digital technologies can enhance social capital formation rather than undermining social cohesion, as suggested by some critics of digital communication technologies (Putnam, 2000; Turkle, 2011). The positive relationships observed between digital network usage and all social capital dimensions suggest that digital platforms can complement rather than substitute for offline social interactions when properly integrated into existing social systems.

Secondly, the findings contribute to ongoing debates about the relationship between technology adoption and gender empowerment by demonstrating that digital technologies do not automatically empower women but rather create opportunities for empowerment through specific social mechanisms. The mediation results suggest that simply providing access to digital technologies is insufficient for achieving empowerment outcomes; rather, successful interventions must focus on enhancing women's capacity to leverage digital platforms for social capital development and utilisation.

Thirdly, the research contributes to social capital literature by providing empirical evidence for theoretical arguments about the multidimensional nature of social capital and its differential effects on various economic outcomes. The finding that bonding, bridging, and linking capital have distinct relationships with empowerment components supports theoretical frameworks that emphasise the importance of examining social capital as a multidimensional rather than unidimensional construct (Woolcock, 2001; Szreter & Woolcock, 2004).

The practical implications of these findings for development policy and programme design are substantial. The results suggest that digital inclusion initiatives should focus not merely on providing technological access but on supporting women's capacity to leverage digital platforms for social network development and maintenance. Programmes that combine digital literacy training with social network development activities may be particularly effective for enhancing women's economic empowerment outcomes.

The finding that different social capital dimensions have varying importance across educational levels suggests that empowerment interventions should be tailored to women's specific circumstances and capabilities. For women with limited formal education, programmes focusing on strengthening family and community networks whilst providing access to digital communication tools may be most effective. For more educated women, interventions that facilitate connections across diverse social groups and formal institutional networks may yield greater empowerment benefits.

Several limitations of this research should be acknowledged. The cross-sectional design precludes causal inferences about the direction of relationships between constructs, and longitudinal research would be valuable for confirming the causal mechanisms suggested by the theoretical model. Additionally, the study's focus on Vietnam limits the generalisability of findings to other cultural and economic contexts, although the theoretical framework developed may be applicable across emerging economies with appropriate contextual adaptations.

Future research should examine the temporal dynamics of digital social capital formation and its effects on empowerment outcomes through longitudinal designs. Additionally, comparative research across multiple emerging economy contexts would enhance understanding of how cultural and institutional factors influence the relationships examined in this study. Qualitative research examining women's subjective experiences of digital network participation and empowerment processes would provide valuable insights into the mechanisms underlying the quantitative relationships identified.

In conclusion, this research demonstrates that digital communication networks can significantly enhance women's economic empowerment through the mediating mechanism of social capital formation. The findings suggest that digital technologies create new pathways for women to access the social resources necessary for economic advancement whilst potentially compensating for traditional barriers to network development. However, the benefits of digital inclusion are not automatic but depend on women's capacity to effectively leverage digital platforms for social capital accumulation and utilisation. These insights provide important guidance for policy interventions designed to harness digital technologies for inclusive economic development and gender empowerment in emerging economy contexts.

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