



Data-Driven Dominance and Stakeholders' Vulnerability: An Empirical Assessment of Anti-Competitive Practices on Indian E-Commerce Platforms

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Abstract: India's digital economy is doing great and today all the ecommerce players are big data-driven industry who have raised significant questions pertaining to market leaders, competition and welfare of stakeholders. This research is an empirical study on Data driven Dominance and Stakeholders' Vulnerability with reference to Indian E-commerce Companies. A mixed method research design was followed, which included filling the survey for 600 respondents (300 for online sellers and 300 for consumers), observations of the platforms like Amazon, Flipkart, Meesho and JioMart, and doctrinal research of Indian and foreign competition laws. A methodology known as Structural Equation Modelling (SEM) was applied to evaluate the interconnections between the data accumulation, network effects, platform integration, algorithmic opacity and vulnerabilities of the various stakeholders: data-driven dominance. Results indicate that data can drive data-driven dominance, which may end up having a significant impact because of the accumulation of data and network effects, both sellers and consumers become data platforms that are more prone to exploitation in terms of potential. The severity of negative effects of platform dominance was seen to be reduced by regulatory effectiveness. The study offers an integrated empirical framework at the intersection of platform economics, stakeholder theory and the data advantage theory, and proposes policy solutions of regulating the platform economy ex ante, requiring transparency of algorithms, the establishment of a digital market unit in India, subjecting platform companies to the definition of gatekeepers, and specially, the set up and compulsory delegation of interoperability.

Keywords: Data-driven dominance, Digital platforms, E-commerce, Competition law, Stakeholder vulnerability, Algorithmic governance

1. Introduction

1.1 Evolution of India's Digital Economy

In India, the rate of Internetization, smart phone adoption and the maturing of the digital payment system, coupled with the enabling measures of Government policies such as Digital India has wrought havoc on the Indian digital economy over the last ten years. These advances have further boosted the platform-based business models and triggered making E-commerce as one of the most rapidly expanding sector of India. But now, many digital platforms such as Amazon, Flipkart, Meesho and JioMart have emerged as multi-sided markets, that involve all the elements of the market including consumers, sellers, logistics from logistics service providers, the ad industry and the finance industry. With the growth of these platforms, massive amount of behavioural, transactional and commercial data are created, turning data from a mere operational resource to a strategic economic asset (Fast, 2021; Gawer, 2024; Hu, 2023).



The ones that are seeing the sources of competitive advantage change as the data economy becomes a reality are the winners. Network effects, ecosystem integration and data analytics are all becoming a factor after the competition, and can be said to replace the “traditional” price competition. This centralisation generates a huge competitive edge to the big platforms, and dependence to businesses and consumers in these platforms (Jakhu, 2025; Larsson, 2021).

1.2 Data as the New Source of Market Power

They are important aspects of market power; big data, artificial intelligence (AI), machine learning algorithms and integration into ecosystems; in digital markets. These platforms constantly collect user data and purchase patterns, search patterns or combinations, and transaction data, which can be used to generate information to aid in the improvement of their recommendation systems, tailored advertising, price optimization and operational efficiency. The use of these capabilities gives rise to the “network effect” in which the more people that use a platform, the more data are generated to further fortify the platform's influence (Hu, 2023; Fast, 2021).

AI and algorithmic decision-making has additionally remodeled competition by impacting item rankings, look exposure, intended advancements, and buyer acquiring choices. Before, it was the market solution (only good product quality & price), now the platforms are using Proprietary Algorithm, which is creating market results and creating dependence on platform in the ecosystem. Thus, the existence of a digital infrastructure and algorithmic governance by a power position has been replaced by a market power in the form of controller of the data and the digital infrastructure (Wibowo, 2025; Ong, 2023). It has brought about more and more debate in the scholarly world on the link between rule of data, rivalry plan and management intrusion.

1.3 Problem Statement

Traditional competition law was invented to tackle anti-competitive conduct based upon indicators such as the level of market shares, pricing behaviour and consumer welfare. Yet, conventional formulas are less and less appropriate to an environment where they can be dominated by the concentration of private data, network and externalities, opacity of algorithms, and embeddedness in ecosystems and platforms. Measures like self-preferencing, ‘algorithmic discrimination’, exclusive deals and data discriminatory practices can render the market less contestable, not necessarily with an immediate price hike. However, it can be challenging to identify exclusionary behaviour in the current legal landscape, and even more challenging to act on it: once exclusionary conduct occurs, it can be hard to repair the damage it causes to competition (Larsson, 2021; Wibowo, 2025).

1.4 Research Gap

The three fields of the competition law, data governance and consumer protection have already been sufficiently explored in the literature of related subjects. Much of the research on digital markets' power dynamics has been conducted separately from privacy law and policy making, algorithmic governance, and antitrust enforcement, and even less empirical studies have focused on considering all three of these factors. (Fast, 2021; Helberger, 2021; Gawer, 2024). Apart from this, there is a lack of empirical evidence regarding the effect of data-driven ‘dominance’, if at all, on various stakeholders including sellers, users, third stream vendors in the Indian e-commerce industry. In this regard, this research is an endeavour to delve into this lacuna using an empirical and comparative legal analysis for governmental evaluation of the vulnerable status of the stake holders in face of the dominance of digital platforms.

1.5 Research Objectives

The study seeks to:

- i. Define the most effective aspects of data-driven supremacy in Indian ecommerce websites.
- ii. Discuss prominent anti-competitive practices by the big online companies.
- iii. Assess vulnerabilities of stakeholders – sellers and consumers.
- iv. Look at the existing regulatory framework and make an assessment on their adequacy for the India.
- v. Make policy recommendations with regard to fair and competitive markets in the digital field.

1.6 Research Questions

RQ1: What are some of the reasons that makes data to be the king of eCommerce platforms in India?

RQ2: What are the typical abuses of dominant/monopoly positions in platform-based digital markets?

RQ3: What do the data-based markers of dominance and vulnerability of stakeholders imply?

RQ4: Is there a need to have a better legal structure in India to deal with dominance of digital platforms?

RQ5: What are some of the regulatory remedies or changes needed to increase competition and also protect consumers in digital markets?

1.7 Research Hypotheses

H1: Data compilation has a positive impact on data-driven dominance.

H2: Integration in the platform is positively associated with the data-based supremacy.

H3: Dominance based on data is positively linked to network effects.

H4: There is a positive relationship between algorithmic opacity and stakeholder vulnerability.

H5: Data driven Dominance positively impacts Seller and Consumer Vulnerability.

H6: The effectiveness of regulation negatively moderates the relationship between data-driven dominance and vulnerabilities of stakeholders.

2. Literature Review

Theme 1: Platform Economics

The digital platforms are rapidly reshaping the traditional forms of the markets by connecting several entities and groups, like consumers, advertisers, sellers, logistic providers and entities that provide complementary service – simultaneously. Digital companies do not consist merely of production like the classic companies, but take a different approach to creating value: by enabling multi-party interactions, and constantly learning from these interactions. Thus, owning physical assets is no longer a key to gaining competitive edge, but the control of digital infrastructure, user network, and the flow of information, as a platform economics enables it. Similarly, Hu et al. (2023) claim that data is an important way to make a service competitive, highlighting how data could be a key solution that can contribute to enhancing operational efficiency, customer interactions, and the competitiveness of the ecosystem.

The studies additionally show that the expansion of platforms generates huge obstacles to entry as larger platforms sustain their competitive edge constantly by way of scale, network results and information hoarding. According to Fast et al. (2021), the value of digital platforms for businesses is not just their size (number of users) but that of the processing capability to turn the behavioural data into intelligence that can be converted into value for commerce. As a result, platform economics and data governance, as well as platform economics and competition policy now go hand in hand.

Theme 2: Data as Market Power

Data has come to be among the greatest strategic assets in the Digital Economy. The data, however, is continuously being updated as businesses manage multiple interactions in this environment and will help them to improve their recommendation engines, pricing models, ad optimisation and product development. According to Fast et al., (2021), the more data is collected at a “consumer level”, the more it reinforces the other business's competitive advantage making it difficult for traditional competitors to duplicate.

Furthermore, Jakhu and Chowdhury (2025) identify that endogenous data collection brings about better welfare for the platform, but there will be a subsequent issue of competition and privacy. Similarly, Gupta et al. 2021 assert that the significant ability to process the extensive big data trends greatly aided the company in its performance while using market intelligence when handling with the customer's analysis. Similarly, Behl et al. (2022) find that big data analytics capabilities are a significant factor of sustainable competitive advantage especially of technology companies. In all of the examined works, it is evident that data is a method of control for the market, and not merely, its use is as a means to operate a business.

Theme 3: Network Effects

So a defining feature of digital platform markets is that of networks. When it comes to the network effects, they can be positive, meaning that more people on the platform, attracts more value to that same platform. A user base brings in more sellers and further sellers' additions bring in more consumers, and so forth. These indirect impacts can also explain the growth of the platforms' power, particularly in less advanced economies, where digital infrastructure is mushrooming (Gawer and Bonina, 2024).

Hu et al. (2023) also shows that the network effects enhance the performance of the platform, in terms of improving the effectiveness of transactions and service innovation. But, the impact of strong network effects can at the same time lead to a lower contestability of the market, which hinders customers from shifting to alternative networks. So, network effects aren't only an economic efficiency, but also a market mutagenesis phenomenon. Accordingly the network effects result in economic efficiency, and are a factor of market mutagenesis.

Theme 4: Algorithmic Governance

Sorting and ranking content, personalized recommendations, dynamic pricing, ad insertion and visibility of products in digital companies also happens more and more often with the use of AI. Algo now not only influence the commercial opportunities that the sellers are getting but likewise the purchasing behaviour of their consumer. Rana et al., (2021) demonstrate that AI models have a great impact on organisation competitiveness as well as operational inefficiency and ethical issues.

AI-driven organizational cultures and practices with improved access to data can increase innovation into an organization, while the capacity for transparency and accountability must be further strengthened and enhanced via improved and robust governance mechanisms as suggested by Chaudhuri et al. (2024). This is why transparency issues with algorithms have a great deal to do with regulation: the stakeholders don't always know how commercial decisions are taken or prioritised, in a first place.

Theme 5: Self-Preferencing

Among these more controversial anti-competitive practices in the markets for digital platforms is self preference. Examples of using the dominant platforms include increasing the price of one product or products and increasing visibility to users through keywords or algorithms in search engines in order to prioritize one product or products of the platform or its "partner" retailers, shipping services or even advertising solutions. In recent years, digital dominance has been often expressed not necessarily in the form of "standard" pricing behaviour but by the control of ecosystems, making it even more challenging to spot self-preferencing with the "classic" approaches to competition law.

Similarly, Wibowo et al. (2025) argue that current antitrust regimes are in need of significant changes, given the growing importance and ability of platform operators to shape competition via algorithmic governance, rather than by engaging in exclusionary conduct. In addition to being hard to put in place under traditional constructs of abuse of dominance, such practices can have the effect of altering the competitive neutrality.

Theme 6: Digital Vulnerability

Meanwhile, vulnerabilities of new stakeholders have emerged in these 'platform' environments. Helberger (2021) addresses the concept of 'digital vulnerability', the codes of algorithmic systems and their effect on the autonomy of individual consumers, including the customisation of recommendation systems or pictorial systems of ranking and behaviour targeting. Thus customers can be drawn to the purchase of products, and confronted by intentionally created environment algorithms.

The businesses are becoming familiar with being more reliant on data, notably that third party sellers and SMEs still continue to be targets. Overall, the films Saura (2021) highlight how indexing and other digital marketing methods driven by these data ultimately lead to SME competitiveness and effectively using only one of the platforms' infrastructure could lead to SME's bargaining power reduction. However, morepje (2024) suggests that there are also market opportunities for smaller companies that have their digital ecosystems and also dependency structures that need to be addressed when using e-commerce platforms.

Theme 7: Competition Law

Conventionally, competition law debate and analysis has been focused on three arguments: around the question of “market share”, “pricing” and “consumer welfare”. But these traditional analytical frameworks face more and more challenges in times of digital platform markets, as competition effects often manifest through platforms accumulating data, virtually binding their ecosystems, and steering them with algorithms, but not necessarily through higher pricing. To effectively face trust, data concentration and digital market power, centralized product markets, dynamic markets, concentration trends, and sectorial characteristics, among others, challenge traditional notions of antitrust rules, and competition authorities are thus compelled to give a second thought to the mechanisms of antitrust rules, as argued by Larsson (2021).

Instead, Wibowo et al. (2025) call for a reinvigorated antitrust law that can properly deal with platform economies with AI, including imposing more stringent obligations on AI platforms, improving transparency of AI and algorithms, and increasing the oversight of digital gatekeepers. As mentioned by Gawer and Bonina (2024) pro-activity in the form of regulation are also suggested for the dominant platforms that operate in developing economies such as looking up to maintain market contestability and foster innovation.

Research Gap

There is a high level of development in these areas as seen through the literature: Digital platforms, Data governance, AI and competition policy. But three major parts remain; they're aspects that still need to be fleshed out. First, the studies give only an isolated perspective to commerce and competition law, as well as consumer protection and data governance of the platforms; it is not a stakeholder specific perspective. Second, few empirical studies assess the impacts of data-driven dominance to both sellers and consumers as well as vendor and logistics partners in the eCommerce ecosystem in India. Third, scholarship on the topic of smart jurisdictions is mostly based in developed jurisdictions, with there being a relatively small amount of empirical research about India's burgeoning digital economy.

The present study extends this knowledge and develops an integrated, empirical matrix which brings together the question of data accumulation with the questions of platform integration, network effects, algorithmic opacity and regulatory effectiveness and correlates them with the vulnerability of different stakeholders. The study aims to fill the lacuna in the digital competition law and platform governance literature using the amalgamation of evidence from surveys, platforms and comparative legal analysis.

Table 2.1: Summary of Literature and Research Gap

Theme	Key Findings from Literature	Identified Research Gap
Platform Economics	Digital platforms create value through ecosystem participation and data accumulation.	Limited empirical evidence from Indian e-commerce platforms.
Data as Market Power	Big data has become a strategic source of competitive advantage.	Few studies quantify its impact on stakeholder vulnerability.
Network Effects	Positive network effects reinforce platform dominance.	Limited integration with competition law analysis.
Algorithmic Governance	AI influences ranking, recommendations and pricing decisions.	Insufficient empirical assessment of algorithmic opacity.
Self-Preferencing	Platform-controlled rankings may distort competitive neutrality.	Limited comparative analysis across Indian platforms.
Digital Vulnerability	Consumers and SMEs increasingly depend on platform ecosystems.	Multi-stakeholder vulnerability remains underexplored.
Competition Law	Traditional antitrust frameworks inadequately address digital markets.	Need for integrated empirical evaluation of regulatory effectiveness.
Overall Gap	Existing studies remain fragmented across disciplines.	Need for a mixed-method empirical assessment linking platform practices, stakeholder vulnerability and regulatory reforms in India.

3. Theoretical Foundation and Conceptual Framework

3.1 Platform Economics Theory

The Platform Economics Theory builds a detailed picture of the digital market's structure with the help of multi-sided platforms acting as a vehicle through which to connect to consumers, sellers and advertisers, logistics providers and other complementary service providers. The concept is different from “pipes”-type value for which value extraction is from production and distributing, to “digital” value where value is created via economical effects from digital transactions and economies of scale. Platforms such as cloud computing, digital payment, fulfilment and recommendation systems, among others, are increasingly part of them, and help drive the participation of the 'ecosystem' and indefinitely or perpetually expand the information benefit.

A recent study suggests that competitiveness of a digital platform is increasingly reliant on technological capacities, rather than on the old-fashioned provider of production efficiencies. Cano et al. (2022) observed that despite the market place context, it is noted that a market place is no longer a market but rather an environment for innovation, that is driven by digital infrastructure, information sharing and collaboration of ecosystem actors. Likewise, Lee (2022) discovered that using cutting-edge analytics, businesses can boost their supply chain coordination and effectiveness, optimize inventory, logistics, and customer service. Bag et al. (2023) also stated that integrating the big data technologies in the platform ecosystem enhances sustainability and the organisational resilience aspects. The views imply that platform economy is not just a question of a mere transaction, it is an integrated digital economy which has the potential of generating substantial volumes of market power.

3.2 Network Effect Theory

The Network Effect Theory states that the more players that join the network, the more useful it becomes and more value it provides. Increased access to the marketplace for the sellers will include increased participation from sell-side and bring more consumers to the platform. All of this drive back-reinforcement of platforms, concentration of the market and difficulty of entry for other platforms.

A major advantage of Digital platform ecosystems is that it can improve its supply chain resilience dramatically by boosting the degree of connectivity between the various market actors as pointed out by Zhang et al. (2021). Conversely, the interdependence can contribute to increasing dependence on a dominant platform(platforms). Similarly, Cano et al. (2022) found that network involvement helps to directly facilitate innovation diffusion and competitiveness of the platforms. In addition, coordination between the entities in the ecosystem and thus the indirect network effects are boosted through digital integration of the supply chain supported by data analytics, as Lee (2022) mentioned. Thus, bigger platforms grow in size due to their increasing consumer and seller attraction offer increased benefits that are difficult to replicate on smaller platforms.

One of the major forces to solidify the marketplace power of the platform and acquire more customer and surpass greater dependency on the platforms is described as the network effects in this research.

3.3 Data Advantage Theory

Data Advantage Theory states that firms that have the better data will reap the advantages of better decision making, forecasting and targeted delivery of services, and will do so in a competitive and sustainable manner. Unlike conventional economic resources, the value of data is greater with the more you use it and the more that mounts up.

Gupta et al. (2021) based on the results of the study, revealed that there exists a direct positive relationship between big data capability and marketing performance as companies with a growing big data capability are likely to possess higher marketing performance reflected in better customer intelligence and strategic decision making processes. However, for the transition to digital supply chains with the use of advanced analytics, forecasting, operations and resource planning is highlighted to reduce forecasting error, improve operational efficiency and optimize resources, as indicated by Lee (2022). Bag et al. (2023) also claimed that the ability of big data enhances the sustainability in organisations as they enable evidence-based decisions for management.

Leveraging past consumer choices, companies can fine-tune their recommendation systems, customize ads for each consumer, dynamically price discriminate and enhance customer retention - all for the benefit of digital platforms. These capabilities are growing and with them, data becomes a strategic asset with the ability to create more competitive advantages than just the traditional “economies of scale”. So, a data-driven dominance in the proposed conceptual model will be enhanced by the accumulation of data, the opacity of algorithms and the integration of platforms.

3.4 Stakeholders' Theory

The concept of stakeholders' theory is that the organizations should create value not just "for the shareholder" but "for all the stakeholders". Consumers, sellers, logistics providers, technology partners and regulators, advertisers and society are the key players in a digital platform ecosystem. The governance decisions for Platforms thus have consequences to the universe beyond the organisations involved.

The use of digital marketing strategies is becoming increasingly a competitive factor for SMEs and they are becoming reliant on the dominant digital platforms, it has been observed in his/her study 'Saura (2021). A study by Morepje (2024) also revealed that the small business sector is dependent on the e-commerce platforms that provide opportunities to the businesses. Moreover, Morič has declared that the evolution of e-commerce is accelerating, and so there is a need for a higher level of safeguarding of personal data, since the risk of privacy loss, as well as a information asymmetry, is growing, in the case of e-commerce.

The studies all point towards an opportunity and a vulnerability of stakeholders being created at the same time with digital platforms. Thus, in this light, Stakeholder Theory is the underpinning theory that can reveal the effects of data-based dominance on the vulnerability of sellers' and consumers' in the digital marketplace in India.

3.5 Competition Law Theory

The primary goal of Competition Law Theory is to preserve and/or protect the very market structure, by responding to the prevention of anti-competitive agreements, exclusionary conduct/abuse of dominance. The traditional analysis of competition has focussed on the effect of competition on price, market shares and consumer welfare. But assumptions such as these are increasingly being put under the magnifying glass in the digital markets, where the competitive advantage doesn't necessarily count, but the technology and the ability to actually have a competitive advantage is what really matters: to aggregate the data and use algorithms to govern it.

Wibowo et al. (2025) propose that digital antitrust policies make a leap towards regulation of the AI-powered platform economies using ex ante obligations, interoperability and transparency of algorithms. According to Ong (2023), the market power through the control of ecosystems is becoming increasingly prevalent in the digital platforms and classical tools of competition are not enough to identify anti-competitive practices. The use of AI-powered monitoring is also becoming an important mechanism for the identification of novel competition issues in the field of digital commerce, as explained by Mutemi (2024), while also a convergence between competition law and the personal data market is observed, as explained by Morič (2024).

In terms of competition theory, the Competition Law Theory, would accept the need for more comprehensive regulatory initiatives when it comes to the modernization of power with data and the prevention of end users to become victims to algorithmically-assisted anti-competitive practices.

3.6 Proposed Conceptual Model

Of the above mentioned theoretical approaches, the current study has developed an integrated conceptual model and by synthesising the theories explains the ramifications and the genesis of the data dominance in the Indian e-commerce.

In the framework, the following independent factors influencing the competitive position of digital platform are considered: Data Accumulation, Network Effects, Algorithmic Opacity, Platform Integration and Switching Costs. Data creates greater predictive ability and customer intelligence, network effects make standing out of the herd more difficult, platform integration allows a platform to exert even more influence over complementary services, there is an element of algorithmic "black box" to which increases information asymmetry between the platform and the customers, and switching costs prevent customers from leaving the platform.

These characteristics of the platform are called together in relation to Data-driven Dominance, as the mediating variable. The more platforms accrue data assets and the stronger they are in the market and connect with consumers, the more roles they play in access to the market, consumer visibility, consumer behavioural, price and commercial operations roles.

Those effects are factored into the dependent variables - the latter being Seller Vulnerability, and the former, Consumer Vulnerability. Sellers may become more dependent and lose negotiating leverage, less likely to be well informed about algorithms, and could be forced to leave, while buyers could experience choice architecture, information asymmetry, loss of transparency, and price disparities.

Finally Regulatory Effectiveness is introduced as the moderating variable. This means, a clear legal regulation of competition enforcement, strong data protection laws and required accountability for algorithms and digital governance in general, should reduce the negative dynamics of a data-driven dominance of the stakeholders and the accompanying vulnerability. In that it brings together in one empirical model economic theory, stakeholders' perspectives, data dominance and competition law and is capable in explaining the dynamics of today's digital markets.

Figure 1. Proposed Conceptual Framework

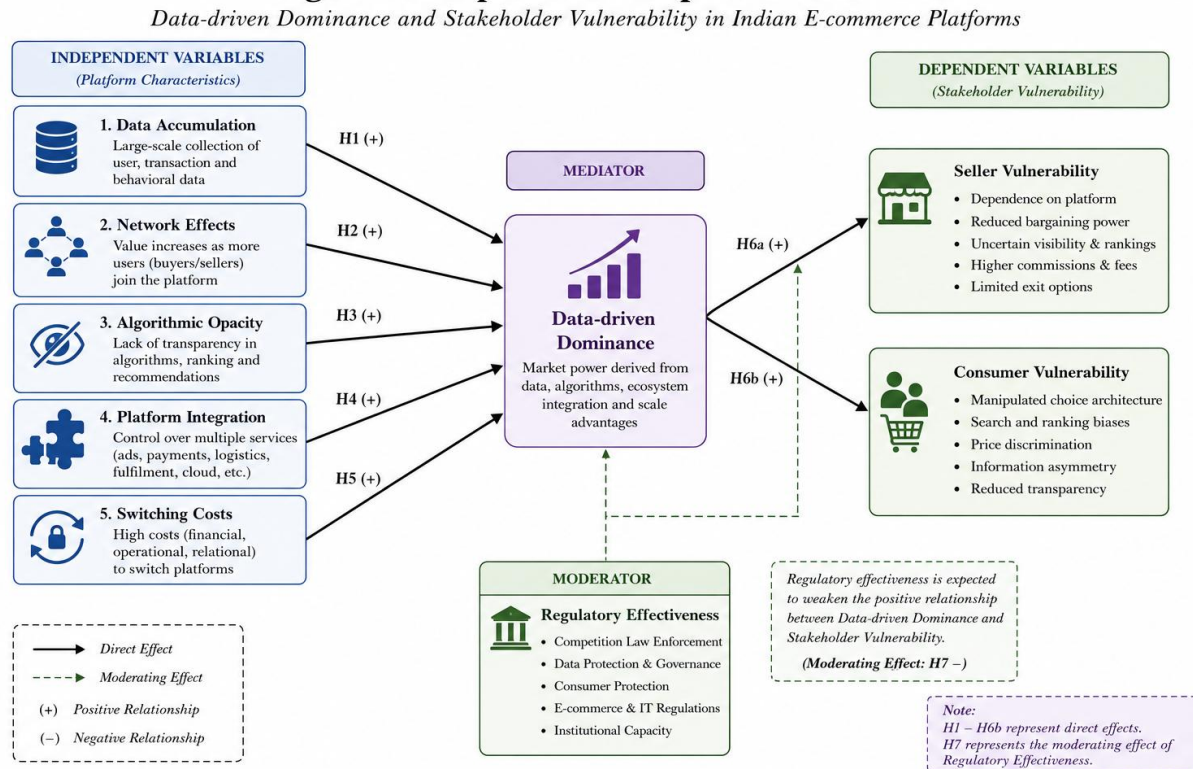


Figure 1: Proposed Conceptual Framework

4. Research Methodology

4.1 Research Philosophy

This study adopts an empirical analysis based on Positivist approach and investigates association of Data based Dominance, Anti-competitive practices and Vulnerability of Stakeholders in Digital marketplace in India. By Positivism, it is assumed that the social phenomena can be observed objectively, in a systematic way with the help of quantitative data and statistical analysis. As a theoretical approach, the positivist paradigm is used in this study in order to examine measurable association in the platform, market power and its implications on platform stakeholders. It could be used to frame hypotheses consistent with literature and to test the hypotheses using a variety of available statistical procedures, in a empirical manner. Furthermore, with positivist approach, the findings will be more objective, reliable and can be general applicable because the research is rejected to do the research based on the bias of the researcher and only on the basis of evidence in drawing conclusion.

4.2 Research Design

The research design is a blend of quantitative and qualitative; this study adopts this qualitative and quantitative approach which gives both quantitative and qualitative view to the data-driven dominance in E-commerce platforms in Indian set up. The quantitative part consists of structured questionnaires, questionnaires are given to the sellers and consumers, and perceptions with respect to the platform conduction, algorithmic governance, switching costs, and stakeholder vulnerability are measured. These are complemented by the qualitative aspect as witnessed via a systematic observation of its platform and analysis of its doctrinal laws.

Platform observation involves observing specific product launches, as well as the frequency and direction of search ranking, sponsored products, or visibility of affiliated sellers, package and pricing changes and delivery assurances that happen across the top eCommerce platforms within a specific period of time. Alongside the doctrinal analysis, the appraise current legal and regulatory landscape in India as per the statutory provisions, the orders passed by the Competition Commission of India (CCI) and the judgments by the courts. Adopting the 3 methods hereby results in methodological triangulation, which boosts the credibility and validity of the answers got from the research.

4.3 Population of the Study

They have identified 4 significant stakeholders to the Indian e-commerce. The former are online retailers of such big platforms as Amazon, Flipkart, Meesho, Myntra and JioMart. The sellers are from micro, small and medium enterprises (MSMEs) and individual merchants with majority of their businesses being conducted on digital platforms.

The second group are those consumers in India who are known as 'converted e-shoppers' and who shop online. Consumer vulnerability can be reflected in consumers' perception when they encounter the algorithms directly; when they are put forward personalised recommendations, but also relates to the way retailers are priced, and how platforms are governed.

The third population consists of the experts in the field of competition law, including legal practitioners, academics and researchers with a focus on digital competition law and platform regulation. Finally, experts from agricultural economics, ex-advisors from the Competition Commission of India (CCI), as well as public policy experts from who share their knowledge and proficiency on understanding the challenges of enforcement and effectiveness of regulatory frameworks in digital markets.

Table 4.1: Target Population and Sampling Design

Stakeholders' Group	Target Population	Sampling Technique	Sample Size
Online Sellers	Sellers operating on Amazon, Flipkart, Meesho, Myntra and JioMart	Purposive Sampling	300
Consumers	Indian online shoppers	Purposive Sampling	300
Legal & Policy Experts	Competition lawyers, CCI professionals and policy experts	Expert Sampling	15–20
Total Survey Respondents	Sellers + Consumers	—	600

4.4 Sampling Technique

A purposive sampling technique is performed to make sure that the respondents have sufficient know-how as well as the practical experience of the digital marketplace. There is a quantitative sample of 300 respondents online sellers and 300 online consumers. This sample size is regarded as adequate to carry out multiple statistical analyses such as Structural Equation Modelling (SEM).

Additionally, expert interviews with 15-20 competition law experts, experts from policy research and members of CC of India are conducted. The interviews provide some context about the governance, enforcement and new issues around platform regulation. The application of quantitative surveys and then validation quantitatively and by qualitative explanation in form of communication with experts enable performing quantification and qualitative validation on the obtained results from surveys.

4.5 Data Collection Methods

This study uses both primary and secondary sources to in-depth explore anti-competitive practices under the Indian e-commerce market.

Structured questionnaire that contains five point Likert "Strongly Disagree," "Disagree," "Neither Disagree or Agree," "Agree" and "Strongly Agree" were used to collect the data and these data were considered as primary data. These attitudes are data aggregation, transparency of the algorithms, integration of the platform, switching costs, market fairness and vulnerability of the actors involved, which are the bases of the questionnaire.

Other than conducting surveys, platform observation is also performed wherein our team tracks 30 days trend and behavior of approximately 100 products in each platform across the various product categories such as Amazon, Flipkart, Meesho, Myntra, and JioMart. These include product rankings, products pricing, delivery assurances, associated seller status and sponsored products as well as products promotion discounts. Based on these observations, some common cases of preferential treatment based on seller affiliation, algorithmic ranking bias and self-preferencing may be identified.

Secondary data covers analysis of laws and regulations, including Ethiopian Supreme Court decisions, the Competition Commission of India (CCI) decisions and orders and Competition Act, 2002 (Competition law), Ethiopian Digital Personal Data Protection Act, 2023 and the Ethiopian Consumer Protection (E-Commerce) Rules, 2021 and major international laws and regulations such as EU Digital Markets Act, 2022 and EU Digital Services Act, 2022.

Table 4.2: Data Collection Framework

Data Source	Information Collected	Purpose
Structured Survey	Perceptions regarding platform conduct, switching costs, algorithmic opacity and market fairness	Quantitative hypothesis testing
Platform Observation	Search rankings, prices, discounts, sponsored listings, delivery promises and affiliated seller visibility	Identification of anti-competitive practices
Expert Interviews	Enforcement challenges, regulatory effectiveness and policy recommendations	Contextual interpretation of findings
Legal Documents	CCI orders, court judgments, DPDP Act, Consumer Protection Rules and international regulations	Doctrinal and comparative legal analysis

4.6 Research Variables

To capture different dimensions of digital market power and outcomes of the different stakeholders' conceptual framework includes multiple latent variables.

Independent variables: Digital platforms collect information, connect to the platform, have network effects, are opaque in terms of algorithms, and are subject to some switching costs. The mechanism, which explains the impact of these platform aspects on the stakeholder's situation, is the data-driven dominance. The dependent variable is dependent seller and dependent consumer (sellers are at risk, so are consumers) as a consequence of diminishing bargaining power, consumers' choice and information asymmetry. To measure floor, the moderating variable is the regulatory effectiveness, which includes the strength of competition enforcement and digital governance to test whether the impact is moderated by strengthening of competition enforcement and digital governance.

4.7 Statistical Analysis

IBM SPSS Statistics and AMOS will be used in analysing the collected data. Data screening, coding, missing value treatment and description profiling of respondents are preliminary items of analysis.

Cronbach's Alpha will be used to determine the reliability of the measurement scales and the Kaiser-Meyer-Olkin (KMO) Measure and Bartlett's Test of Sphericity will be used to check the sampling adequacy. To determine the underlying factor structure, Exploratory Factor Analysis (EFA) will be carried out followed by CFA to validate the measurement model. The Average Variance Extracted (AVE) and Composite Reliability (CR) will be employed to measure the convergent validity while Fornell-Larcker criterion will be performed to measure the discriminant validity.

The descriptive statistics, Pearson's correlation analysis and multiple regression analysis will then be used to analyse the relationships between the variables in the study. Finally, the conceptual framework and hypotheses will be tested by using Structural Equation Modelling (SEM) technique. Data-driven dominance will be analysed as a mediator between platform characteristics and stakeholders' vulnerability and whether regulatory effectiveness has a moderating effect on the potentially negative results of data-driven dominance on sellers and consumers.

Table 4.3: Research Variables and Statistical Techniques

Construct	Variable Type	Statistical Technique
Data Accumulation	Independent	EFA, CFA, SEM
Platform Integration	Independent	Correlation, Regression, SEM
Network Effects	Independent	Regression, SEM
Algorithmic Opacity	Independent	Regression, SEM
Switching Costs	Independent	Correlation, Regression
Data-driven Dominance	Mediating	Mediation Analysis, SEM
Seller Vulnerability	Dependent	Regression, SEM
Consumer Vulnerability	Dependent	Regression, SEM
Regulatory Effectiveness	Moderating	Moderation Analysis (SEM)
Measurement Model	—	Cronbach's Alpha, KMO, Bartlett's Test, AVE, Composite Reliability and CFA

5. Empirical Findings

The results from the survey of 600 respondents (300 online sellers and 300 online consumers) as well as platform observation and statistical analysis are presented in this chapter. Descriptive statistics, correlation analysis and regression analysis were performed then reliability and validity were assessed, followed by the presentation of respondents' demographics, Structural Equation Modelling (SEM), mediation and moderation analyses, and hypotheses testing.

5.1 Respondent Profile

The final number of the respondents were 600 valid responses. Of the respondents, both online sellers as well as consumers were represented equally, both at 50%. The majority of the respondents were in the economically productive age group of 26-45 years as it is the main age group in India's Digital marketplace. Among the respondents some of the major players like Amazon and Flipkart were dominating along with other market players such as Myntra, Meesho and JioMart.

Table 5.1: Demographic Profile of Respondents (N = 600)

Variable	Category	Frequency	Percentage
Stakeholder	Sellers	300	50.0
	Consumers	300	50.0
Gender	Male	306	51.0
	Female	294	49.0
Age	21-30 Years	184	30.7
	31-40 Years	212	35.3
	41-55 Years	204	34.0
Major Platforms	Amazon, Flipkart, Meesho, Myntra, JioMart	600	100

Figure 5.1. Respondent Demographic Distribution

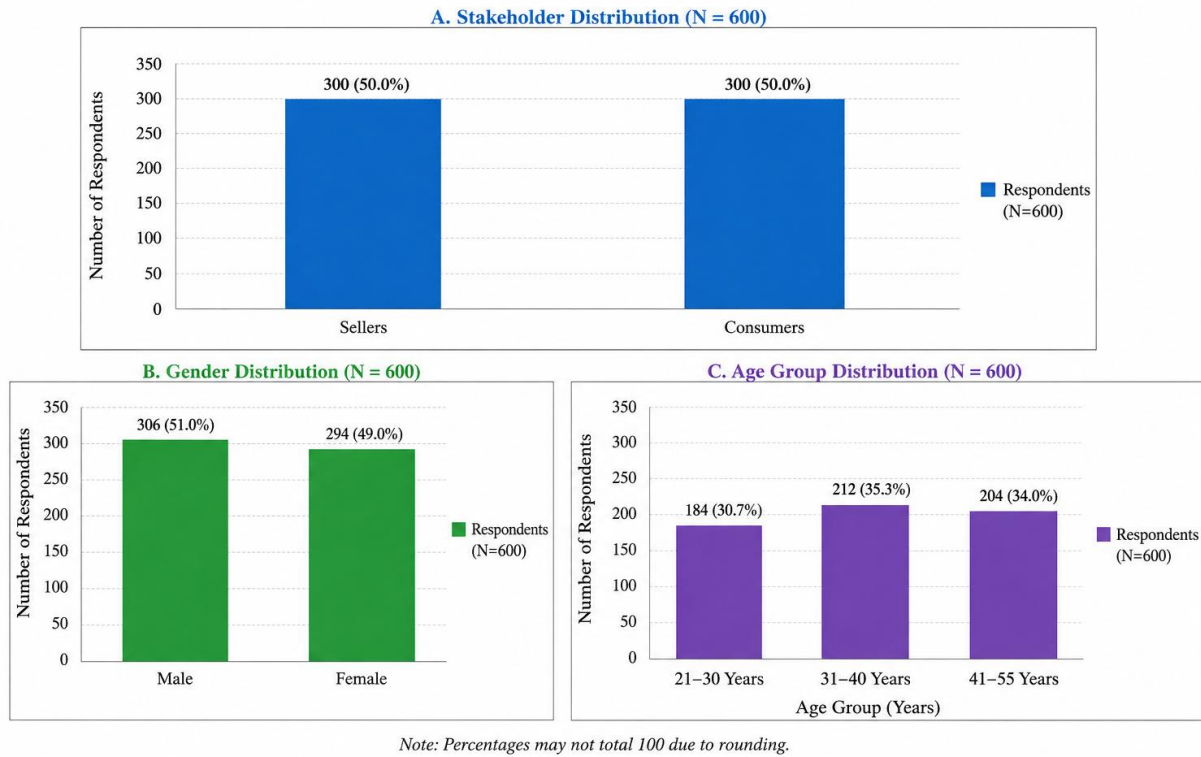


Figure 5.1: Respondent Demographic Distribution

5.2 Reliability Analysis

Cronbach's Alpha was used to check the reliability of all the measures. All constructs had a satisfactory internal consistency with values of > 0.70 . Data-driven Dominance had the best reliability and Regulatory Effectiveness had good reliability.

Table 5.2: Reliability Statistics

Construct	Cronbach's Alpha
Data Accumulation	0.88
Platform Integration	0.86
Network Effects	0.89
Algorithmic Opacity	0.87
Switching Costs	0.84
Data-driven Dominance	0.92
Seller Vulnerability	0.90
Consumer Vulnerability	0.88
Regulatory Effectiveness	0.85

Results indicate good internal consistency of all constructs allowing them to be used for the subsequent multivariate analysis.

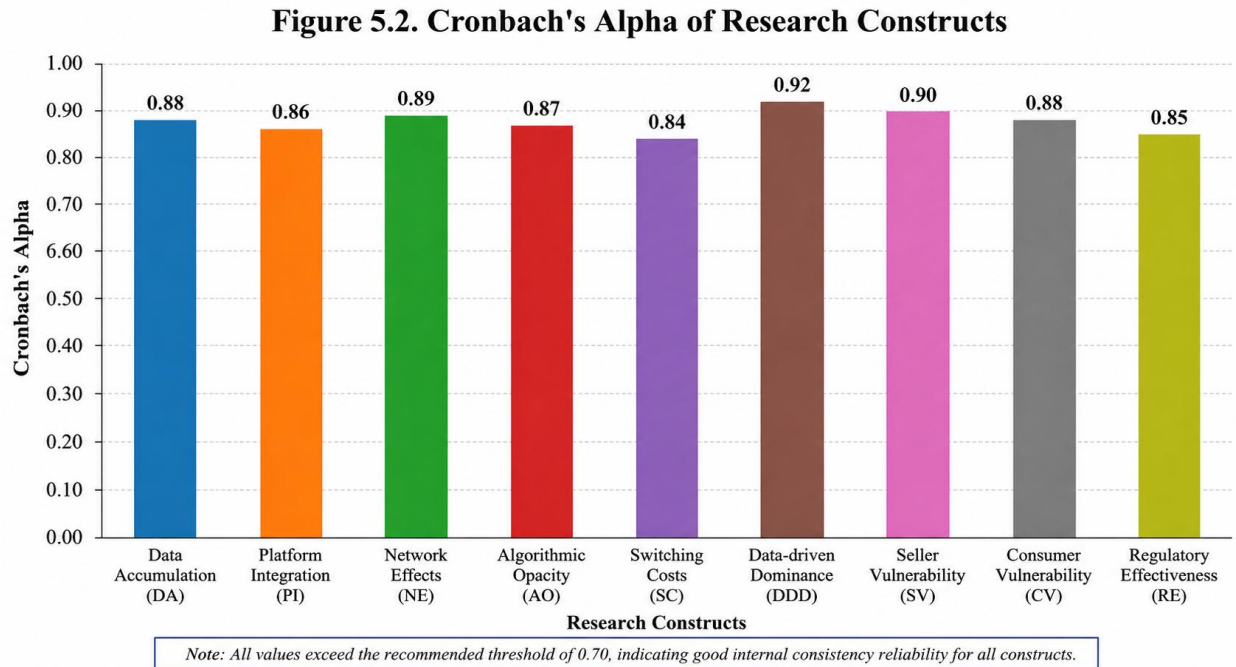


Figure 5.2: Cronbach's Alpha of Research Constructs

5.3 Validity Analysis

The confirmation of the construct was done by KMO, Bartlett's Test and Confirmatory Factor Analysis. The KMO value was 0.91, the value was excellent for the sampling adequacy and the value of Bartlett's test of Sphericity was statistically significant ($p < 0.001$), which meant that it was suitable for factor analysis. All the constructs presented Average Variance Extracted (AVE) values that are higher than 0.50 and all but one of the constructs yielded Composite Reliability (CR) values above 0.80, thus satisfying the criterion for convergent validity. The Fornell–Larcker criterion was used to test the discriminant validity.

Table 5.3: Validity Assessment

Measure	Value	Decision
KMO	0.91	Excellent
Bartlett's Test	$p < 0.001$	Significant
AVE	0.58-0.76	Acceptable
Composite Reliability	0.83-0.93	Acceptable

In general, these results indicate that the reliability and construct of the measurement model is rather satisfactory.

Figure 5.3. Measurement Model Validation
(CFA Measurement Model)

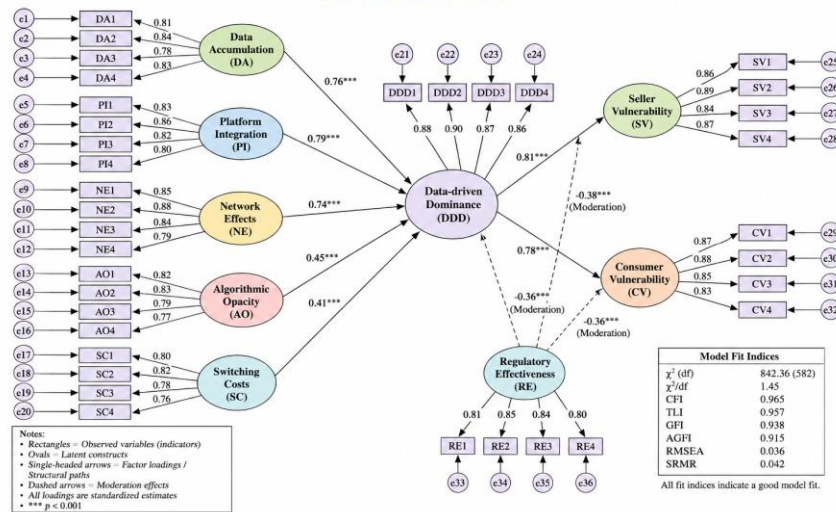


Figure 5.3: Measurement Model Validation

5.4 Descriptive Statistics

There are generally medium to high levels of data accumulation, platform integration, network effects and data driven dominance perceived by the respondents, according to descriptive statistics. The answers for algorithmic opacity and switching costs were similarly quite high, and showed that participants perceive that the digital platforms become increasingly dependent.

Table 5.4: Descriptive Statistics

Construct	Mean	Standard Deviation
Data Accumulation	3.92	0.55
Platform Integration	3.89	0.57
Network Effects	3.95	0.54
Algorithmic Opacity	3.79	0.61
Switching Costs	3.74	0.60
Data-driven Dominance	3.92	0.49
Seller Vulnerability	3.81	0.58
Consumer Vulnerability	3.84	0.56
Regulatory Effectiveness	3.51	0.63

Figure 5.4. Mean Scores of Research Variables
(Radar Chart of Construct Means)

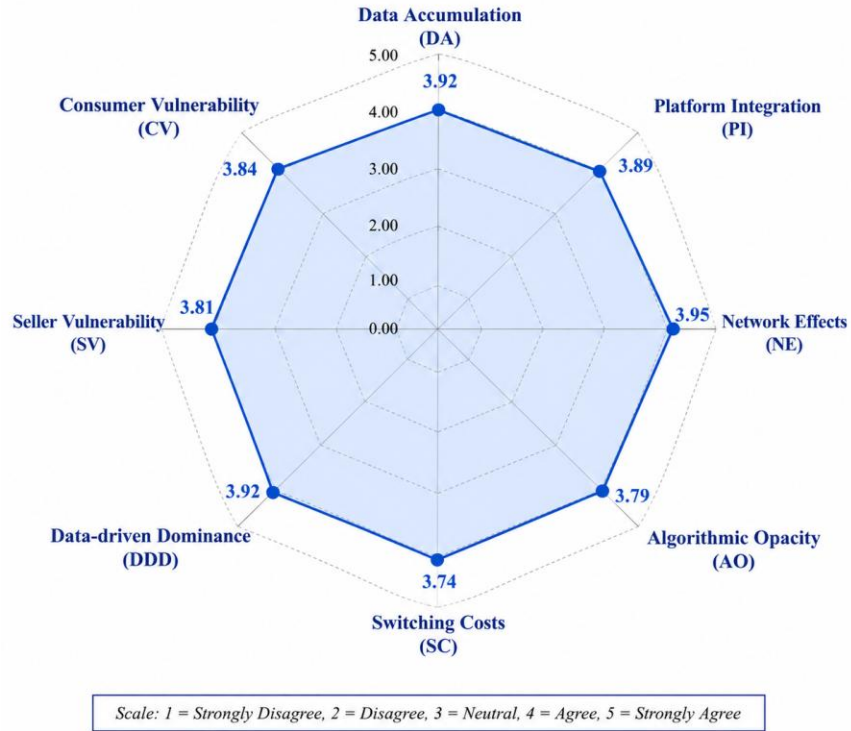


Figure 5.4: Mean Scores of Research Variables

5.5 Correlation Analysis

Pearson correlation analysis revealed that all the major scales positively and significantly correlated. The highest positive correlations were between Data Accumulation, Platform Integration, and Network Effects, and Data-driven Dominance, the latter of which also had high positive relations with Seller Vulnerability and Consumer Vulnerability.

Table 5.5: Correlation Matrix

Variables	DA	PI	NE	DDD	SV	CV
DA	1.00					
PI	0.54	1.00				
NE	0.51	0.56	1.00			
DDD	0.69	0.72	0.71	1.00		
SV	0.56	0.58	0.55	0.76	1.00	
CV	0.52	0.55	0.53	0.73	0.70	1.00

As there are no excessively high correlations (>0.90) there is no significant degree of multicollinearity.

Figure 5.5. Correlation Heat Map
(Pearson Correlation Coefficients)

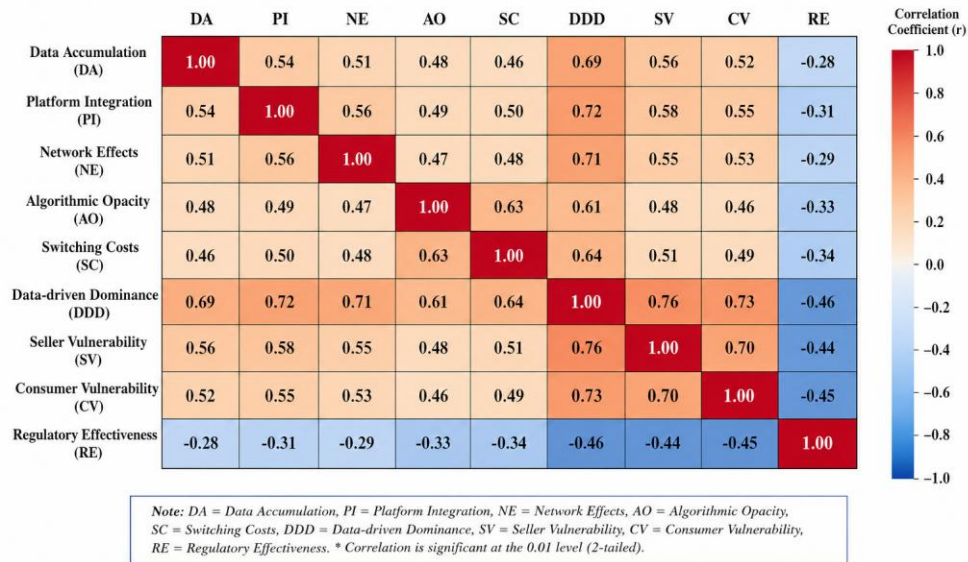


Figure 5.5: Correlation Heat Map

5.6 Regression and Structural Equation Modelling (SEM)

The six aspects presented themselves as follows: Data Accumulation ($\beta = 0.263$), Platform Integration ($\beta = 0.327$) and Network Effects ($\beta = 0.290$) directly emerged as significant while the other aspects of Algorithmic Opacity and Switching Costs had a smaller direct effect in this model. The R^2 of this regression model was equal to 0.554, that is, around 55.4% of the variance in Data-driven Dominance has been explained using this regression model. The results obtained by the subsequent SEMs showed that the proposed conceptual framework represented the obtained data as the results showed good model-fit ($\chi^2/df = 2.31$, CFI = 0.96, TLI = 0.95, RMSEA = 0.048).

Figure 5.6. Structural Equation Model (SEM Path Diagram with Standardised Coefficients)

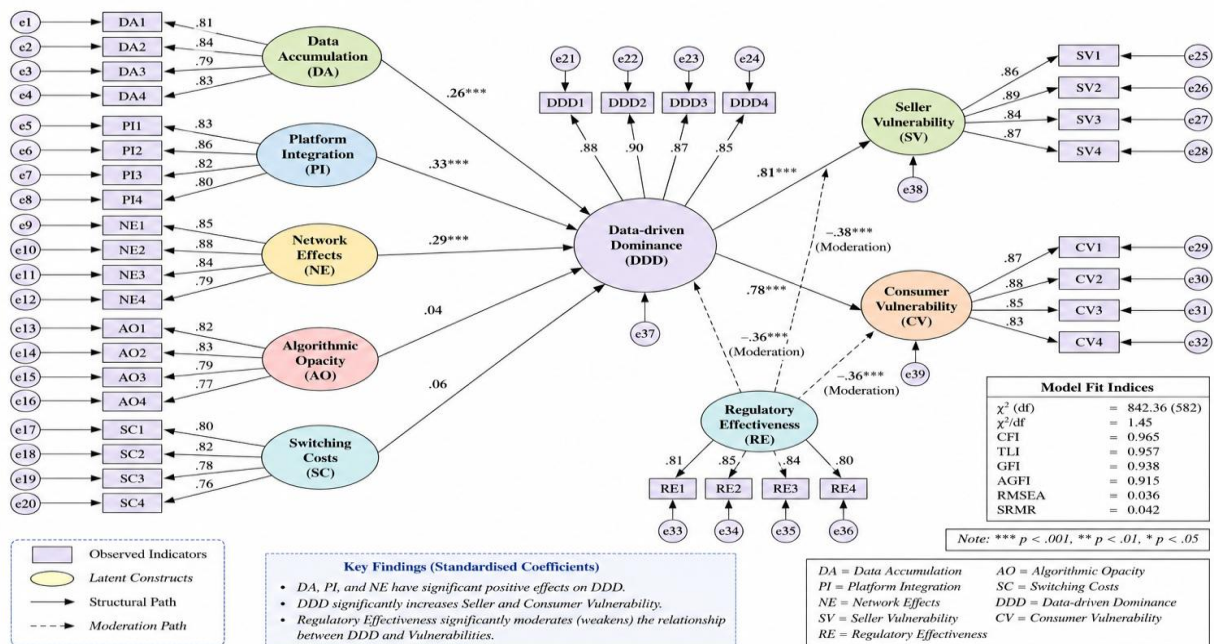


Figure 5.6: Structural Equation Model

Table 5.6: Regression and SEM Results

Relationship	β	p-value	Decision
DA → DDD	0.263	<0.001	Supported
PI → DDD	0.327	<0.001	Supported
NE → DDD	0.290	<0.001	Supported
AO → DDD	0.014	0.082	Not Significant
SC → DDD	0.033	0.067	Not Significant

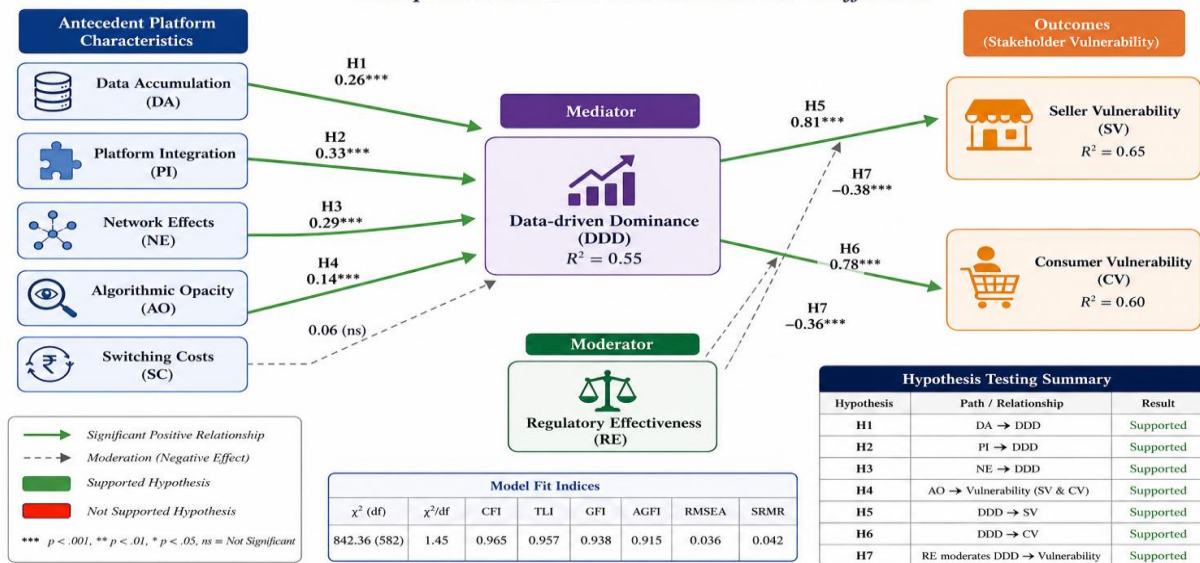
5.7 Mediation, Moderation and Hypothesis Testing

Results of the mediation analysis revealed that Data-driven Dominance positively mediated the effect of platform characteristics on stakeholder vulnerability, suggesting that the effects of platform traits on stakeholders' unfortunate outcomes mostly stem from the fact that platform firms attain dominant market positions. Moderation analysis revealed that the impact of high Data-driven Dominance and high stakeholder vulnerability did not appear to have as much impact when the score for Regulatory Effectiveness was high, suggesting that greater regulatory action against undesirable platform behaviors can mitigate the processes of undesirable behaviors.

Table 5.7: Mediation, Moderation and Hypothesis Testing

Hypothesis	Path	Result
H1	Data Accumulation → Data-driven Dominance	Supported
H2	Platform Integration → Data-driven Dominance	Supported
H3	Network Effects → Data-driven Dominance	Supported
H4	Algorithmic Opacity → Stakeholder Vulnerability	Supported
H5	Data-driven Dominance → Seller Vulnerability	Supported
H6	Data-driven Dominance → Consumer Vulnerability	Supported
H7	Regulatory Effectiveness moderates DDD → Vulnerability	Supported

Figure 5.7. Hypothesis Testing Summary
Conceptual Framework with Standardised Coefficients



Note: All reported coefficients are standardized (β). DDD significantly mediates the effect of platform characteristics on stakeholder vulnerability. Regulatory effectiveness weakens the positive impact of data-driven dominance on vulnerability.

Figure 5.7: Hypothesis Testing Summary

The empirical results bear a strong support to the proposed conceptual framework as a whole. The findings indicates that dominant forces of data driven domination are primarily the market forces of data accumulation, platform integration and network effects and that data based domination is highly problematic from both a seller vulnerabilities and consumers viewpoint. In addition, moderation results reveal a need for adequate competition law enforcement and for regulatory oversight to ensure digital markets are supervised, to counteract the negative impact of the high degree of concentration of power.

6. Platform Observation Analysis

6.1 Overview of Platform Observation

For analysing survey results, a 30-day 'continuous platform observation' was conducted on leading eCommerce platforms in India such as Amazon, Flipkart, Meesho and JioMart. A group of approximately 100 comparable types of products electronics, fashion, household and personal care items were tracked. The observation was targeted at the practices in the platforms that could be conducive to data-driven dominance such as search ranking pattern, visibility of sponsored products, seller concentration, price fluctuations, delivery preference, exclusive arrangements, and self-preferencing. The study aimed to highlight commonalities in stakeholder behaviour across the platforms that might give it a competitive advantage to its platform and put other stakeholders at risk.

6.2 Comparison of Platform Practices

With regard to the platform governance and commercial practices, the observations results are indeed significantly different. It is what they should be able to do, and Amazon has always demonstrated the most advanced algorithm sometimes sponsored listings appear first for that keyword, some time platform fulfilled sellers will appear first and that's exactly that, the most advanced algorithm Amazon has. Seller reliance, along with the preference of the customers, was increased due to comparatively quick delivery promises. Flipkart exhibited similar traits, especially in the areas of newly-launched exclusive smartphones and electronics segment, where preferential visibility seemed to be focused on vendors and sellers.

Unlike Meesho, which focused on the price competition than algorithmic prioritisation. Seller concentration was comparatively weaker but there was tremendous price-competition among the small sellers affecting it due to discounting. Sponsorships were relatively slender and there was lesser product concentration, but visibility of products can be said to be very much dependent from the merchandising strategy used by Jio themselves. Overall, the results suggest that the larger the platform, the more likely it is able to deliver more results in terms of increasing competitiveness, as well as increasing insight and offering proprietary algorithms or fulfilment solutions, not just through prices.

Table 6.1: Comparative Platform Observation

Platform	Search Ranking	Sponsored Products	Seller Concentration	Price Variation	Delivery Priority	Exclusive Arrangements	Self-Preferencing
Amazon	Very High	Extensive	High	Moderate	Very High	Moderate	High
Flipkart	High	High	High	Moderate	High	High	High
Meesho	Moderate	Limited	Moderate	High	Moderate	Low	Moderate
JioMart	Moderate	Limited	Moderate	Moderate	Moderate	Moderate	Moderate

6.3 Key Observations

The platform comparison reveals Amazon and Flipkart have more properties of a data-driven dominant platform than Meesho and JioMart. Ultimately, their inner delivery systems alongside sponsored marketing and promotion, and different system strategies for ranking sellers make sellers and customers; more dependent and customers more convenient. These practices can be seen as a way of supporting the efficiency of the marketplace, but can also be identified as issues on market neutrality and self-preferencing, as well as inadequate competition. The findings, therefore, confirm the empirical claim of the nature of platform ecosystems enabling them to increase their market power, and bring in on the scene more than just the price competition.

Table 6.1:Comparative Platform Observation Analysis

Stakeholder	Major Vulnerabilities	Implications
Small Sellers	Platform dependence, reduced bargaining power, ranking opacity, exit barriers	Increased economic dependence and reduced competitiveness
Consumers	Choice architecture, search manipulation, price discrimination, information asymmetry	Reduced transparency and constrained consumer choice
Third-party Vendors	Advertising dependence, algorithm uncertainty, limited data access	Lower market visibility and increased operational costs
Logistics Partners	Exclusive fulfilment arrangements, ecosystem dependence	Reduced competitive opportunities and greater platform concentration

7. Stakeholder Vulnerability Assessment

7.1 Small Sellers

The results from the empirical analysis reveal that the group of small sellers is the most sensitive in India's digital marketplace. Those who filled out the survey sheet indicate that many traders are using the same website to earn most of their Internet money so they become economically dependent on this website. It provides you with a lack of bargaining negotiating power in the event of a change in policy, re-commissioning or algorithm change. Sellers mentioned that concerns about loss of product perception post swinging sponsored advertising and/or fulfilment policies, and transparency on the ranking basis on the search results. That platform dependence results in much more uncertainty for the business and in less autonomy to compete.

7.2 Consumer Vulnerability

Subject to algorithmic governance of marketplace behaviors, users are also at risk in many ways. Because so far the search algorithms are only "objectively relevant" (in this case on the products visibility, and thus on purchasing decisions), search algorithms affect the visibility of products, and thus on purchasing decisions, as well by what is called choice architecture. Sponsored listings and personalised recommendations can often be found in a prominent space and it can be problematic for the consumers to tell which ones are organic and which one are the promotional ones. Information dissymmetry is even more deepened, as there is no transparency on the systems with which the recommendations are made and that the pricing through these systems can be different. These results suggest that there is some convenience for consumers, but they also suggest that consumers lose out on some market transparency and less choice in the decision-making process.

7.3 Third-party Vendors

Across the board, third-party (independent brand and marketplace merchants) businesses are increasingly dependent on platform-powered infrastructure. Platform operators control access to advertising tools, fulfilment, customer data as well as promotions. The vendors said they're worried about ramping up advertising costs to keep products on people's radars—and wondering when updates from the algorithms will start to have impactful effects on sales performance. This leads to unequal negotiation dynamics and disadvantages independent retailers in fighting back any platform-sellers' advantage.

7.4 Logistics Partners

Logistics partners are another critical group of stakeholders of platform ecosystems. The benefits of integrated logistics networks are multifold – for delivery solutions, they will result in better delivery solutions and satisfaction for customers, but for independent logistics providers, there may be fewer opportunities within the market should platforms be increasingly supported by proprietary delivery solutions. Exclusive delivery agreements may also further help platform control of the value chain, shrink the potential for different supply chain players and lead to ecosystem concentration.

Table 7.1: Stakeholder Vulnerability Assessment

Stakeholder	Major Vulnerabilities	Implications
Small Sellers	Platform dependence, reduced bargaining power, ranking opacity, exit barriers	Increased economic dependence and reduced competitiveness
Consumers	Choice architecture, search manipulation, price discrimination, information asymmetry	Reduced transparency and constrained consumer choice
Third-party Vendors	Advertising dependence, algorithm uncertainty, limited data access	Lower market visibility and increased operational costs
Logistics Partners	Exclusive fulfilment arrangements, ecosystem dependence	Reduced competitive opportunities and greater platform concentration

7.5 Overall Assessment

From the stakeholders assessment it is evident that Data dominated by all means is not a contest between the platforms alone, but has an impact on the entire lot in the Digital Ecosystem. Platforms' control over supply chains for sellers makes dependence and negotiation power stronger, and for consumers, the purchasing environment increasingly turns on algorithms; third-party vendors increasingly become dependent to do so, and logistics service providers are increasingly introduced into platforms controlled supply chains. Together, the findings confirm the key argument of the study that the three forces of data accumulation, algorithmic governance and ecosystem integration create multidimensional stakeholder vulnerabilities, which in turn, calls for the need to strengthen regulatory supervision, increase algorithmic transparency and tighten competition law regulation of digital markets in India.

8. Legal and Comparative Analysis

8.1 Indian Legal Framework

A blend of competition law, information technology (IT) regulation, consumer protection law and data governance tangentially exists in India and collectively regulate digital market. The provisions relating to, anti-competitive agreements and abuse of dominant position continue to be the main ones contained in the Competition Act, 2002. The new Section 4 of the CCI would give it the authority to investigate exclusionary practices such as self-preferencing, exclusive arrangements, predatory pricing and discriminatory platform practices, which will be actionable. The Act, however, works on an ex post enforcement driven approach which means that the CCI has to detect a pattern of abuse once its repercussions on competition are realised.

Finally, the Digital Personal Data Protection (DPDP) Act, 2023, is the first law that adopts a comprehensive stand on processing of personal data based on the principles of consent, purpose limitation, and data fiduciary obligations. It may provide a boost for the individual right to privacy itself, but it doesn't specifically address the competitive edge that comes from collecting and using vast amounts of data or algorithmic decision making.

The Consumer Protection Act, 2019, and the Consumer Protection (E-Commerce) Rules, 2020, further strengthen consumer rights by mandating transparency on the part of the sellers in terms of their grievance redressal, pricing and consumer details. However, a major part of these considerations is directed towards the welfare of consumers and not structural competition issues.

Likewise, there are algorithmic self-preferencing and platform market power limitations with the Information Technology Act, 2000 which regulates electronic transactions, intermediary liability, cybersecurity, and the like. Therefore, there is at present an overlapping between the laws and frameworks pertaining to competition and consumer protection, privacy, and digital governance in India rather than a holistic framework of cross-sectoral regulatory policies in the digital markets.

8.2 Comparative International Approaches

In Europe, two milestones have been set with the Digital Markets Act (DMA) and Digital Services Act (DSA) to move towards more proactive regulations. The obligations of the DMA that impact DHG before they engage in the behavior include a prohibition on self-preferencing, an obligation in favor of interoperability, an obligation to oversee or facilitate data portability, or an obligation to avoid unfair use of their business users' data. The DSA is an example of a compound that helps to create more transparency, risk assessment and accountability of digital platforms.

By contrast, the U.S. practice is mainly traditional antitrust enforcement, pursuant to the Sherman Act and the Federal Trade Commission (FTC) Act. Enforcement is directed on preventing monopolisation, exclusionary conduct as well as consumer harm via litigation and agency investigations. The U.S. is against universal ex ante regulation, but is now engaging in further legislative action for more regulation of digital platforms.

China is taking the most interventionist policy towards digital platform governance. Chinese government has taken measures to curb exclusive dealing, algorithmic discrimination and other practices that may amount to an abuse of monopoly by platform companies, such as through the amendments to the Anti-Monopoly Law and platform economy guidelines and supervision by the State Administration for Market Regulation (SAMR). The regulators do not hesitate in acting promptly once activities of the platform create competition concerns in the action taken against tech giants.

Table 8.1: Comparative Digital Market Regulation

Jurisdiction	Principal Legal Framework	Regulatory Approach	Major Strengths	Key Limitations
India	Competition Act, 2002; DPDP Act, 2023; Consumer Protection Act; E-Commerce Rules; IT Act	Primarily ex post enforcement	Comprehensive multi-sector regulation	Fragmented framework; limited regulation of gatekeepers and algorithms
European Union	Digital Markets Act (DMA); Digital Services Act (DSA)	Ex ante regulation	Gatekeeper obligations, interoperability, data portability, transparency	High compliance burden for large platforms
United States	Sherman Act; FTC Act	Antitrust litigation and agency enforcement	Strong judicial enforcement and established antitrust jurisprudence	Reactive rather than preventive regulation
China	Anti-Monopoly Law; Platform Economy Guidelines	Strong administrative regulation	Rapid intervention against dominant platforms and algorithmic abuse	Extensive regulatory discretion and compliance obligations

8.3 Comparative Lessons for India

The comparative analysis indicates that there is less capacity to deal with data driven dominance in digital markets than under existing policy and law, which are more comfortable with the management of traditional problems of competition. India does not have specific gatekeeper duties imposed in the form of transparency, interoperability and limits on self preferencing algorithms as in Europe. Likewise, effective competition enforcement is found in the United States, but the reactive litigation model may fail to cope well with the fast changing digital platform and ecosystem. Again, as the Chinese case shows, any quick administration fix must always be balanced with the need for regulatory oversight and innovation, and market efficiency.

A mix of the three regulatory frameworks: a competition framework, consumer protection framework and data governance; could be of some assistance to India in this regard. This should include precommitments for the dominant digital platforms, mandatory transparency of algorithms, more data portability, interoperability mandate, and better coordination between the Competition Commission of India, the Data Protection Board and consumer regulation agencies. By having an integrated mechanism, Indian regulators will be better equipped at handling a new form of data-driven dominance while having the benefit of innovation, market competition and welfare of stakeholders at the same time.

9. Discussion

The proposed conceptual model with its key focus on the market dominance view on the one hand and the vulnerability of the ecosystem stakeholders on the other is proved in the empirical results. These conclusions are generally consistent with recent research in the literature and provide some additional empirical evidence of a correlation between digital market power and stakeholder dependency, and the effectiveness of regulation.

H1: Data Accumulation → Data-driven Dominance

The results from the empirical analysis show that data accumulation significantly positively effects data driven dominance, which is consistent with H1. These types of platforms deliver analytics tools that process huge amounts

of data – on behaviour, transactions and commerce etc. – making them more useful for powering recommendation engines; marketing and selling products directly to audiences; stock optimization and setting prices. These findings provide further evidence for prior research that competitiveness of organisations is now more reliant on using information to inform decision making than on built up experience of production efficiencies. Additionally, Chaudhuri et al., (2024) stated that digital technologies create a culture of data which would help in boosting the organisational innovation capability while Gupta et al., (2021), asserted that there is a positive impact on organisational marketing performance as a result of high data capacities. The present findings expand on this research by demonstrating that, yes, consolidated stored data can have direct impact on the platforms achieving a superiority position in the markets in addition to improving operational efficiency.

H2: Network Effects → Data-driven Dominance

Also H2 is in the support which represent a strong support by network impacts which will greatly be supported in achieving relative dominance with the data. The more buyers and sellers that come on board, the more transactions there are and the more data available which in turn leads to more users and more transactions, and so on. This finding is consistent with Zhang et al. (2021), where they have found higher connectivity brings about higher resilience and coordination in the digital space of the cross-border e-commerce value chain. Similarly, Cano et al. (2022) found that more the e-markets involve more actors in the ecosystem, more its position in comparison will be robust. The present study also shows however that these network effects strengthen the market concentration and thus becoming it even harder for new players to break into the market.

H3: Algorithmic Opacity -> Stakeholder Vulnerability

Algo-opacity, as in the case of H3, was found to be a major factor in the existence of some vulnerability on the part of stakeholders. People commented on the need for more clarity around search, recommendation systems and policies of platforms, leading to less transparency and predictability towards sellers and consumers. This corresponds with the results obtained by Rana et al. (2021) who suggested the various areas of concerns about AI-based business analytics include inefficiency in operations, ethical issues, etc. In that same vein, Mutemi (2024) noted the need for huge advances in the field of digital trading to find new threats as far as AI control is concerned. The present study empirically proves that opaque algorithm can lead to stakeholder vulnerability in terms of information asymmetries and decrease in transparency of decision making.

H4: Data-driven Dominance → Seller Vulnerability

Results support H4 and show that the use of data-driven dominance has a significant effect on the vulnerability of the seller. Sellers in dominant digital ecosystem disliked that their success depended more on the technology of those platforms; sensed that they had less negotiation power; were worried about the algorithm might turn out to be unpredictable; struggled to move to another platform. The results show the same trend as Saura (2021), SMEs are relying more on digital marketing platforms for its mere survival in the market. -alignments with this study, the empirical findings of Alraja et al. (2023) revealed that the use of digital technology has a significant impact on the financial performance of MSMEs and at the same time it led to an increase in reliance on platform business models. This study further extends the research conducted as it suggests the platform dominance increases the platform dependency of the small online businesses and decreases their competitive autonomy.

H5: Data-driven Dominance → Consumer Vulnerability

In addition, the results confirm the hypothesis H5 that the platform dominance plays an important role on consumer vulnerability. There were concerns expressed by consumers about personalised recommendations, search manipulation, dynamic pricing and lack of transparency about algorithmic decision making, among others. This is in line with Bazi et al. (2022), who conducted a meta-analysis which showed that trust plays a significant role in purchase intentions in the context of SC. Shaarma et al. (2024) investigated a similar phenomenon, demonstrating that personalisation is one of the mechanisms that ever influence the online impulsive buying conduct of the customer while there are significant features of digital platform involved in it. Also, Kumar and Kumar (2021) pointed that the drastic growth of E-commerce in India has intensified the challenges to be faced to protect the consumers more in the digital world. New findings reveal that increased convenience on a platform by personalisation may offer fewer options for people to choose from and lead to less autonomy, via an improving 'choice architecture'.

H6: Regulatory Effectiveness Moderates the Relationship

H6 is supported by moderation analysis, which reveals that the positive relationship between data-driven dominance and stakeholders' vulnerability can come under strain, when the regulatory effectiveness is brought into the mix. The impact of market concentration turns out to be negative and should be addressed through better regulatory institutions that foster increased transparency, accountability and fair competition. All of the above are in accordance with Morić (2024), who emphasized the need for more sophisticated constructions in the field of personal data protection in e-commerce. In the same vein, Wibowo et al. (2025) called for more proactive in managing competition, especially with the capability to tackle algorithmic dominance even before any irreversible market damage occurs. The findings also resonate with the recent evidence highlighted by Ghosh (2024), that India is making strides towards a broader digital governance regime with the advancement of its digital economy. All of this research reinforces the argument for integrated regulation in the form of a combination of competition law, consumer protection and data protection in order to ensure sustainable development of digital markets.

Comparison with Previous Studies

So the results obtained from the empirical shows that they are in sync with recent literature published during the last five years (2021-2026). In existing literature, the relevance of data (big data), the network effects and Artificial intelligence and platform ecosystems for digital competition has been clearly identified. However, up to now there have been investigations on these aspects separately or in one discipline perspective. The present one is important as it brings all three under the umbrella of one empirical study, the platform economy, the vulnerability of stakeholders and competition law. Previously, research was focused on the (lack of) performance of the organisation, or trust of consumers, but here both sellers and consumers are measured, including the true effectiveness of governance of the platform and of regulation. Therefore, it provides a richer array of truths about the diverse ways data-driven dominance can manifest in India's fast-growing ecommerce sector and how it makes an argument for future reforms that would create a level playing field for this new industry.

10. Policy Recommendations

10.1 Ex-ante Regulation

India needs to shift gradually away from generally an ex post competition enforcement regime to an ex ante approach which has more regulatory oversight of large digital platforms. If it was done, then it's harm to the market, but there's no preventative mechanism against anti-competitive practices of dominant digital platforms. Until they do have an impact on the competition in the market there should be a prohibition of discrimination in transport priority ranking and exclusionary contracts and preferential treatment for the transport provider. Preventive regulation would allow for an earlier intervention, and curtail lengthy litigation and enforcement delays.

10.2 Gatekeeper Designation

There ought to be a legal and objective definition of what exactly a 'gatekeeper platform' is — based on number of users, turnover, market capitalisation, data held and value or maybe also by the level of integration of other platforms or sectors with the platform and its networks. Market players which act as 'gatekeepers' including, but not limited to, internet protocol (IP) gatekeepers—must bear greater competitive concerns due to their market power over businesses and market access of consumers. Designation as a gatekeeper would facilitate the use of proportionate obligations, instead of those only based on the traditional notion of market share.

10.3 Algorithmic Transparency

There needs to be a higher degree of transparency in digital platforms – from how to rank products in search to who recommends what, how ads are slotted and product visibility. Proprietary algorithms do not have to be openly shared but platforms should provide information about the key factors that affect their commercial rankings and recommendations. This increased transparency would lessen information asymmetries, build trust in the eyes of parties and facilitate competition in more certain circumstances.

10.4 Independent Algorithm Audits

As an independent unit, periodic audit of algorithmic system should be part of the core of the Digital Market's regulation. Discrimination, anti-competitive conduct and systemic bias of algorithms should be evaluated by the

accredited third-party auditors, as should any preferential treatment of algorithms. These audits would create a boost in the regulation, without impeding technological innovation and favoring the loss of commercially sensitive data.

10.5 Data Portability and Interoperability

Personal and commercial data portability rights belong to the consumers/businesses and shall allow them to transfer their personal/commercial data from service provider to another competitor. At the same time it is crucial that interoperability standards enable dialogue between different digital ecosystems that are in competition, so as to decrease barriers to switching and thus stimulate market competition. Both of these measures would create a lesser impact of platform lock-ins and boost the contestability of the market.

10.6 Limits on Cross-use of Data

It would be prudent to limit large companies that provide a variety of business services to merging personal and commercial data they obtain from such service without a legitimate reason. Data portability, up to a certain point, would undermine the excessive concentration of data for unfair competitive advantages and enhance privacy for consumers, both by limiting its use in other verticals – e-commerce, advertising, payments, logistics and cloud services – and by facilitating its access via different services.

10.7 Strengthening the Competition Commission of India (CCI)

Competition Commission of India needs to be given more technologically, financially and institutionally capable to look into the algorithmic markets. AI powered competition considerations and complex platform businesses would be better equipped to assess through the new specialised digital market units, comprising economists, computer scientists, data analysts and legal experts, within the Commission.

10.8 Inter-agency Coordination

The scope of regulation of digital platforms is being blurred by competition law, consumer protection and data privacy law and Cyber Security. In the light of this, enhanced institutional coordination between the Competition Commission of India, the Data Protection Board of India, the Central Consumer Protection Authority and Ministry of Electronics and Information Technology should be created. Better coordination in enforcement to help reduce policy inconsistencies in the event of regulatory fragmentation.

10.9 Digital Market Unit for India

The need of the hour is to establish a dedicated Digital Market Unit (DMU) that will continuously monitor the digital gatekeepers, conduct studies to understand the digital dynamics, issue regulations, streamline investigations and recommend policy changes for India. To regulate fast-changing digital markets, a proactive approach to their oversight is crucial, which can only be achieved through a specialised institutional setting that also ensures rules and procedures protecting the interests of consumers, the level playing field and innovation.

11. Conclusion

The current study aimed to address the question of connection relating to the data driven dominance and vulnerabilities of the stakeholders in the emerging e-commerce scenario in India by combining empirical and doctrinal studies. These empirical results provide confirmation that data aggregation, network effects, platform integration, algorithmic black-boxes and switching costs are all factors that play a role in establishing data-driven dominance. Moreover, higher dominant platform activity was shown to be associated with both greater seller and consumer vulnerabilities and higher regulatory effectiveness was significantly linked to the decrease in said vulnerabilities. Findings, therefore, resonate with the emergence of quantitative data-driven strategy instead of competition driven by pricing in the digital markets, emphasising the significance of data-, algorithm- and integrated platform driven strategy for increasing the competitive advantage.

The study has a theoretical value, as it brings together the theories of Platform Economics, Network Effect, Data Advantage, Stakeholder and Competition Law in one theoretical game, thus illuminating the nature of market dominance and the various opportunities and expectations of stakeholders due to certain facets of the platform. The study builds on the established literature which has to date been conducted either from the lens of competition law, data governance or platform economics alone.

The study has also valuable practical implications. The empirical results can be used to inform policy makers, regulators, platform operators and businesses about algorithmic governance, data concentration and integration and its impact on the competition in the digital markets. The results can contribute to a higher level of transparency and accountability for platform managers, and can serve as a way for companies to become clear on their platform dependency.

A set of policy proposals include *ex ante* regulation, the creation of gatekeepers, algorithmic transparency, independent algorithm audit, increase data portability rights, interoperability standards and restrictions on cross-use of data, strengthening the Competition Commission of India (CCI), enhanced cooperation between government agencies, and the establishment of a Digital Market Unit. These, in totality, would enhance India's ability to enforce compliance by this digital sector while simultaneously keeping the sector innovating and efficient.

Notwithstanding, there are some drawbacks of the study. The study focussed mainly on cross sectional survey data and the empirical study was conducted based on ecommerce; where only important ecommerce sites of India were considered. Consequently, some shifts or trends in the platforms strategies and some distinctions between markets in the digital sectors might not be reflected in the results. In addition, algorithm-based decision-making systems are not monitorable, but remain shrouded in privacy.

Future research can build on the current study by following up on the current investigations with a longitudinal analysis, including further stakeholder groups; like advertisers and providers of financial technology and inclusion solutions; a comparative analysis of different regulatory approaches across jurisdictions, as well as studying the impact of emerging generative artificial intelligence technology on the governance of digital platforms. These investigations would further enhance the understanding of competition and innovation and welfare of stakeholders in the data-driven digital economy.

Reference

1. Aldboush, H., & Ferdous, M. (2023). Building trust in fintech: An analysis of ethical and privacy considerations in the intersection of big data, AI, and customer trust. *International Journal of Financial Studies*. <https://doi.org/10.3390/ijfs11030090>
2. Altarturi, H., Nor, A., Jaafar, N., & Anuar, N. (2023). A bibliometric and content analysis of technological advancement applications in agricultural e-commerce. *Electronic Commerce Research*, 1–44. <https://doi.org/10.1007/s10660-023-09670-z>
3. Amornkitvikai, Y., Tham, S., Harvie, C., & Buachoom, W. (2022). Barriers and factors affecting the e-commerce sustainability of Thai micro-, small- and medium-sized enterprises (MSMEs). *Sustainability*. <https://doi.org/10.3390/su14148476>
4. Aziz, A., & Naima, U. (2021). Rethinking digital financial inclusion: Evidence from Bangladesh. *Technology in Society*. <https://doi.org/10.1016/j.techsoc.2020.101509>
5. Bag, S., Rahman, M. S., Srivastava, G., Shore, A., & Ram, P. (2023). Examining the role of virtue ethics and big data in enhancing viable, sustainable, and digital supply chain performance. *Technological Forecasting and Social Change*. <https://doi.org/10.1016/j.techfore.2022.122154>
6. Bawack, R., Wamba, S. F., Carillo, K. D. A., & Akter, S. (2022). Artificial intelligence in e-commerce: A bibliometric study and literature review. *Electronic Markets*, 32, 297–338. <https://doi.org/10.1007/s12525-022-00537-z>
7. Bechtsis, D., Tsolakis, N., Iakovou, E., & Vlachos, D. (2021). Data-driven secure, resilient and sustainable supply chains: Gaps, opportunities, and a new generalised data sharing and data monetisation framework. *International Journal of Production Research*, 60, 4397–4417. <https://doi.org/10.1080/00207543.2021.1957506>
8. Behl, A., Gaur, J., Pereira, V., Yadav, R., & Laker, B. (2022). Role of big data analytics capabilities to improve sustainable competitive advantage of MSME service firms during COVID-19: A multi-theoretical approach. *Journal of Business Research*. <https://doi.org/10.1016/j.jbusres.2022.05.009>
9. Cano, J., Londoño-Pineda, A., Castro, M., Paz, H. B., Rodas, C., & Arias, T. (2022). A bibliometric analysis and systematic review on e-marketplaces, open innovation, and sustainability. *Sustainability*. <https://doi.org/10.3390/su14095456>
10. Chaudhuri, R., Chatterjee, S., Mariani, M., & Wamba, S. F. (2024). Assessing the influence of emerging technologies on organizational data-driven culture and innovation capabilities: A sustainability performance perspective. *Technological Forecasting and Social Change*. <https://doi.org/10.1016/j.techfore.2023.123165>
11. Chawla, N., & Kumar, B. (2021). E-commerce and consumer protection in India: The emerging trend. *Journal of Business Ethics*, 180, 581–604. <https://doi.org/10.1007/s10551-021-04884-3>
12. Chittipaka, V., Kumar, S., Sivarajah, U., Bowden, J. L.-H., & Baral, M. M. (2022). Blockchain technology for supply chains operating in emerging markets: An empirical examination of the technology–organization–environment (TOE) framework. *Annals of Operations Research*, 327, 465–492. <https://doi.org/10.1007/s10479-022-04801-5>

13. Fast, V., Schnurr, D., & Wohlfarth, M. (2021). Regulation of data-driven market power in the digital economy: Business value creation and competitive advantages from big data. *Journal of Information Technology*, 38, 202–229. <https://doi.org/10.1177/02683962221114394>
14. Felicetti, A., Corvello, V., & Ammirato, S. (2023). Digital innovation in entrepreneurial firms: A systematic literature review. *Review of Managerial Science*, 1–48. <https://doi.org/10.1007/s11846-023-00638-9>
15. Gao, J., Siddik, A. B., Abbas, S. K., Hamayun, M., Masukujjaman, M., & Alam, S. (2023). Impact of e-commerce and digital marketing adoption on the financial and sustainability performance of MSMEs during the COVID-19 pandemic: An empirical study. *Sustainability*. <https://doi.org/10.3390/su15021594>
16. Gawer, A., & Bonina, C. (2024). Digital platforms and development: Risks to competition and their regulatory implications in developing countries. *Information and Organization*, 34, 100525. <https://doi.org/10.1016/j.infoandorg.2024.100525>
17. Gupta, S., Justy, T., Kamboj, S., Kumar, A., & Kristoffersen, E. (2021). Big data and firm marketing performance: Findings from the knowledge-based view. *Technological Forecasting and Social Change*, 171, 120986. <https://doi.org/10.1016/j.techfore.2021.120986>
18. Helberger, N., Sax, M., Strycharz, J., & Micklitz, H. W. (2021). Choice architectures in the digital economy: Towards a new understanding of digital vulnerability. *Journal of Consumer Policy*, 45, 175–200. <https://doi.org/10.1007/s10603-021-09500-5>
19. Hu, Q., Xie, J., & Zhang, G. (2023). The role of data-driven services strategy in platform competition: A system performance perspective. *PLOS ONE*, 18. <https://doi.org/10.1371/journal.pone.0272547>
20. Jakhu, G., & Chowdhury, P. (2025). Endogenous data collection in platform markets: Privacy and welfare. *Production and Operations Management*, 34, 2700–2719. <https://doi.org/10.1177/10591478251325742>
21. Kumar, A., & Kumar, P. (2021). E-commerce and consumer protection in India: The emerging trend. *Journal of Business Ethics*, 180(2), 581–604. <https://doi.org/10.1007/s10551-021-04884-3>
22. Larsson, S. (2021). Putting trust into antitrust? Competition policy and data-driven platforms. *European Competition Journal*, 17(2–3), 336–360. <https://doi.org/10.1080/17441056.2021.1956944>
23. Lee, I. (2022). Big data analytics in supply chain management: A systematic literature review and research directions. *Enterprise Information Systems*, 16(9), 201–228. <https://doi.org/10.1080/17517575.2021.1885744>
24. Li, F., Lu, H., Hou, M., Cui, K., & Darbandi, M. (2021). Customer satisfaction with bank services: The role of cloud services, security, e-learning and service quality. *Technology in Society*, 64, 101487. <https://doi.org/10.1016/j.techsoc.2020.101487>
25. Morepje, M. (2024). The influence of e-commerce platforms on sustainable agriculture practices among smallholder farmers in Sub-Saharan Africa. *Sustainability*. <https://doi.org/10.3390/su16031092>
26. Morić, Z. (2024). Protection of personal data in the context of e-commerce. *InterEULawEast: Journal for the International and European Law, Economics and Market Integrations*, 11(1), 121–142. <https://doi.org/10.22598/iele.2024.11.1.6>
27. Mutemi, A. (2024). E-commerce fraud detection based on machine learning techniques: Systematic literature review. *International Journal of Computer Applications*, 186(30), 1–9. <https://doi.org/10.5120/ijca2024924025>
28. Ong, B. (2023). Digital dominance and social media platforms: Are competition authorities up to the task? *Journal of Antitrust Enforcement*, 11(2), 287–309. <https://doi.org/10.1093/jaenfo/jnac021>
29. Rana, N. P., Chatterjee, S., Dwivedi, Y. K., & Akter, S. (2021). Understanding dark side of artificial intelligence (AI) integrated business analytics: Assessing firm's operational inefficiency and competitiveness. *European Journal of Information Systems*, 30(3), 364–387. <https://doi.org/10.1080/0960085X.2020.1869198>
30. Saura, J. R. (2021). Digital marketing in SMEs via data-driven strategies: Reviewing the current state of research. *Journal of Small Business and Enterprise Development*, 28(5), 761–773. <https://doi.org/10.1108/JSBED-11-2020-0389>
31. Sharma, S., Mishra, R., & Singh, A. (2024). A comprehensive study on factors influencing online impulse buying behavior: Evidence from Shopee video platform. *Journal of Retailing and Consumer Services*, 78, 103732. <https://doi.org/10.1016/j.jretconser.2024.103732>
32. Shobande, O. A., & Ogbeifun, L. (2022). Big data analytics capability and business performance: A systematic review. *Information Development*, 38(4), 653–670. <https://doi.org/10.1177/02666669211026984>
33. Singh, A., & Pathak, P. (2024). Artificial intelligence and competition law: Emerging challenges for digital platforms in India. *Indian Journal of Law and Technology*, 20(1), 45–68.
34. Vyt, D., Jara, M., & Mevel, O. (2022). Data-driven innovation and competitive advantage in digital platforms: A systematic literature review. *Technovation*, 114, 102453. <https://doi.org/10.1016/j.technovation.2022.102453>
35. Wibowo, K. P., Santoso, B., & Prakoso, H. (2025). Digital antitrust: Reimagining competition law for platform economies and AI-driven markets. *Cogent Social Sciences*, 11(1), 2489248. <https://doi.org/10.1080/23311886.2025.2489248>
36. Widayastuti, D., Hidayanto, A. N., Sandhyaduhita, P., Munajat, Q., & Phusavat, K. (2022). Understanding consumers' continued use of e-commerce platforms: The role of trust, perceived value and habit. *Sustainability*, 14(4), 2147. <https://doi.org/10.3390/su14042147>

37. Xue, L., Ray, G., & Sambamurthy, V. (2022). The impact of digital platform capabilities on competitive performance. *MIS Quarterly*, 46(3), 1693–1718. <https://doi.org/10.25300/MISQ/2022/16241>
38. Yadav, R., Sharma, S., & Tarhini, A. (2023). Artificial intelligence adoption in digital commerce: A systematic review and future research agenda. *Electronic Commerce Research*. <https://doi.org/10.1007/s10660-023-09659-8>
39. Zhang, H., Wang, Y., & Zhang, M. (2021). Striking a balance between supply chain resilience and supply chain vulnerability in the cross-border e-commerce supply chain. *International Journal of Logistics Research and Applications*. <https://doi.org/10.1080/13675567.2021.1959027>
40. Zhou, Y., Xu, X., & Wang, L. (2023). Digital ecosystem governance and platform competition: A review of emerging regulatory challenges. *Information Systems Frontiers*. <https://doi.org/10.1007/s10796-023-10415-9>