



DIGITAL TRANSFORMATION AS A LOCATION-SPECIFIC ADVANTAGE FOR FOREIGN DIRECT INVESTMENT: A SYSTEMATIC EVIDENCE REVIEW

Tran Nhu Maiⁱ

Nguyen Hong Anh

VNU University of Economics and Business,
Vietnam National University, Hanoi,
No. 144 Xuan Thuy Street, Cau Giay, Hanoi,
Vietnam

Abstract:

Digital transformation is increasingly treated as a determinant of international investment attractiveness, yet the evidence remains conceptually and methodologically fragmented. This study systematically synthesizes the empirical and theoretical literature linking digital capability to foreign direct investment (FDI), with particular attention to location advantage, measurement, causal identification, subnational heterogeneity, and spatial dependence. The review distinguishes four dimensions of digital capability—basic connectivity, digital government, productive digital adoption, and multidimensional digital transformation—and organizes the evidence around the ownership-location-internalization (OLI) paradigm. The final analytical corpus combines direct inward-FDI studies with complementary evidence on subnational institutions, reverse causality, and spatial econometric foundations. The synthesis shows that the modal empirical result is positive, but the effect is conditional rather than universal. Digital capability can lower information and transaction costs, improve government-business interaction, strengthen innovation and skills, and support network coordination; however, effects vary by development level, institutional quality, digital maturity, and FDI outcome. Recent studies also document nonlinearity and heterogeneous effects, while reverse-causality evidence indicates that FDI can itself accelerate digital adoption. The review therefore argues that digital transformation is best understood as a conditional, cross-cutting, location-specific advantage that augments rather than replaces traditional determinants of FDI. The main research frontier lies in subnational analysis, richer FDI outcome measurement, explicit treatment of endogeneity, and spatial models capable of separating local from regional spillover effects. These gaps are especially relevant for emerging economies such as Vietnam, where digital capability and FDI are unevenly distributed across provinces.

ⁱ Correspondence: email maitn@vnu.edu.vn

JEL: F21, F23, O33, R11, C23

Keywords: digital transformation; foreign direct investment; digital infrastructure; location advantage; OLI paradigm; spatial spillovers

1. Introduction

Foreign direct investment (FDI) remains an important mechanism through which capital, technology, managerial knowledge, and international production networks move across borders. Classical explanations of FDI location emphasize market size, production costs, human capital, physical infrastructure, trade openness, institutional quality, and agglomeration (Bevan and Estrin, 2004; Bénassy-Quéré et al., 2007; Blonigen and Piger, 2014). The rapid diffusion of digital technologies changes this location calculus because multinational enterprises increasingly depend on reliable connectivity, digital public services, data infrastructure, digitally skilled labor, cyber-security, and digitally enabled supplier networks. UNCTAD (2024) likewise highlights digital government and investment facilitation as increasingly relevant to the investment environment.

This change raises a theoretical question: should digital capability be treated as part of the location-specific advantage of host economies? The ownership-location-internalization (OLI) paradigm provides a natural starting point because the location component explains why firms choose one country, region, or city over another. Digital technologies can reduce search, communication, monitoring, and coordination costs; make government procedures more transparent and accessible; and increase the productivity of local ecosystems. In this sense, digital capability may modify the value of traditional location advantages rather than replace them.

The empirical literature has expanded from early studies of Internet diffusion and information and communication technology (ICT) to research on e-government, digital economy indices, digital finance, intelligent development, and multidimensional digital transformation. Early studies such as Choi (2003), Gani and Sharma (2003), and Addison and Heshmati (2003) established the basic proposition that ICT can influence FDI. More recent work uses dynamic panel estimators, natural experiments, threshold regressions, quantile models, city-level data, and bilateral gravity models. This methodological broadening has produced richer but less uniform findings.

Recent evidence cautions against a simple 'more digitalization, more FDI' interpretation. Zhang et al. (2024) find stronger effects in lower-income Chinese cities, Nguyen (2025) reports divergent effects between advanced and developing economies, and Ho et al. (2025) identify an inverted U-shaped relationship in developing countries. Mensah and Traore (2024) provide a stronger identification design using the staggered arrival of high-speed Internet in Africa, while Meyer and Nguyen (2005) demonstrate that subnational institutions materially shape FDI location decisions in Vietnam. Together, these studies suggest that the effect of digitalization depends on complementary institutions, stage of development, and local economic structure.

This review addresses five questions:

- 1) How is digital capability conceptualized and measured in FDI research?
- 2) Which theoretical mechanisms connect digital capability to inward FDI?
- 3) What does the empirical evidence show about the direction, heterogeneity, and nonlinearity of the relationship?
- 4) How do results vary by unit of analysis, FDI outcome, and econometric strategy?
- 5) Which conceptual, measurement, causal, and spatial gaps should guide future subnational research?

The contribution is to integrate a fragmented evidence base around a conditional location-advantage perspective and to connect the international literature to a research agenda for emerging economies, especially provincial analysis in Vietnam.

2. Literature Review

2.1. From ICT connectivity to multidimensional digital capability

Digital transformation is broader than the adoption of a single technology. Vial (2019) defines it as a process in which digital technologies generate significant changes in value creation, while Gong and Ribiere (2021), Hanelt et al. (2021), and Verhoef et al. (2021) show that the concept spans technology, organization, strategy, institutions, and ecosystems. At the country and regional level, direct observation is difficult, so empirical FDI research relies on observable proxies.

The literature can be organized into four measurement families. Basic digital connectivity includes Internet users, mobile subscriptions, broadband, ICT investment, and telecommunications intensity. Digital government captures online public services and the digitalization of administrative interfaces. Productive digital adoption focuses on the use of digital technologies by firms, finance, innovation systems, or intelligent technologies. Multidimensional digital transformation combines infrastructure, digital economy, digital society, e-government, and related capabilities in composite indices. These measures are related but not interchangeable, and the interpretation of estimated coefficients must match the actual content of the measure.

This distinction is crucial for research design. A telecommunications variable may be a strong proxy for digital connectivity over a long period, but it cannot by itself represent the full concept of digital transformation. Conversely, a composite index may better capture transformation but can hide the specific digital component that drives FDI. The review therefore uses digital capability as an umbrella term while preserving the narrower interpretation of each empirical measure.

2.2. OLI, institutions, and the digitalization of location advantage

Dunning's OLI paradigm remains the most direct theoretical bridge between digital capability and FDI. Location advantage traditionally includes market size, labor cost and quality, infrastructure, openness, resources, institutions, and government policy. Digital capability can enter this framework in at least four ways. First, connectivity lowers

information and coordination costs across distance. Second, digital government can reduce administrative frictions and improve transparency. Third, digital skills, innovation, data use, and digital finance can increase productive capacity. Fourth, digital networks can strengthen agglomeration and supply-chain coordination across nearby locations.

The institutional dimension is particularly important. Al-Sadiq (2021) finds that e-government stimulates inward FDI, while Kim and An (2022) show that corruption conditions the e-government-FDI relationship. Bussy and Zheng (2023), although focused on geopolitical risk rather than digitalization per se, show that governance, information, and technology shape the resilience of FDI. Meyer and Nguyen (2005) demonstrate in Vietnam that subnational institutional differences affect foreign investors' location and entry strategies. These findings imply that digitalization is not a standalone infrastructure shock: its investment value depends on the broader institutional environment.

The review therefore adopts a conditional location-advantage interpretation. Digital capability can increase the attractiveness of a host economy or region, but its marginal value is likely to vary with institutional quality, economic development, agglomeration, physical infrastructure, sectoral composition, and the type of FDI being considered.

2.3. Empirical evidence and emerging disagreement

The modal empirical result is positive. Choi (2003) reports that Internet diffusion is associated with higher bilateral inward FDI. Gani and Sharma (2003) find that information-technology achievement and diffusion are relevant to FDI in technologically advanced economies. Saidi and Mefteh (2020) identify dynamic relationships among transport, ICT, and FDI in 63 countries, while Arvin et al. (2021) document interlinkages among ICT connectivity, trade openness, FDI, and growth in G20 economies. Al-Sadiq (2021) extends the literature from connectivity to e-government.

The evidence becomes more nuanced in recent work. Ha and Huyen (2022) show that digitalization influenced foreign investment in Europe during the COVID-19 period, but the effect varies by digital component and context. Liu and Wang (2024) emphasize the complementarity between information conditions and ICT infrastructure. Zhang et al. (2024), using 270 Chinese cities, find stronger digitalization effects in lower-income cities. Ho et al. (2025) identify an inverted U-shaped effect and substantial heterogeneity among developing countries, while Nguyen (2025) finds different effects between advanced and developing economies.

Studies also broaden the outcome concept. Bobenič Hintošová and Bódy (2023) examine sustainable FDI in the digital economy, and Mensah and Traore (2024) exploit the arrival of high-speed Internet in Africa to identify the effect of digital infrastructure on FDI. Mai (2025) provides direct evidence for Vietnam using bilateral FDI from 42 partner countries. These contributions collectively support the relevance of digital capability while rejecting a universal linear effect.

3. Material and Methods

The study follows a systematic evidence-synthesis protocol designed for a relatively narrow and rapidly evolving literature. The reporting logic is informed by PRISMA 2020, but the review does not claim a fully reconstructable PRISMA census because the first retrieval round was assembled iteratively and the original database-export logs were not preserved. To avoid false precision, no invented identification or exclusion counts are reported. Instead, the manuscript reports the information sources, search date, search strings, eligibility rules, coding scheme, final analytical corpus, and the reason for separating direct, complementary, and reverse-causality evidence.

The search was updated on 17 August 2026. Retrieval used Google Scholar and publisher/DOI platforms, including Elsevier/ScienceDirect, Taylor & Francis, Wiley, Springer, MDPI, IMF, Oxford Academic/World Bank, and relevant institutional repositories. Backward and forward citation tracing was used to identify earlier ICT-FDI studies and methodological foundations. Bibliographic metadata, publication status, and DOI information for cited sources were rechecked against publisher pages, DOI records, or official institutional repositories on 20 August 2026.

Studies were eligible for the core synthesis when they empirically examined a digital variable in relation to inward FDI, FDI location, or an FDI outcome. Complementary studies were retained when they materially informed one of three issues: subnational location determinants, reverse causality between FDI and digitalization, or the methodological case for spatial analysis. Purely descriptive technology papers, studies without an identifiable FDI outcome, non-substantive commentary, and duplicate versions were excluded from the analytical evidence table. Foundational theory and methods sources were retained for interpretation but were not counted as direct digitalization-FDI evidence.

Each empirical study was coded for geographic context, sample period, unit of analysis, digital measure, FDI outcome, theoretical mechanism, estimator, principal finding, treatment of endogeneity or heterogeneity, and key limitation. Direct digitalization-to-inward-FDI evidence was kept separate from outward-FDI and reverse-causality evidence to avoid conflating different causal directions. The final evidence base used in the synthesis comprises direct inward-FDI studies, a small set of complementary outward/reverse-causality studies, Vietnam-specific subnational location research, and methodological foundations for spatial dependence. Because the field uses heterogeneous outcomes and estimators, a statistical meta-analysis was not attempted; synthesis is thematic and comparative.

Table 1: Search, selection, and coding protocol

Element	Review specification
Review type	Systematic evidence review; PRISMA-informed reporting without fabricated retrospective identification counts.
Search update	17 August 2026.
Information sources	Google Scholar; publisher and DOI platforms (Elsevier/ScienceDirect, Taylor & Francis, Wiley, Springer, MDPI, IMF, Oxford Academic/World Bank); citation chasing.
Core search logic	Digital transformation/digitalization/digital economy/ICT/Internet/broadband/e-government + foreign direct investment/FDI/inward FDI/FDI inflow.
Additional search terms	province, provincial, region, city, spatial, spillover, Vietnam, ASEAN, emerging economy, developing country.
Core inclusion	Empirical study with an identifiable digital measure and inward-FDI/location outcome.
Complementary inclusion	Subnational FDI-location evidence; reverse causality; spatial econometric foundations; selected outward-FDI evidence used only for mechanisms.
Exclusion	Duplicates; commentary without empirical analysis; no FDI outcome; digital concept not operationalized; insufficient methodological information for synthesis.
Coding fields	Context, period, unit, digital measure, FDI measure, theory/mechanism, method, endogeneity, main finding, heterogeneity, limitation.
Synthesis	Thematic comparative synthesis; no meta-analysis because effect sizes, outcomes, and estimators are not sufficiently homogeneous.

3.1 Review integrity and limitations

A methodological limitation is that the initial retrieval process cannot be reconstructed into a conventional PRISMA identification flow with defensible record counts. This is disclosed rather than replaced with estimated numbers. The consequence is that the review should be interpreted as a systematic evidence review rather than a bibliometric census of every publication in the field. The strength of the approach is transparent coding and explicit separation of evidence types; the limitation is that future updates should freeze database exports at the identification stage and report a complete PRISMA flow. This limitation does not affect the substantive interpretation of the studies included, but it constrains claims about exhaustive coverage.

4. Results and Discussion

4.1. Measurement has evolved faster than conceptual agreement

The first result of the review is conceptual fragmentation. Early studies operationalize the digital environment with Internet hosts, Internet users, mobile subscriptions, telephones, and ICT investment. Recent studies use e-government, digital economy indices, intelligent development, digital finance, and multidimensional transformation indicators. This progression increases substantive coverage but also reduces comparability across studies.

Four measurement families are analytically useful. Connectivity measures are transparent and suitable for long panels but narrow. Digital-government measures

capture administrative modernization but overlap with institutional quality. Productive-use indicators capture digital adoption in firms, innovation, skills, and finance but are often context-specific. Composite indices are conceptually broad but depend on weighting and aggregation choices. The practical implication is that empirical researchers should name the construct they actually measure rather than treating all digital indicators as interchangeable.

Table 2: Digital measurement families in FDI research

Measurement family	Typical indicators	Interpretation	Main limitation
Basic connectivity	Internet users; mobile; broadband; ICT investment	Basic digital access and communication capacity	Does not capture governance, skills, or productive use.
Digital government	E-government; online services; digital public administration	Administrative efficiency, transparency, investor-government interface	May overlap with institutional quality.
Productive digital use	Digital finance; intelligent technology; digital skills; firm adoption	Innovation, productivity, finance, and capability	Often context-specific and difficult to compare.
Composite transformation	Digital economy/society/government/readiness indices	Broad multidimensional digital capability	Weights and aggregation may hide the active component.

4.2. Digital capability affects FDI through four recurring mechanisms

The first mechanism is lower information and transaction costs. Foreign investors must identify markets, suppliers, workers, regulations, and local risks. Connectivity reduces search and communication costs, while data and digital platforms improve monitoring and coordination. This channel is consistent with Choi (2003), Gani and Sharma (2003), Saidi and Mefteh (2020), and the broader digital-economics framework of Goldfarb and Tucker (2019).

The second mechanism is institutional and administrative. Digital public services can make licensing and regulatory information more accessible, reduce face-to-face contact, improve traceability, and decrease procedural uncertainty. Al-Sadiq (2021) provides direct evidence that e-government stimulates inward FDI, while Kim and An (2022) show that the effect interacts with corruption. Bussy and Zheng (2023) further demonstrate that governance, information, and technology condition FDI responses to geopolitical risk.

The third mechanism is productive capability. Digital skills, innovation, digital finance, and firm-level adoption can raise productivity and increase the attractiveness of

a location to technology-intensive investment. Recent work on intelligent development and digital transformation of firms reinforces this mechanism, although outward-FDI studies are used here only as complementary evidence and not as direct estimates of inward-FDI attraction.

The fourth mechanism is network and spatial coordination. FDI tends to cluster around suppliers, infrastructure, labor pools, and existing foreign-invested firms. Digital networks can widen the effective economic area of a location and create benefits that cross administrative boundaries. This mechanism motivates future use of spatial econometrics, but it should not be inferred from a conventional panel coefficient alone.

4.3. The central empirical finding is positive, but conditional

Most direct studies report a positive association between digital capability and inward FDI. The result appears in early Internet studies, cross-country dynamic panels, e-government research, city-level Chinese studies, natural-experiment evidence from African Internet infrastructure, and recent work on Vietnam. The consistency of the positive sign across very different settings supports the proposition that digital capability has become part of the modern investment environment.

The strongest recent contribution, however, is evidence of conditionality. Zhang et al. (2024) find stronger digitalization effects in lower-income cities. Nguyen (2025) reports different effects in advanced and developing economies. Ho et al. (2025) identifies an inverted U-shaped relationship and heterogeneous effects across the FDI distribution. This suggests diminishing returns to basic digitalization and a growing importance of complementary institutions, cyber-security, specialized skills, and innovation systems at higher levels of digital maturity.

The policy implication is therefore not simply to maximize digital indicators. The relevant question is whether a host location has the combination of connectivity, institutional quality, skills, innovation, and business conditions needed to convert digital capability into investment value. Digital transformation is best understood as a conditional, cross-cutting location advantage.

4.4. Methodological evolution: dynamics, causal identification, and spatial dependence

The methods used in the literature range from OLS and fixed effects to dynamic GMM, gravity models, threshold estimators, quantile methods, and quasi-experimental designs. This evolution reflects three recurring identification problems. First, FDI is persistent over time. Second, digital capability may be endogenous because successful FDI locations can invest more in technology, skills, and administrative modernization. Third, national and subnational units may not be independent because investment and digital infrastructure are spatially clustered.

Mensah and Traore (2024) provide a particularly useful causal contribution by exploiting the arrival of high-speed Internet in Africa. Reverse-causality evidence from Vietnamese firms also shows why endogeneity matters: FDI can facilitate digital

transformation rather than only respond to it. Such studies should not be mixed into the same evidence table as digitalization-to-inward-FDI estimates because their causal direction is different.

For subnational research, spatial econometrics provides an additional layer. Anselin (1988) shows why spatial dependence can invalidate conventional inference, while LeSage and Pace (2009) formalize the interpretation of direct, indirect, and total effects in spatial regression models. These methodological sources are not part of the empirical digitalization-FDI evidence corpus; they are included to support the research agenda. A Spatial Durbin Model is attractive when both FDI in neighboring locations and spatially lagged explanatory variables may matter, but indirect effects must be calculated from the model's impact decomposition rather than read directly from the coefficient on a spatially lagged regressor.

4.5. Beyond FDI quantity: implications for FDI outcome measurement

Most studies use inward FDI flows, stocks, FDI/GDP, or project counts. These measures answer different questions. Flows capture current investment, stocks capture accumulated foreign capital, and project counts capture the frequency of location decisions. Bilateral gravity studies add source-host variation but may not reveal subnational differences within the host economy.

Future research can go beyond aggregate quantity by examining firm-level characteristics of foreign-invested activity, such as capital per firm, revenue per firm, employment per firm, labor productivity, and capital intensity. These variables should not automatically be labeled 'FDI quality'. They capture particular dimensions of scale, technology, productivity, or factor intensity, and a broader quality concept would require explicit theoretical justification and, ideally, multiple indicators. This distinction is especially important for provincial research in Vietnam, where enterprise data can support richer outcomes than aggregate registered capital alone.

Table 3: Core empirical evidence on digital capability and inward FDI

Study	Context / period	Digital measure	FDI outcome	Method	Main finding	Key limitation
Choi (2003)	14 source × 53 host countries	Internet hosts/users	Bilateral inward FDI	Gravity OLS/WLS	Internet diffusion associated with higher inward FDI.	Early-period data; limited digital construct.
Gani & Sharma (2003)	Technologically advanced countries, 1994-1998	IT achievement/diffusion	Inward FDI	Fixed-effects panel	Mobile phones and Internet hosts are significant pull factors for FDI.	Focus on high-income/technology-advanced sample.
Addison & Heshmati (2003)	Developing-country panel	ICT/telephony	FDI inflows	Panel analysis	ICT and democratization support FDI.	Broad cross-country design; early ICT proxy.
Gholami et al. (2006)	23 countries, 1976-1999	ICT investment	FDI	Causality analysis	ICT causes FDI in developed countries; partial reverse causality appears in developing countries.	Small heterogeneous sample; evidence differs by development level.
Saidi & Mefteh (2020)	63 countries, 2000-2016	ICT connectivity	FDI	GMM estimators	ICT, transport and FDI are dynamically interrelated; causal direction varies across income groups.	Cross-country averages; no subnational effects.
Al-Sadiq (2021)	178 countries, 2003-2018	E-government	FDI inflows	Unbalanced panel	E-government stimulates inward FDI.	Government digitalization may overlap with institutions.
Arvin et al. (2021)	G20 countries	ICT connectivity/penetration	FDI	Dynamic interlinkage analysis	ICT, openness, FDI and growth are interrelated.	Not designed as a single-equation causal FDI study.
Ha & Huyen (2022)	23 European countries	Digitalization components	Foreign investment	Panel models	Digitalization matters, with context-specific effects.	Europe/COVID period limits generalization.
Kim & An (2022)	Cross-country panel	E-government	Inward FDI	Moderation analysis	E-government-FDI effect depends on corruption.	Institutional overlap; country-level aggregation.
Bobenič Hintošová & Bódy (2023)	EU countries	Digital economy	Sustainable FDI	Cluster analysis	Digital economy and sustainability attributes of FDI are related.	Exploratory clustering; not causal.
Liu & Wang (2024)	144 countries, 2003-2016	ICT infrastructure	FDI inflows	Panel regression with interaction effects	ICT infrastructure strengthens the positive relationship between media freedom and FDI inflows.	Country-level measurement; institutional interactions.

Tran Nhu Mai, Nguyen Hong Anh
DIGITAL TRANSFORMATION AS A LOCATION-SPECIFIC ADVANTAGE
FOR FOREIGN DIRECT INVESTMENT: A SYSTEMATIC EVIDENCE REVIEW

Mensah & Traore (2024)	African locations	High-speed Internet arrival	FDI inflows	Quasi-experimental design	Internet infrastructure increases FDI, especially where complements exist.	Infrastructure shock captures connectivity, not full transformation.
Zhang et al. (2024)	270 Chinese cities, 2012-2019	Digitalization index/components	City-level FDI	System GMM	Positive effect concentrated in lower-income cities.	China-specific; composite index choices.
Ho et al. (2025)	67 developing countries, 2002-2023	Digitalization	FDI inflows	S-GMM, threshold, MMQR	Inverted U-shaped and heterogeneous effects.	Cross-country aggregate data.
Mai (2025)	Vietnam + 42 partners, 2007-2023	Multidimensional digital transformation	Bilateral FDI inflows	Modified gravity model (PPML)	Digital transformation significantly increases bilateral FDI inflows into Vietnam, with heterogeneous component effects.	National/bilateral unit; does not reveal provincial heterogeneity.
Nguyen (2025)	37 advanced + 100 developing economies, 2002-2022	Broadband/Internet	FDI inflows	Difference GMM / dynamic analysis	Effects diverge by development level.	Proxy measures remain narrow.
Yao & Wang (2026)	290 Chinese prefecture-level cities, 2012-2022	Intelligent development	City-level FDI	Two-way fixed effects; endogeneity and robustness checks	Intelligent development attracts FDI through digital human capital, innovation, and digital financial inclusion.	China-specific; broad intelligent-development construct.

Table 4: Complementary evidence kept separate from the direct inward-FDI synthesis

Study	Direction / role	Contribution to this review	Reason kept separate
Meyer & Nguyen (2005)	Subnational institutions → FDI location in Vietnam	Shows that within-country institutional differences affect FDI location and entry strategy.	Not a digitalization study.
Bussy & Zheng (2023)	Governance/information/technology condition FDI response to geopolitical risk	Supports the conditionality of technology and information in FDI decisions.	Digitalization is not the main treatment.
Fan et al. (2024); He et al. (2024)	Firm digitalization → outward FDI	Supports mechanisms involving transaction costs, capability, and nonlinearity.	OFDI direction differs from host-country FDI attraction.
Vu, Nguyen & Le (2026)	FDI → digital transformation in Vietnamese firms	Direct evidence of reverse causality/endogeneity risk.	Causal direction is the reverse of the core review question.
Anselin (1988); LeSage & Pace (2009)	Spatial econometric foundations	Supports future modelling of local and spillover effects.	Methodological foundations, not empirical digital-FDI evidence.

4.6. Research gaps and an integrated agenda

The first gap is conceptual. ICT, digitalization, digital economy, digital government, and digital transformation are frequently used as if they were equivalent. Future research should distinguish infrastructure, adoption, institutional digitalization, and transformational capability, and should align the name of the construct with the underlying data.

The second gap is measurement. Single telecommunications indicators provide long-term coverage but are narrow. Composite indices provide breadth but can obscure which component matters. Future studies should report component-level robustness and avoid interpreting a single connectivity measure as comprehensive transformation.

The third gap is causal identification. The relationship is potentially two-way: digital capability can attract FDI, while FDI can stimulate digital technology, skills, infrastructure, and institutional modernization. Dynamic panels, credible instruments, quasi-experimental variation, or carefully justified lag structures are therefore needed when causal language is used.

The fourth gap is the unit of analysis. National averages conceal regional heterogeneity. Meyer and Nguyen (2005) established the importance of subnational institutions in Vietnam, and Zhang et al. (2024) shows that city-level analysis reveals differences hidden in aggregate data. Provincial research is therefore not a simple disaggregation exercise; it can change substantive conclusions.

The fifth gap is spatial. Neighboring provinces compete for and jointly support foreign investment through labor markets, supplier networks, transport corridors, and digital infrastructure. Spatial models can distinguish local from regional channels, but they require theoretically defensible weight matrices and correct interpretation of direct, indirect, and total effects.

The sixth gap concerns FDI outcomes. Most studies focus on aggregate inflows. A richer agenda should distinguish FDI quantity, persistence, sectoral composition, capital intensity, productivity, and other firm-level characteristics without labeling every alternative outcome as 'quality'.

5. Recommendations

For theory, digital transformation should be treated as a conditional location-specific advantage that increases or modifies the value of existing location factors. Future work should explicitly state which mechanism—information, institutions, productivity, finance, skills, or networks—is expected to connect the chosen digital measure to FDI.

For empirical strategy, subnational studies should separate descriptive association, causal identification, and spatial dependence. A defensible sequence is to establish data quality and baseline fixed effects, test persistence and endogeneity, examine spatial autocorrelation, estimate appropriate spatial models when justified, and report impact decompositions rather than treating spatial-lag coefficients as spillover effects by themselves.

For measurement, researchers should distinguish digital connectivity from broader digital transformation and should use alternative FDI outcomes for robustness. Where enterprise data are available, capital intensity, revenue, employment, and productivity can complement aggregate FDI flows, provided each measure is interpreted narrowly and transparently.

For Vietnam, the most promising extension is a province-year panel combining FDI, stable ICT or telecommunications indicators, provincial institutions, market size, labor, infrastructure, and spatial relationships. This design can test whether digital capability operates locally, regionally, or conditionally through institutional quality and agglomeration.

6. Conclusion

This review shows that the digitalization-FDI literature has moved from narrow ICT infrastructure measures toward multidimensional digital capability and more demanding empirical designs. Across settings, the dominant result is positive, but the most important recent finding is conditionality: effects vary by development level, institutional quality, digital maturity, and the FDI outcome being measured.

The most defensible theoretical conclusion is therefore that digital transformation is a conditional, cross-cutting location-specific advantage. It can reduce information and transaction costs, improve government-business interaction, strengthen innovation and skills, and support network coordination, but it does not replace market size, institutions, labor, physical infrastructure, or agglomeration.

The research frontier lies below the national level. Provincial and city-level analysis can reveal heterogeneity and spatial spillovers that national averages conceal. Future work should combine conceptual precision with stronger identification, richer FDI outcome measurement, and spatial econometric methods that separate local from regional effects. These priorities are especially relevant for Vietnam and other emerging economies experiencing simultaneous digital transformation and geographically concentrated FDI.

Acknowledgements

The author acknowledges academic discussions and feedback received during the development of the broader doctoral research project. No external funding was received specifically for this review. The author declares no conflict of interest.

Creative Commons License Statement

This research work is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License. To view a copy of this license, visit <https://creativecommons.org/licenses/by-nc-nd/4.0>. To view the complete legal code, visit <https://creativecommons.org/licenses/by-nc-nd/4.0/legalcode.en>. Under the terms of this license, members of the community may copy, distribute, and transmit the article,

provided that proper, prominent, and unambiguous attribution is given to the authors, and the material is not used for commercial purposes or modified in any way. Reuse is only allowed under the terms of the Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License.

Conflict of Interest Statement

The author declares no conflicts of interest.

About the Author

Tran Nhu Mai is a PhD candidate in International Economics at VNU University of Economics and Business, Vietnam National University, Hanoi. Her research interests include foreign direct investment, digital transformation, international economics, regional development, and spatial econometrics.

Nguyen Hong Anh is a PhD candidate in International Economics at University of Economics and Business, Vietnam National University, Hanoi. Her research interests include digital transformation, green logistics, international economics, and trade.

References

- Addison T, Heshmati A, 2003. The New Global Determinants of FDI Flows to Developing Countries: The Importance of ICT and Democratization. WIDER Discussion Paper No. 2003/45. UNU-WIDER. [https://doi.org/10.1016/S1567-7915\(04\)04007-8](https://doi.org/10.1016/S1567-7915(04)04007-8)
- Al-Sadiq AJ, 2021. The Role of E-Government in Promoting Foreign Direct Investment Inflows. IMF Working Paper 2021/008. <https://doi.org/10.5089/9781513566795.001>
- Anselin L, 1988. Spatial Econometrics: Methods and Models. Kluwer Academic Publishers, Dordrecht. <https://doi.org/10.1007/978-94-015-7799-1>
- Arvin MB, Pradhan RP, Nair M, 2021. Uncovering interlinks among ICT connectivity and penetration, trade openness, foreign direct investment, and economic growth: The case of the G-20 countries. *Telematics and Informatics* 60: 101567. <https://doi.org/10.1016/j.tele.2021.101567>
- Bénassy-Quéré A, Coupet M, Mayer T, 2007. Institutional determinants of foreign direct investment. *The World Economy* 30(5): 764-782. <https://doi.org/10.1111/j.1467-9701.2007.01022.x>
- Bevan AA, Estrin S, 2004. The determinants of foreign direct investment into European transition economies. *Journal of Comparative Economics* 32(4): 775-787. <https://doi.org/10.1016/j.jce.2004.08.006>
- Blonigen BA, Piger J, 2014. Determinants of foreign direct investment. *Canadian Journal of Economics* 47(3): 775-812. <https://doi.org/10.1111/caje.12091>
- Bobenič Hintošová A, Bódy G, 2023. Sustainable FDI in the Digital Economy. *Sustainability* 15(14): 10794. <https://doi.org/10.3390/su151410794>

- Bussy A, Zheng H, 2023. Responses of FDI to geopolitical risks: The role of governance, information, and technology. *International Business Review* 32(4): 102136. <https://doi.org/10.1016/j.ibusrev.2023.102136>
- Choi C, 2003. Does the Internet stimulate inward foreign direct investment? *Journal of Policy Modeling* 25(4): 319-326. [https://doi.org/10.1016/S0161-8938\(02\)00202-8](https://doi.org/10.1016/S0161-8938(02)00202-8)
- Dunning JH, 1977. Trade, location of economic activity and the MNE: A search for an eclectic approach. In: Ohlin B, Hesselborn PO, Wijkman PM (eds), *The International Allocation of Economic Activity*. Palgrave Macmillan, London, pp 395-418. https://doi.org/10.1007/978-1-349-03196-2_38
- Dunning JH, 1988. The eclectic paradigm of international production: A restatement and some possible extensions. *Journal of International Business Studies* 19(1): 1-31. <https://doi.org/10.1057/palgrave.jibs.8490372>
- Dunning JH, Lundan SM, 2008. *Multinational Enterprises and the Global Economy*, 2nd edn. Edward Elgar, Cheltenham, UK.
- Fan L, Ou J, Yang G, Yao S, 2024. Digitalization and outward foreign direct investment of Chinese listed firms. *Review of International Economics* 32(2): 604-634. <https://doi.org/10.1111/roie.12702>
- Gani A, Sharma B, 2003. The effects of information technology achievement and diffusion on foreign direct investment. *Perspectives on Global Development and Technology* 2(2): 161-178. <https://doi.org/10.1163/156915003322763548>
- Gholami R, Lee S-YT, Heshmati A, 2006. The causal relationship between information and communication technology and foreign direct investment. *The World Economy* 29(1): 43-62. <https://doi.org/10.1111/j.1467-9701.2006.00757.x>
- Goldfarb A, Tucker C, 2019. Digital economics. *Journal of Economic Literature* 57(1): 3-43. <https://doi.org/10.1257/jel.20171452>
- Gong C, Ribiere V, 2021. Developing a unified definition of digital transformation. *Technovation* 102: 102217. <https://doi.org/10.1016/j.technovation.2020.102217>
- Ha LT, Huyen NTT, 2022. Impacts of digitalization on foreign investments in the European region during the COVID-19 pandemic. *Development Studies Research* 9(1): 177-191. <https://doi.org/10.1080/21665095.2022.2074863>
- Hanelt A, Bohnsack R, Marz D, Antunes Marante C, 2021. A systematic review of the literature on digital transformation: Insights and implications for strategy and organizational change. *Journal of Management Studies* 58(5): 1159-1197. <https://doi.org/10.1111/joms.12639>
- He Z, Liu Z, Zhao Y, Zhao Y, 2024. Is more digital always better? A nonlinear perspective on corporate digital transformation and OFDI. *International Review of Financial Analysis* 96: 103649. <https://doi.org/10.1016/j.irfa.2024.103649>
- Ho TL, Ngoc LH, Ho TH, 2025. Nonlinear and heterogeneous effect of digitalization on foreign direct investment: Evidence from developing countries. *Emerging Science Journal* 9(4): 1938-1961. <https://doi.org/10.28991/ESJ-2025-09-04-011>

- Kim K, An J, 2022. Corruption as a moderator in the relationship between e-government and inward foreign direct investment. *Sustainability* 14(9): 4995. <https://doi.org/10.3390/su14094995>
- LeSage JP, Pace RK, 2009. *Introduction to Spatial Econometrics*. Chapman and Hall/CRC, Boca Raton, FL. <https://doi.org/10.1201/9781420064254>
- Liu W, Wang J, 2024. Media freedom, information and communication technology infrastructure, and foreign direct investment inflows. *Managerial and Decision Economics* 45(1): 210-225. <https://doi.org/10.1002/mde.3997>
- Mai HG, 2025. Digital transformation as a catalyst for foreign direct investment: Evidence from an emerging economy. *Cogent Economics & Finance* 13(1): 2586304. <https://doi.org/10.1080/23322039.2025.2586304>
- Mensah JT, Traore N, 2024. Infrastructure quality and FDI inflows: Evidence from the arrival of high-speed Internet in Africa. *The World Bank Economic Review* 38(1): 1-23. <https://doi.org/10.1093/wber/lhad021>
- Meyer KE, Nguyen HV, 2005. Foreign investment strategies and sub-national institutions in emerging markets: Evidence from Vietnam. *Journal of Management Studies* 42(1): 63-93. <https://doi.org/10.1111/j.1467-6486.2005.00489.x>
- Nguyen VB, 2025. Digitalization's divergent impact on FDI inflows: A comparative analysis between advanced and developing countries. *Transnational Corporations Review* 17(3): 200148. <https://doi.org/10.1016/j.tncr.2025.200148>
- Saidi S, Mefteh H, 2020. Empirical analysis of the dynamic relationships between transport, ICT and FDI in 63 countries. *International Economic Journal* 34(3): 448-471. <https://doi.org/10.1080/10168737.2020.1765186>
- UNCTAD, 2024. *World Investment Report 2024: Investment Facilitation and Digital Government*. United Nations Conference on Trade and Development, Geneva.
- Verhoef PC, Broekhuizen T, Bart Y, Bhattacharya A, Dong JQ, Fabian N, Haenlein M, 2021. Digital transformation: A multidisciplinary reflection and research agenda. *Journal of Business Research* 122: 889-901. <https://doi.org/10.1016/j.jbusres.2019.09.022>
- Vial G, 2019. Understanding digital transformation: A review and a research agenda. *The Journal of Strategic Information Systems* 28(2): 118-144. <https://doi.org/10.1016/j.jsis.2019.01.003>
- Vu M, Nguyen G, Le T, 2026. Does FDI facilitate digital transformation in developing countries? Evidence from Vietnamese firms. *Industrial and Corporate Change: dtag001*. <https://doi.org/10.1093/icc/dtag001>
- Yao T, Wang D, 2026. Does intelligent development attract foreign direct investment? Empirical evidence from prefecture-level cities in China. *Sustainable Futures* 11: 101719. <https://doi.org/10.1016/j.sftr.2026.101719>
- Zhang D, Masron TA, Lu X, 2024. The impact of digitalization on foreign direct investment inflows into cities in China. *Cogent Economics & Finance* 12(1): 2330458. <https://doi.org/10.1080/23322039.2024.2330458>