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Digital Transformation and its Influence on Business Models in Emerging Economies

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Abstract

Digital platforms and ecosystems are transforming the value creation and capture of firms in emerging economies, but institutional conditions that determine the success of transformation have not been well modeled along with firm outcomes. This paper examines the effects of digital transformation on business-model innovation and firm viability, as well as the local institutional infrastructure that affects such effects. The effect of DIGI is analyzed via a simulated panel of 3,000 firms in 30 emerging economies and six sectors, and estimated using a fixed effects model based on lagged regressors and the inclusion of an interaction between DIGI and institutional quality. The classifiers are then used to predict firm viability in the out-of-time scenario. Digital transformation brings up business-model innovation only if the institution is sufficiently developed. The marginal effect is not significantly different from zero until the institutional index is approximately 0.30, but is 0.25 at an institutional index of 0.75. After adding institutional features, the precision of viability prediction increases to 88.3 percent, compared with 79.5 percent using only demographic features, while gradient boosting reaches 89.7 percent. Logistics and retail are the sectors with the most spillovers. The overall policy implications are the harmonization of regulation, the investment in infrastructure, and inclusive digital entrepreneurship.

Keywords: Digital Transformation, Business Models, Emerging Economies, Institutional Infrastructure, Digital Ecosystems, Policy.

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Introduction

The emergence of digital platforms is an important feature of the contemporary business environment in Africa, Asia, and Latin America because of changes in the way that organizations operate and communicate with their stakeholders. Digital platforms like online marketplaces, digital payment solutions, logistics tools, and data solutions support transactions between thousands of microenterprises that used to engage in face-to-face interaction previously. Digitalization has made transactions more efficient, faster, facilitated market reach, and increased business connectivity. Moreover, small businesses can gain access to wider consumer audiences, make supply chain processes easier, overcome obstacles in conducting activities, and use resources effectively thanks to the implementation of digital platforms. These innovations are not only a part of technological advances or changes in business processes; they mark a major change in business model logic. In particular, digitalization changes the mechanisms for value creation, delivery, and capture for organizations. Today, businesses are becoming more dependent on integrated digital ecosystems, data, and platform interaction to acquire competitive advantage and develop further.

A recent study indicates that this transition is closely linked to the firm's environment. Digital transformation's impact on business model innovation is found to moderate the impact of environmental turbulence in emerging economies through research (Carbonell Garcia et al., 2026). A digitalization benefit analysis for small and medium-sized enterprises (SMEs) reveals that the positive effects of digitalization on internationalization are not just about which technologies are being used but about the digitalization capabilities, resilience, and maturity of the SMEs. With digital banking, the Covid-19 period was a stark reminder of the need for banks to reimagine business models around remote services (Yıldırım & Erdil, 2024). The evidence on frugal innovation indicates that frugal innovation can make digital business transformation a way for SMEs in emerging markets to remain resilient in the face of limited resources (Al Omoush et al., 2025). Organizational drivers in an emerging economy have been studied, and the factors identified as those that influence whether the companies change or not are leadership, resources, and readiness (Egala et al., 2024). A similar lesson is provided by education, where online learning opportunities are seen as broad access, but limited by infrastructure and connectivity in emerging markets (Mhlanga, 2024).

There are gaps between these strands. Most exam writing companies, or a single sector, consider only the institution as background. It is the intention here to shift this balance. If regulation, digital readiness, and transaction costs determine the opportunities a firm may have to work with technology, then macro-level institutional infrastructure should be considered as an active moderator of micro-level business-model change, and its impact should be given time to play out.

The purpose of the paper is to identify three major goals related to the investigation of the connection between digital transformation, institutional infrastructure, and business-model innovation. Firstly, it aims at analyzing the impact of digital transformation and institutional infrastructure in previous periods on business-model innovation. Secondly, it assesses the predictive accuracy of the algorithm developed for detecting successful business models, paying special attention to precision as one of the key performance measures. Thirdly, it identifies interactions between various aspects of digital transformation and analyzes the joint effect of such dimensions on organizational innovation. This research makes three major contributions to the body of knowledge. To begin with, it proposes a unified analytical approach that links institutional structures, digital ecosystems, and organizational behavior. Moreover, it furnishes empirical proof that institution-based factors have a significant impact on the way in which the advantages derived from digitalization are shaped. Also, the paper suggests an open and replicable methodological framework that can be applied with the help of enterprise survey data. Such a framework allows for the systematic assessment of digitalization impacts and comparative analysis of digitalization outcomes in various business settings, as well as allows other researchers to investigate the effects of digital competence and institutional factors on business-model innovation.

Theoretical Framework

Microfinance and Technology

Digital Ecosystems are groups of companies, platforms, and customers that are connected by the same data and by the same infrastructure. The key characteristic of them is the network externality: the more people that join, the more valuable it is to them. The data economy literature points to the value generated by data creation, sharing, and analysis as a source of value in the business, societal, and transformation realms, as well as to potential concentration and capability gaps that constrain who gains (Sestino et al., 2025). Innovation evidence indicates that digital technologies can have an impact on the turnover organizations earn from innovation and the kind of innovation undertake (Vărzaru

& Bocean, 2024). Here, there are two implications of network externalities. The size and quality of the digital investment ecosystem around it should be a positive driver for returns, and growth in any given sector should positively impact sectors that are connected via supply, finance, and distribution.

Institutional Economics

An institutional view is introduced to account for variation in outcomes by place in using the same technology. Firms are able to contract, pay, ship, and comply easily or not, depending on the regulatory frameworks, digital readiness, and transaction costs. In the analysis of digital transformation in international trade, one finds that opportunities and challenges go hand in hand, and the impact of these depends on the policy formulation (Mirzaye & Mohiuddin, 2025). The study by Sumadi on circular economy business model adoption in Malaysia also reveals drivers and inhibitors for the adoption of the business model, which once again underscores the importance of institutional and organizational barriers to business model change, despite the obvious benefits (Ting et al., 2024). Research on government subsidies suggests that subsidies can encourage digital transformation of manufacturing companies (Zhao et al., 2024). The results of the corporate productivity analysis show that digital transformation can increase the total factor productivity via mediation processes including green technology innovation (Wu et al., 2024). These works suggest that institutions can be considered as a conversion device and that the impact of these institutions could be seen after a certain time.

Hypotheses

Three hypotheses follow. H1: Lagged Digital Transformation increases business-model innovation. H2: Digital transformation has a weaker impact and may even be weaker or lack an impact where the institutions are weak. The linkages across sectors carry digital progress between sectors, and institutional characteristics enhance the ability to predict the viability of firms.

Analytical Approach and Model Specification

Conceptual structure

The structure of the analysis is shown in fig. 1. Macro-level institutions (regulatory institutions, digital readiness, transaction costs and subsidies) interact with the digital ecosystem at the meso level (digital platforms, digital spillovers, shared data infrastructure). Ecosystems, in turn, influence enterprise capabilities, business-model innovation, and finally survival, growth, and resilience. The term 'institutional effects' will take 1-2 years to play out.

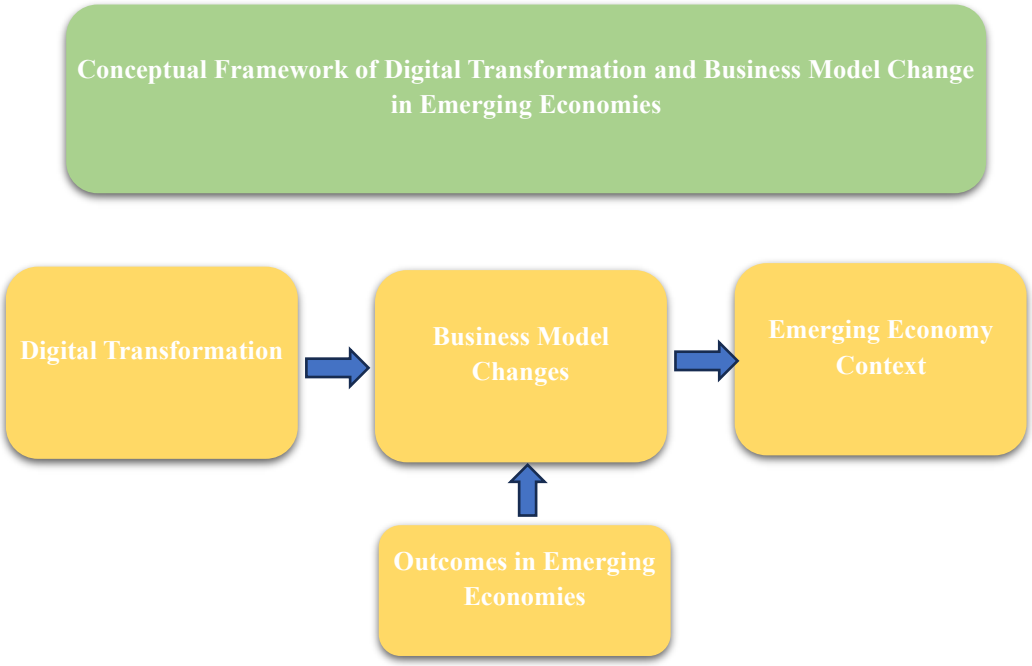


Fig. 1: Conceptual Framework of Digital Transformation and Business Model Change in Emerging Economies

In fig. 1, the influence of digital transformation on value propositions, operations, customer engagement, and business models is shown via the use of technology, analytics, automation, digital platforms, and connectivity. These influences are shaped by the characteristics of the emerging economy and have a positive impact on the overall performance of the businesses.

Data

The macro-level inputs included in the study design are indicators of ICT development, World Bank enterprise surveys, and digital adoption indicators. This demonstration uses a full structure simulation, not a download from those sources, which has been calibrated with the sample of the appropriate size. This demonstration uses a calibrated simulation with full structure, which is not a downloaded source. It has 3,000 companies across 30 emerging markets, across six sectors: manufacturing, retail and trade, financial services, agri-food, logistics, and health and education. The outcomes are observed over the period of 2019-2023 (15,000 firm-years) and lagged by one and two years. All firms have a digital intensity score that ranges from 0 to 1, with a base score in each sector. There is also an institutional infrastructure index (from 0 to 1) that is also improving over time in each country. The way that the sectors of an economy are linked with each other is measured by a sector linkage structure, an analogy for which would be an input–output matrix. In real data, this structure would be taken from national input–output tables.

Model

Business-model innovation is an index that increases when a company innovates its business model by altering its value creation and value capturing ways. The reason for this is explained by digital transformation lagged one and two years, institutional infrastructure lagged one year, and an interaction between lagged digital transformation and lagged institutions, as well as a linkage-weighted measure of digital intensity in other sectors, lagged one year. All common firm characteristics are eliminated through firm fixed effects, and standard errors are clustered at the country level, as institutions differ by country. H2 is tested in the interaction coefficient, while the spillover part of H3 is tested in the linkage coefficient.

With viability defined as survival with growth, a prediction is then made on the subsequent period. Models are trained on 2019 to 2021 and tested out of time on 2022 to 2023, resulting in a test set of 6,000 firm-years with 74 percent of firms being viable. The performance of three classifiers is compared: logistic regression using only firm features; logistic regression using only institutional and linkage features; and gradient boosting using the same extended features. Precision is the percentage of companies that are deemed to be viable that are actually viable, and is emphasized because it is very costly to the lenders as well as the programs to back a company with a failing business model.

Results and Ecosystem Mapping

Institutional Moderation of Digital Transformation

The average score for digital intensity went from 0.44 in 2019 to 0.63 in 2023, while the average score for the business-model innovation index increased from 0.23 in 2019 to 0.39 in 2023. This combined increase obscures significant inter-institutional variation, as shown in the estimates.

On average, there is a positive and significant relationship between lagged digital transformation and business-model innovation with a coefficient of 0.110 for 1 year and 0.082 for 2 years. The two lags in total contribute 0.19, which is consistent with H1. The correlation of interaction with infrastructure is very favorable, at 0.542 with a standard error of 0.098. This supports H2. The direct effect of the infrastructure of institutions is also positive and amounts to 0.344. A linear relationship exists between the spillover term and the innovation index with a coefficient of 0.470 (about 0.047).

The marginal effect will not be fixed. It has an institutional index of 0.25 and is −0.025, which is not different from zero. At 0.50 it is 0.110, and at 0.75 it is 0.246. The line crosses 0 at an index of ~0.30. The estimated effect becomes negative and equals −0.106 at an index of about 0.10 in the weakest settings, consistent with firms being faced with transformation costs without the hard infrastructure to support the returns. The real-world lesson is that digital investment isn't always a good thing. It pays more than twice in a mid-level institutional setting and less than that in a strong institutional setting; and if below a threshold, it may not pay at all. This pattern aligns with the notion that barriers can prevent business-model change even in the face of clear benefits (Ting et al., 2024) and with the idea that a business model is only as successful as the design of the policies that support it, in that digital opportunities can only benefit businesses if the policies supporting them are designed appropriately (Mirzaye & Mohiuddin, 2025).

Predicting Business-Model Survival and Growth

A model based on firm characteristics only can achieve a precision of only 79.5 percent, just slightly higher than that of a naive rule that would classify all firms as viable. Incorporating institutional and linkage features increases logistic precision to 88.3 percent, and the recall rate declines by about 1 percent, from 93.5 to 92.5 percent. The ROC curve's area increases from 0.77 to 0.92. The highest precision is obtained by gradient boosting at 89.7 percent, while the recall is 91.0 percent, but the results don't differ significantly from the logistic model's outcome. The institutional infrastructure has the greatest importance of 63 percent, while lagged digital intensity is 18 percent, and firm size is 12 percent. The institutional features therefore have the highest predictive information, thus confirming H3. A simple and straightforward model works almost as well as a more complex model, and it is more likely to achieve success if backed by a lender or program manager assessing the institutional setting.

Cross-Sector Spillover Mapping

This allows combining the estimated spillover coefficient (S) with the sector linkage structure (L) to get the implied transmission (S*L) between sectors. The strongest single link is between logistics and manufacturing, while the other links are finance to retail, retail to finance, and logistics to health and education. By receiver sector, logistics is the top transmitter of digital progress, while retail and trade and health and education are at the same level. By receiver sector, logistics is the largest transmitter of digital progress, followed by retail and trade, and health and education and manufacturing. Agri-food is the lowest communicator. This indicates that logistics and retail platforms are hubs, as suggested by the mapping. It have improved across a broad spectrum of individual sectors, since most rely on transportation and settlement of payments. It also implies that agri-food is a receiver and not a source, making the change in agri-food depend on changes in other areas. The weights used for these transmissions are subject to the assumption of the linkages and will need to be recalculated using actual input–output data.

Discussion

The results link up the strands from previous research. The benefit of digital transformation in terms of capabilities and context is aligned with research on internationalization and resilience of SMEs (Aghazadeh et al., 2024; Al Omoush et al., 2025) and the benefits of digital transformation for firms to deal with turbulence (Carbonell Garcia et al., 2026). The significance of institutional characteristics in prediction is consistent with the expectation that the drivers of institutional change influence the outcomes of transformation as outlined in the literature (Egala et al., 2024), and the productivity and subsidy evidence is consistent with institutions being a mechanism of conversion (Zhao et al., 2024; Wu et al., 2024). The negative impact at very low institutional levels indicates the limiting potential of infrastructure gaps (Mhlanga, 2024) to the digital promise. All magnitudes are parameters of the simulated design: the patterns of quality are those that are to be tested on observed data.

Policy and Strategic Implications

The returns of digital transformation increase as institutional quality increases, which in turn reduces the cost of transactions and increases returns on investment for the firm, by harmonizing digital regulation across jurisdictions, including e-commerce, data, payments and digital trade (Mirzaye & Mohiuddin, 2025). The benefits of harmonization are most useful for the logistics and retailing centers and hubs highlighted in the spillover map; these benefits benefit other sectors.

The estimated crossover at an index of ~0.30 implies that public investment should first push the weakest settings above the threshold; if that were to do otherwise, would incur transformation costs without gain. In those contexts, connectivity and solid payment and power rails need to be addressed before subsidies for the firms. For institutions that are already satisfactory, their role is to be reinforced by subsidies (Zhao et al., 2024).

The institutional context is a better predictor of viability than digital scores of the firms, so support programs need to include more than just finance – that should include capability building and access to ecosystem infrastructure, as well as target agri-food and other net-receiving sectors that rely on progress in other sectors. Lenders should apply institutional indicators as well as firm data in screening and should opt for transparent models, as that do not offer much more than complex ones.

Institutional conditions should be part of the investment case; Digital investments should be sequenced with a time horizon of one to two years; Investment opportunities should be considered in ecosystems that have strong links.

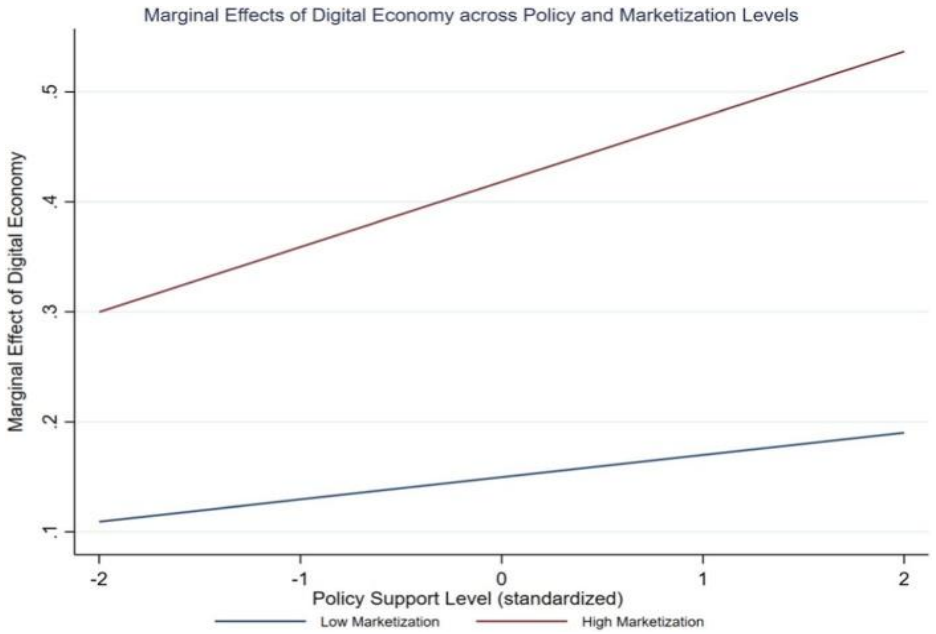


Fig. 2: Institutional Infrastructure and the Marginal Effects of Digital Transformation on Business-Model Innovation

Fig.2. illustrates the moderating influence of institutional infrastructure on the relationship between digital transformation and business-model innovation. The marginal effect increases progressively with improvements in the institutional infrastructure index. At a low institutional level of 0.10, the estimated effect is negative (−0.106), indicating that inadequate institutional support may limit the benefits of digital investments. At 0.25, the effect approaches zero (−0.025), while at 0.50, it becomes positive (0.110). The highest effect of 0.246 is observed at 0.75. These findings demonstrate that supportive institutional conditions strengthen the contribution of digital transformation to business-model innovation.

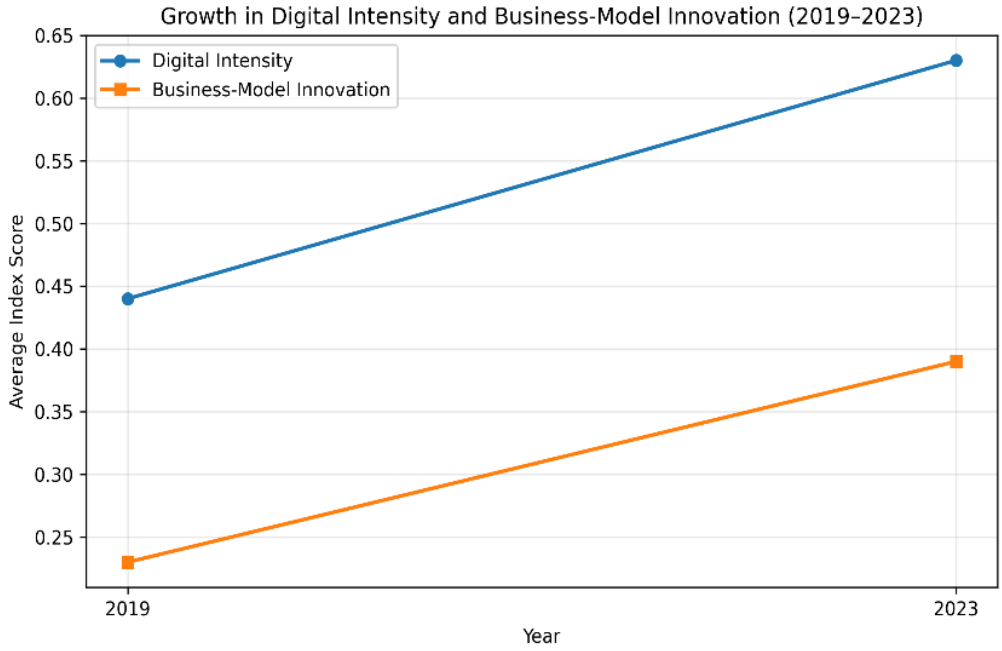


Fig. 3: Growth in Digital Intensity and Business-Model Innovation (2019–2023)

Fig.3 presents the comparative growth in digital intensity and business-model innovation between 2019 and 2023. The average digital intensity score increased from 0.44 in 2019 to 0.63 in 2023, indicating greater adoption of digital technologies across business environments. Similarly, the business-model innovation index improved from 0.23 to 0.39 during the same period. The simultaneous increase in both indicators suggests a positive association between digital advancement and business-model innovation. The observed trend highlights the growing importance of digital capabilities in transforming business operations, improving value creation mechanisms, and supporting innovative business practices. However, institutional differences may influence the magnitude of these improvements.

Conclusion

This paper explored the effects of digital transformation on business models in emerging economies and the impact of institutional infrastructure on this effect. There are four significant findings. The path to digital transformation lags from two years behind the business-model innovations. The impact is highly sensitive to institutions, with it being small (or negative) when institutions are lower than 0.30 and rising to 0.25 when institutions are higher than 0.75. Most predictive importance is from institutional features, bringing precision in predicting firm viability up from 79.5 to 88.3 percent. The digital transition percolates through industries, with logistics and retail as hubs.

There are several limitations that must be taken into account regarding the interpretation of the results provided by the study. The first limitation is connected with the fact that the research is based on artificial data; as a result, the values of the variables under consideration are affected by the experiment setup and not by the economic realities. Moreover, it is assumed that the structure of the linkage remains constant, and the institutional infrastructure is measured via one integrated variable. It should be noted that the suggested models provide only statistical links, and not the causality in real market economies. Future research should take these limitations into account and develop an integrated Information and Communication Technology (ICT) development index, investigate institutional variables independently, introduce time lags for sectors and analyze them according to the differences in ICT adoption outcomes.

These modifications will increase the framework's reliability, applicability, and generalizability within various economic settings. The key point here is that digital transformation cannot be viewed as an independent success strategy, because its efficiency will depend on the existence of certain institutions, technologies, and infrastructure. Hence, the development of business model innovation becomes sustainable only through the joint development of institutional and technical factors.

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