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Non-discriminatory storefront of digital platforms and ecosystems: Consumer experience and regulatory frameworks

Yaroslav I. Kuzminov, Alexey S. Koshel, Ekaterina V. Kruchinskaia*

HSE University, Moscow, Russia

Abstract

The expansion of digital platforms and ecosystems is reshaping consumption and the structure of modern markets. In the Russian context, a representative survey conducted by the authors indicates frequent online purchasing driven primarily by time savings, broader assortment and price accessibility. Platforms thus generate consumer benefits, including non-monetary gains that are not fully captured by conventional macroeconomic indicators. Addressing this measurement and regulatory problem, the paper integrates transaction cost economics with the concepts of the non-discriminatory storefront and digital consumer surplus. Empirically, we use a three-stage sequential econometric strategy. Model 1 examines access to paid ecosystem subscriptions; Models 2–8 examine heterogeneity in subscription motives among paid-subscription users; Model 9 examines diversification beyond the primary ecosystem through third-party subscriptions. The results indicate that settlement type is not associated with paid-subscription use once age, education, income and other covariates are controlled for, while income and education remain significant correlates. Among subscribers, cost savings are the dominant motive; higher income is associated with bonuses/cashback and convenience, whereas trust is not significantly associated with income. In Model 9, trust is negatively associated with frequent third-party subscriptions, a pattern consistent with trust-based ecosystem loyalty, while bonuses/cashback are positively associated with subscription diversification. On this basis, the paper derives four legal dimensions of non-discrimination concerning information disclosure, ranking and pricing, manipulative interface design, and self-preferencing. The policy implication is not that ecosystem scale is benign per se, but that antitrust assessment should evaluate market power together with consumer access, transaction-cost reductions, and discriminatory platform practices.

Keywords: digital platform, digital ecosystem, marketplace, bundled subscription, online purchases, price discrimination, self-preferencing, online storefront, platform interface, digital consumer surplus.
JEL classification: D12, L40, L86, O33.

* Corresponding author, E-mail address: ekruchinskaya@hse.ru

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1. Introduction

In the context of a global technological transformation, digital platforms and the multilateral ecosystems that are formed around them have become fundamental drivers of economic development at both the global and the national levels.

At the global level, this landscape is shaped by the activities of the technological giants grouped as GAMAM (Google, Amazon, Meta,[1] Apple, Microsoft). With combined revenues exceeding $1.5 trillion in 2024, these companies have diversified their influence from e-commerce to cloud computing. A similar trend is observable in Russia: according to the Bank of Russia (2024, p. 71), the assets and annual revenues of major Russian big tech companies exceeded RUB 2 trillion.

Such a high concentration of resources and influence has provoked intense debate within academic circles. By the early 2010s, Google (now Alphabet), Amazon, Apple, and Meta (Facebook[2]) had already come to be labeled the "Big Four" or the "four horsemen," underscoring their extraordinary capacity to shape social change, to influence the behavior of billions of users, and to accumulate vast datasets. Within Shoshana Zuboff's framework (Zuboff, 2019), this phenomenon is described as the emergence of "surveillance capitalism," predicated on extracting profit from predictive analytics of human behavior. Sabine Pfeiffer (2022), introducing the notion of "distributive power" by analogy with Marxist productive forces, argues that platform-based digital capitalism is oriented less toward creating new value than toward the guaranteed, low-risk realization of existing value.

At the same time, as Ulrich Dolata's analysis shows (Dolata, 2024), the question of the nature of platforms remains contested. His theory, which may be seen as a sociological extension of new institutional economics, offers a critical view of platforms as "privatized institutions of coordination." Dolata characterizes platforms as hybrid regulators where transaction costs are reduced through the algorithmization of the market environment rather than through internal vertical integration, while warning that the substitution of algorithmic governance for public regulation leads to the alienation of autonomy and the concentration of monopoly rents. He also concludes that platform activity can result in the disappearance of entire economic sectors (for example, independent logistics firms outside the ecosystem).

However, within Dolata's thesis of an "asymmetric structural compromise," where operational efficiency and cost reduction serve as instruments for establishing private control, insufficient attention is paid to the fundamental benefits accruing to end consumers and small producers. It is precisely the lowering of entry barriers and the drastic reduction in the cost of access to goods and services offered by platforms that become a powerful source of their legitimation.

An important point that does not constitute the main subject of this paper but shares similar foundations is that the 2025 Nobel Memorial Prize in Economic Sciences was awarded to three scholars (P. Aghion, P. Howitt, and J. Mokyr) for their theoretical and practical contributions to the theory of new economic growth based on technology and innovation (Veselov, 2026). In subsequent work, rather

[1] The organization is recognized as extremist and is prohibited in the Russian Federation.
[2] Owned by that organization that is prohibited in the Russian Federation.

than here, we will examine how these theories can be applied to the analysis of the development of digital platforms and ecosystems, since the latter are evident sources of innovations, both technological and institutional, in the economy.

Indeed, the economic impact of digital platforms from the 2010s onward has been enabled by the maturity of digital infrastructure, globally and all the more so nationally — the global Internet and its wide accessibility to anyone, vast data storage and processing capacity, and widely available personal devices that combine the useful functions of more than twenty previously separate types of electronic equipment, from a telephone to a game console, from a heart-rate monitor to a video player, from a diary to a movie camera (Morgan-Thomas et al., 2020). Just as the personal computer enabled the information revolution, the revolution of digital ecosystems was enabled by easy and rapid personal access to an extremely wide set of potential goods and services (Parker et al., 2016).

From the standpoint of new institutional economics, this transformation may rest on a revision of classical views about the boundaries of the firm and the market. According to Ronald Coase's seminal work (Coase, 1937), the existence of the firm is justified by the need to reduce the transaction costs of the market mechanism. However, contemporary digital platforms are institutions that radically redistribute and minimize transaction costs related to information and property rights (Kuzminov et al., 2026). Whereas in the pre-digital era the costs of searching for information, measuring quality, and enforcing rules were often prohibitive, blocking transactions altogether, algorithmic mechanisms of filtering and trust now make such transactions economically feasible, thereby expanding the boundaries of market exchange.

These theses have been corroborated by recent publications that further explore the implications of transaction cost economics (TCE) for the digital economy. Golovanova et al. (2024) demonstrate how the rise of digital technologies and multi-sided platform business models profoundly alter transaction costs in contracting, as well as the costs of control within firms, making previously unobservable characteristics and actions visible to various parties. While these changes are transformative, Nagle et al. (2025) argue that TCE continues to provide a crucial lens for understanding the organization of economic activity in the digital sphere. Their research agenda highlights how digital transactions allow scholars to probe the boundary conditions of TCE, acknowledging the ongoing debate about how digital technologies precisely affect the boundaries between firms and markets. In this context, Avdasheva and Geliskhanov (2025) expand the application of TCE to the digital sphere, emphasizing that digitalization not only alters transaction costs but also gives rise to sophisticated hybrid governance structures.

Moreover, there are several indicators suggesting that the digital economy displays signs of dynamic competition rather than indications of straightforward monopolistic power. The digital era demonstrates productivity growth, rapid innovation and a high frequency of entry by new firms. In the segments of digital consumer goods, telecommunications, and broadcasting, increases in output, quality improvements, and price declines have been observed (Byrne and Corrado, 2020). Such a trend would be difficult to explain if the technology giants were suppressing competition by exercising the advantage of their large-scale production as the large trusts of the industrial era did (for example, in extraction industries). Today, we seem to be observing a group of diversified technology

giants that compete with one another under oligopolistic conditions and are occasionally joined by new adjacent entrants. This scenario of broad competition has been termed "moligopoly" (Petit, 2020).

Finally, this paper refers to the GDP-B framework developed by Brynjolfsson et al. (2018). The authors show how welfare gains from new and "free" digital goods can be incorporated into an extended measure of economic growth. Using Facebook as an empirical example, they estimate that including the welfare gains generated since its launch in 2004 could have added nearly 0.5 percentage points (p.p.) to GDP growth per year in the United States. This estimate refers to the adjustment to measured growth that would arise from incorporating consumer-welfare gains within the GDP-B framework, rather than to additional market output recorded in conventional GDP. At the scale of comprehensive ecosystems that integrate search, choice and transaction services with financial services, retail, logistics and entertainment, such otherwise unmeasured consumer benefits may accumulate through savings of money, time and other resources. This motivates our use of the term digital consumer surplus. The macroeconomic mechanism behind this transformation is confirmed by Schwark and Tryphonides (2025), who study the impact of digitalization on the production function (see below).

Thus, the key question framing the relevance of this study arises: are the observed digital markets, formed by ecosystems, discriminatory against consumers, or do their scale and efficiency generate positive externalities and a consumer surplus that could be destroyed if the classical antitrust norms are applied in the "old-fashioned" way? The application of outdated regulatory approaches may suppress innovation and reduce aggregate welfare. The research question this article seeks to answer is as follows: given the specific features of digital ecosystems, how can we determine their empirical impact on consumer welfare and propose preliminary regulatory concepts that minimize the risk of losing the digital consumer surplus while fostering technological efficiency?

The scientific novelty of this study lies in its distinct interdisciplinary approach, which fundamentally reconfigures the analysis of digital ecosystems. We bridge economic theory — specifically TCE, in both its seminal and modern versions — with an original methodological framework for understanding platform intermediation. This framework synthesizes and empirically operationalizes the concepts of the non-discriminatory storefront and digital consumer surplus. These constructs, previously fragmented across economic, legal, and innovation scholarship, are here integrated into a unified analytical framework, offering a robust and coherent foundation for a new paradigm of legal and antitrust regulation.

The paper critically re-evaluates traditional antitrust approaches. Rather than focusing on industrial concepts of monopoly power and market share — metrics often inadequate for capturing the dynamic, multi-sided nature of the digital economy — we introduce the Non-Discriminatory Storefront concept. This framework, rooted in the cost-reducing and efficiency-enhancing potential of digital platforms, allows for the rigorous evaluation of the digital consumer surplus, representing the non-monetary economic benefit to households that conventional macroeconomic indicators fail to capture. This approach implies a crucial shift in regulatory emphasis: from protecting abstract competitors to assessing consumption efficiency and the genuine welfare generated by contemporary digital ecosystems, thereby aligning policy with the actual value creation in the digital age.

Moreover, the methodological novelty of the research is supported by its empirical application to Russian survey data. The dataset used in this article contains 3,026 respondents from a 2025 data collection within the HSE Household Economic Behavior project. We examine the theoretical constructs through a three-stage sequential econometric strategy rather than a hierarchical or multilevel model. The empirical results document perceived savings of money and time, broader choice, and systematic differences in access, motives, and subscription behavior; these findings provide evidence consistent with specific dimensions of the proposed framework rather than a causal test of the framework as a whole.

Taken together, the empirical results show that platform-enabled reductions in search, coordination, and switching-related frictions are associated with observable consumer benefits and with distinct patterns of ecosystem use. The analysis is interpreted as associational evidence from survey data, not as causal identification of ecosystem effects.

This study has several limitations. The empirical analysis relies on primary cross-sectional survey data that are predominantly categorical and therefore provide less granularity than continuous behavioral or transaction-level data. The binary logit specifications require the usual assumptions concerning model specification and independent observations. The multinomial logit additionally relies on the Independence of Irrelevant Alternatives (IIA) assumption; as in many applications to social survey data, IIA should be treated as a modeling assumption rather than as an exact description of individual behavior. These features limit causal interpretation: the estimated coefficients and marginal effects are interpreted as conditional associations. The results are also specific to the Russian institutional and consumer context and should be generalized to other platform markets with caution.

2. Literature review

The debate on the nature of digital platforms and digital ecosystems begins with a fundamental measurement problem. The contemporary economic paradigm is undergoing an interpretive crisis caused by a gap between traditional national accounting methods (e.g., the System of National Accounts) and the real effects of digitalization. The core problem is that these methods do not fully capture the contribution of digital ecosystems to improvements in consumer welfare and therefore prevent an adequate assessment of that contribution to the economy and impede the formation of effective regulatory policy.

This is an obvious methodological lacuna, which can be called the "deflationary effect of digital optimization." It manifests itself in the fact that an ecosystem's efficiency, expressed in substantial price reductions and the minimization of consumers' physical movements, can paradoxically lead to a statistical decline in nominal GDP. For example, when a consumer shifts from purchasing costly physical media to subscription streaming media services or replaces many shopping trips with a single optimized delivery, the overall volume of monetary transactions (for fuel, vehicle depreciation, retail markups) falls. From the standpoint of classical national accounts, this is a decline in economic activity. However, from the perspective of welfare economics, it is a pure gain reflected in the release of consumers' time and resources. This paradox requires lawyers and economists

to abandon using "market turnover" as the sole measure of success, since in the digital environment a fall in sectoral revenues may accompany a substantial increase in consumer utility.

It is important to mention that for further analysis a distinction must be drawn between the concepts of a digital platform and a digital ecosystem[3] (Kuzminov et al., 2026), considering that an ecosystem represents a more complex phenomenon, as outlined by Jacobides et al. (2024). Digital platforms fundamentally change the ways other organizations create value, form value propositions, and interact with customers (Pousttchi and Gleiss, 2019; Pousttchi et al., 2019). Thus, while differentiating digital platforms from ecosystems, we will assess the externalities derived from both.

What is the fundamental problem in the perception of digital platforms and digital ecosystems? It is the fact that, due to their non-monetary benefits not yet being measurable macroeconomically, the crisis of macroeconomic interpretation is reflected in the microeconomic theory of the firm, specifically in the discussion surrounding Ronald Coase's boundaries of the firm (Coase, 1937). The development of systemic innovations, which are key elements of digital transformation, is traditionally associated with significant difficulties: high uncertainty, unforeseen circumstances, and, crucially, the need to coordinate highly specialized assets (Dattée et al., 2018; Kapoor, 2018; Teece, 1984). The classical solution to these problems is vertical integration, which provides hierarchical coordination and protection against the risks of contract renegotiation (Williamson, 1985). However, digital ecosystems offer a qualitatively different mechanism: the leveling of transaction costs related to information and property rights (Kuzminov et al., 2026).

Recent scholarship critically re-evaluates classical institutional economics in light of digital transformation, emphasizing the evolution of transaction costs and governance structures. Avdasheva and Geliskhanov (2025), drawing lessons from historical reforms in network industries and post-socialist transitions, argue that digital platforms function as hybrid governance structures that radically alter transaction costs associated with information, quality assessment, and enforcement. Their work highlights how digitalization necessitates adaptive governance and institutional development to manage strategic interdependencies and transaction hazards, mirroring the challenges faced in liberalizing infrastructure networks. They underline that contractual mechanisms within ecosystems are critical tools for redefining market boundaries and ensuring non-discriminatory access, thereby enabling economically feasible transactions where traditional markets might fail. Furthermore, Nagle et al. (2025) underscore the enduring relevance of TCE for analyzing the digital economy, proposing a research agenda that probes the unique boundary conditions presented by digital transactions in defining firm-market relationships, including the positive externalities of platforms.

In the context of digital platforms and ecosystems, externalities manifest themselves in the form of indirect network effects: one user's decision to join the platform influences the benefits received by other participants (Rochet and

[3] A digital ecosystem is understood as a digital platform or a set of technologically and/or organizationally linked digital platforms that, by using a consolidated database together with technological and organizational solutions, enable their users to create additional consumer value when acquiring goods, works and services within such an ecosystem.

Tirole, 2003, 2006). Since individual actors do not account for these cross-side benefits, market failures arise, expressed as suboptimal pricing or insufficient market adoption (Katz and Shapiro, 1992). Here, the managerial role of digital platforms becomes critically important (Boudreau and Hagiu, 2009): they do not merely moderate prices, but establish rules and constraints, internalizing externalities and overcoming "matching failures." Empirical studies in the information and communication technology (ICT), media, and payment systems sectors (Evans et al., 2008; Seamans and Zhu, 2014) confirm that the platform's value to the user is determined precisely by the quality of access one side of the market has to the other.

At the same time, positive externalities of the digital economy can be identified on the producer side. They are linked to the expansion of accessible effective demand (both through information and simplified transactions) and a sharp reduction in transaction costs related to information (costs of searching, analyzing price offers, and selection) and property rights (costs of price negotiation, deal conclusion, contract formalization, guaranteeing remuneration transfer, and product delivery and its conformity to agreed parameters; Adner, 2017; Foss et al., 2023; Jacobides et al., 2018; Parker et al., 2017).

Another manifestation of the blurring boundary between the organization (firm) and the market is the replacement of employed workers by self-employed individuals. The advantage of algorithmic control over managerial control lies in its speed, cost-effectiveness, and the absence of control delegation to specialized agents (Khanagha et al., 2022). This is particularly evident in the ease with which digital service platforms (primarily ride-sharing, but also domestic services) accommodate labor arrangements such as part-time employment and flexible working hours, whereas traditional employment relationships typically exclude potential workers with such constraints. Although we do not explicitly analyze producers and the employed in the empirical part of the article, this clarification is important from the perspective of market balancing.

Returning to Coase's views, we may say that, whereas in the classical 1937 model the firm's existence is justified only as long as internal governance costs are lower than external transaction costs, the digital ecosystem effectively nullifies this institutional limit. It reduces external transaction costs to a level where the boundary between the organization and the market blurs, giving rise to the phenomenon of the "firm–market." In this structure, control is exercised not through directives, but through algorithms and interfaces. Looking ahead, we should note that this statement is supported by our empirical data: for about 65% of paid-subscription users, cost savings are a leading motive for subscription use. This indicates that the ecosystem successfully translates technological efficiency into economic benefits for the user, providing what can be termed demand-side economies of scale.

The macroeconomic mechanism of this transformation and the demand-side economies of scale are corroborated by Schwark and Tryphonides (2025), who study the impact of digitalization on the production function. A high concentration of IT capital and software within ecosystems provides exceptional elasticity of substitution among production factors, allowing managerial systems, physical assets and labor inputs to be instantaneously replaced by digital algorithms (of course, not in physical units, but in monetary or relative physical quantities vis-à-vis other components). Such Hicks-neutral technical progress implies that an efficiency increase propagates simultaneously across the entire value-creation chain.

Translating these findings into the legal domain requires the formation of a new system of legal determinants based on the concept of an "engagement ecosystem" (Morgan-Thomas et al., 2020). It is important to consider what constitutes a loyalty factor for a given digital ecosystem — namely, the user's saving of time and cognitive effort. As long as the user does not develop expectations of a materially larger gain (a trigger might be the lack of a particular product in the ecosystem or a high price that prompts the user to explore alternative ecosystems), the user remains within their preferred digital ecosystem. The "comfort zone" for particular social groups may be the subject of a dedicated study; it may form the basis of the market behavior of a digital ecosystem and its participants (Baldus et al., 2015; Dessart et al., 2016; Wirtz et al., 2013).

Having reviewed the main theories related to digital platforms and ecosystems, we should note that our study introduces the concept of the non-discriminatory storefront to conceptualize digital ecosystems — a term already used above that requires further elaboration. The term is not entirely novel; rather, it synthesizes and develops key ideas present in current economic thought that analyze the nature of digital markets and their contribution to social welfare. We will highlight three key studies that theoretically confirm our hypothesis that non-discriminatory storefronts constitute the core of digital platforms and ecosystems.

We should clarify the meaning of the term non-discriminatory storefront used in this study. In the context of the present research, such a storefront is a functional element of a digital platform or ecosystem designed to aggregate, to systematically display and to enable interactive comparison of numerous market offers from different market actors in real time. Its purpose is to minimize informational transaction costs for the consumer and to reduce information asymmetry through the application of principles of algorithmic neutrality, transparency and equal access to the presentation of offers, excluding artificial preferences or constraints. Thus, a storefront here is understood as a principle of interface organization and a set of interaction rules, rather than as an independent digital platform or a discrete commercial service. The multiplicity of such storefronts within a single ecosystem is permissible, provided the declared criteria of non-discrimination are maintained; the criteria will be discussed in the final part of the article concerning the legal aspects of the issue.

From the perspective of network analysis, a "non-discriminatory storefront" can be represented as a fully connected graph (clique), where each node (offer) has a direct edge to all others. This topology reflects minimal informational transaction costs and allows the consumer to perform interactive comparisons. Such a topology, being devoid of central nodes or hierarchical structures, implicitly assumes algorithmic neutrality and the equitable representation of all participants within this interface space (see Fig. 1).

We should return to the question of how to demonstrate (or substantiate) theoretically the character of such non-discriminatory behavior in the economic sense. The fundamental question about the mechanisms of value creation and coordination in digital ecosystems is addressed in the work of Foss et al. (2023). They conceptualize an ecosystem as a specific governance structure designed to ensure and sustain coordination and cooperation among many independent economic agents united by a common innovative value proposition. The authors argue that the traditional market pricing mechanism often fails to solve coordina-

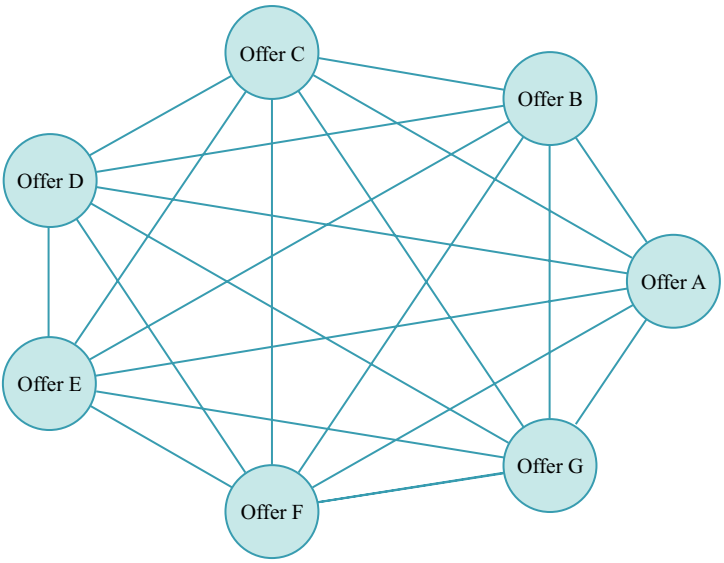

Fig. 1. Graph representation of the "non-discriminatory storefront" concept in terms of the authors' definition.

Source: Compiled by the authors.

tion and cooperation problems efficiently. Overcoming these barriers requires active "ecosystem leadership," implemented through dynamic capabilities — sensing opportunities, mobilizing investments (seizing), and continuously adapting the system (reconfiguring). Ecosystem leaders create value not only through their own innovations, but also by substantially reducing transaction costs for all participants, which is critical for the successful functioning and scaling of the ecosystem. Thus, the ecosystem operates as an effective institution capable of organizing complex innovation processes that neither a pure market nor a traditional hierarchical firm can handle.

This approach to organization and governance substantially transforms the character of competition, rendering inadequate the static regulatory models focused on monopoly power. Petit and Teece (2021) criticize the application of classical monopoly models to large technology firms. They argue that the growth and diversification of these companies' services lead not to static monopoly but to cross-industry competition spanning many very different markets. In this regard, Petit and Teece propose a new conceptualization of the firm as a Schumpeterian innovation unit based on dynamic capabilities, and they call for a revision of competition policy toward the long-term welfare of consumers that fosters innovation. This dynamic perspective acknowledges that the scale and integration of ecosystems are not signs of static dominance but the result of effectively solved coordination and value-creation problems in the constant competition for consumer attention and time share.

The ultimate result of these dynamic processes of coordination and competition, as shown by Brynjolfsson et al. (2018), is a substantial increase in consumer welfare that, however, is poorly captured by traditional systems of national accounting. In the context of the digital economy, characterized by the spread of new and so-called "free" goods and services as well as rapid quality improvements, a significant gap emerges between contribution to GDP and the real improvement in welfare. To

measure it, the authors propose the GDP-B metric, which takes these unrecorded gains into account. It is precisely price reductions, time savings, the minimization of physical movements, access to a wide spectrum of goods, and the provision of "free" services that are direct consequences of effective managerial leadership within ecosystems and their capacity to ensure dynamic competition. These real, yet often invisible, economic benefits for citizens form the basis for a new understanding of the value created by digital ecosystems. In essence, the authors write about the digital consumer surplus. They demonstrate that owing to non-monetary gains and time savings, digital goods generate real welfare that is not recorded by conventional national accounting methods, but in practice makes the population's "economic life" better even amid stagnant nominal incomes.

Taken together, these three studies allow us to assert that a non-discriminatory storefront indeed exists, i.e., its existence can be theoretically substantiated. At the same time, it should be noted that there is another strand of the literature that does not support the idea of non-discrimination. This body of work, largely regulatory in orientation, focuses exclusively on problems arising from scale. Relations between platform owners and other economic actors are often viewed through the lens of classical antitrust concerns (Orbach, 2014; Peitz, 2020). Particular attention is paid to the formation of monopolies (Xing and Sharif, 2020) and market dominance (Khan, 2017; Srinivasan, 2019, 2020).

In response to these concerns, a broad range of regulatory measures has been proposed (Gleiss et al., 2023), varying from "soft" instruments — fiscal assessment of data (Ben-Shahar, 2017), labor regulation (Rogers, 2016) and infrastructure policy (Rahman, 2018); algorithmic and pricing regulation (Di Porto and Zuppetta, 2021; Loertscher and Marx, 2020) and ensuring interoperability (De Hert et al., 2018) — to more radical interventions, such as algorithmic disclosure (Gal and Petit, 2021) or structural separation of infrastructures (Khan, 2019).

However, these proposals, which draw on lessons from regulation of traditional network and utility sectors (Montero and Finger, 2021), are only partially applicable to digital ecosystems and platforms (Staab, 2019), since they ignore the "deflationary effect of digital optimization" and the mechanisms that generate digital consumer surplus described above. The application of traditional norms, operating with concepts of market turnover and market share, carries a high risk of destroying positive externalities and even the very existence of non-discriminatory storefronts.

How can the two approaches, namely, recognizing ecosystems' positive externalities and scrutinizing their scale, be reconciled? If an ecosystem, by virtue of its scale, demonstrably generates time and monetary savings for the population and can be characterized as a non-discriminatory storefront, then its size alone should not be qualified as a legal infringement. Accordingly, it is necessary to develop a legal definition of an ecosystem as an organizational-technological complex, characterized by a high elasticity of substitution among production factors and by its ability to increase consumer welfare through unified data accumulation. Regulatory policy within this paradigm should shift from protecting abstract competitors to protecting consumption efficiency, acknowledging the scale of ecosystems as a legitimate instrument for maximizing public welfare in the new technological reality. For the practical applicability of this article's conclusions, it is important to evaluate whether such effects are being observed in Russia.

3. Data

The empirical analysis uses data collected within the Household Economic Behavior project of HSE University. The project's representative population survey covers Russian residents aged 18 and older and uses a multistage stratified probability design with quotas aligned to federal district, settlement type, age, and sex; interviews are conducted using computer-assisted web interviewing (CAWI). The dataset used in this article contains 3,026 respondents from a 2025 data collection. Because the survey uses a multistage stratified design, a simple-random-sample margin of error is not reported; sampling uncertainty depends on the survey design. The empirical results below therefore report the exact number of respondents used in each model after excluding observations with missing information on the variables required for that specification.

The empirical analysis follows a three-stage sequential strategy that separates access, motivation, and diversification/retention behavior. In Stage 1, Model 1 examines socio-demographic correlates of paid-subscription use in the broader respondent sample. In Stage 2, Models 2–8 are estimated only among paid-subscription users because their dependent variables describe motives for subscription use. In Stage 3, Model 9 uses the same subscriber sample to examine how motives and socio-demographic characteristics are associated with the frequency of third-party subscriptions. This sequence is analytical rather than hierarchical: each stage answers a different empirical question, and no multilevel structure is imposed.

The original dataset contains 3,026 respondents. Model 1 is estimated on 2,795 respondents with complete information on all variables required for the specification. Models 2–9 concern subscription motives and third-party subscription behavior and are therefore restricted to respondents who use paid subscriptions; after excluding respondents with missing information on the variables used in these models, this subsample contains 1,319 respondents. Restricting Stages 2 and 3 to subscribers is dictated by the questionnaire structure and the substantive meaning of the dependent variables; it is not treated as a solution to endogeneity. The survey design reduces the platform-specific selection problem that would arise from studying the customer base of a single platform, but the estimates remain associational. For Model 9, the IIA assumption is acknowledged as a standard limitation of the multinomial logit specification rather than as a feature of digital interface architecture.

The empirical models operationalize separate observable dimensions related to the paper's theoretical constructs. Model 1 tests whether settlement type is conditionally associated with paid-subscription use; the absence of a statistically significant settlement-size gradient is interpreted as evidence consistent with the geographic-access dimension of a non-discriminatory storefront, not as proof that all forms of discrimination are absent. Models 2–8 examine non-monetary and monetary motives for subscription use, including cost savings, convenience, and trust. Model 9 then links these motives to third-party subscription behavior. Together, the models provide a structured empirical assessment of access, perceived consumer value, and ecosystem loyalty/diversification.

The data show that the penetration of online shopping into Russian consumers' everyday lives is substantial: 36.1% of respondents make online purchases once or several times a week, and a further 42.4% do so once or several times a month.

Moreover, among the most affluent groups (with incomes above 200,000 rubles per month), online purchases are a daily practice for 20.0% of respondents. These figures indicate deep integration of digital platforms into consumer behavior and their role in forming new consumption patterns, consistent with what Jacobides et al. (2024) noted on the transformation of traditional economic interactions under the influence of digital ecosystems.

The analysis of perceived advantages of online shopping compared with offline formats directly supports the hypothesis that platforms create a meaningful consumer surplus. The most frequently mentioned benefit is time savings, cited by 58.1% of the respondents. Notably, this share reaches 61.3% for residents of cities with populations of 250–500 thousand, and 67.7% for the respondents with monthly incomes of 100,001–150,000 rubles. This evidence suggests that digital platforms effectively level geographic and temporal barriers, freeing valuable consumer resources, which is a manifestation of the "deflationary effect of digital optimization."

The second most important advantage is a wider assortment of goods and services, noted by 53.9% of the respondents nationwide. In cities of 250–500 thousand inhabitants this figure rises to 55.9%. Particularly telling is the fact that within the highest income decile (over 200,000 rubles per month) this factor is critically important for 63.3% of respondents. This indicates that digital platforms not only expand access to goods, but also satisfy growing demand for variety, corroborating the statement by Pousttchi et al. (2019) that digital platforms change how value is created and value propositions are formed.

Lower prices were named as an advantage by 46.2% of the respondents. This factor is most valued by residents of cities with populations of 100–250 thousand (48.0%), and by people with middle incomes (60,001–80,000 rubles per month); among the latter it is chosen by 53.6%. This result is a direct empirical confirmation of the "deflationary effect of digital optimization," whereby platforms' technological efficiency is translated into savings for the end consumer. Additionally, more numerous discounts and promotions are highlighted by 43.3% of Moscow residents and 43.4% of the residents of cities with populations of 250–500 thousand. Interestingly, this factor is most significant for the wealthiest group (53.3% in the income bracket above 200,000 rubles), which may be explained by their high activity and experience in using platforms to optimize expenditures and maximize digital consumer surplus. Thus, the present data convincingly demonstrate that significant non-monetary effects of improved access to goods are already manifesting themselves even at the level of individual digital platforms (marketplaces and classifieds).

Such effects as time savings, expanded choice, and price reductions correspond directly to the concept of digital consumer surplus described by Brynjolfsson et al. (2018). For consumers, these advantages themselves form the perception of an integrated service, in which benefits from one element are amplified by others, moving the user closer to experiencing the ecosystem effect. This also indirectly supports the claim by Khanagha et al. (2022) that algorithmic control and process optimization on digital platforms make efficient handling of complex coordination tasks possible, transforming the consumer experience.

The regression analysis therefore proceeds from access (Model 1) to motives among paid-subscription users (Models 2–8), and finally to diversification and

retention behavior (Model 9). This structure allows the empirical claims to be tied to the specific model in which each association is estimated.

In Stage 1, Model 1 estimates a binary logistic regression for paid-subscription use using gender, age, settlement type, education, the presence of children under 18, and household income as predictors (see Tables 1 and 2). The model is specified as follows:

$$P(Y = 1) = \frac{1}{1 + e^{-X\beta}}, \quad (1)$$

where $P(Y = 1)$ is the probability of using a paid subscription; X is the vector of socio-demographic characteristics; and β is the vector of estimated coefficients.

Model 1 has pseudo $R^2 = 0.092$ and MSE = 0.219. These statistics are reported as descriptive measures of fit rather than as evidence of a particular threshold of predictive performance. Age is strongly and negatively associated with paid-subscription use: the average marginal effect implies that an additional year of age is associated with a 0.94 p.p. lower probability of subscription ($p < 0.001$).

Table 1
Socio-demographic drivers of respondents' engagement in ecosystem subscriptions.

Variable	Model 1
	Dependent variable
	Paid subscriptions
Intercept	0.7206**
Gender	–0.1823*
Age	–0.0431***
Settlement type	–0.0041
Education level	0.0995*
Number of children under 18 years old	0.2052*
Income of household	0.1357***
Log-Likelihood	–1755.2
MSE	0.219
Pseudo R^2	0.092

Note: Model 1 is estimated on 2,795 respondents with complete information on all variables required for the specification. Gender is coded 1 = male and 0 = female; higher settlement-type values denote larger settlements. *** $p < 0.001$, ** $0.001 \le p < 0.01$, * $0.01 \le p < 0.05$, † $0.05 \le p < 0.10$.
Source: Compiled by the authors.

Table 2
Marginal effects for Model 1.

Variable	Model 1
	Dependent variable
	Paid subscriptions
Gender	–0.0399*
Age	–0.0094***
Settlement type	–0.0009
Education level	0.0218*
Number of children under 18 years old	0.0449*
Income of household	0.0297***

Note: Average marginal effects for Model 1. The model uses the same 2,795 respondents as in Table 1. Gender is coded 1 = male and 0 = female; higher settlement-type values denote larger settlements. *** $p < 0.001$, ** $0.001 \le p < 0.01$, * $0.01 \le p < 0.05$, † $0.05 \le p < 0.10$.
Source: Compiled by the authors.

Gender is also significant: because gender is coded 1 for men and 0 for women, the negative marginal effect implies that women have, on average, an approximately 4 p.p. higher probability of using paid subscriptions than men, conditional on the other covariates ($p = 0.027$).

Economic affordability and accumulated cultural capital likewise emerge as significant drivers of consumption. Statistically, a one-category increase in the household-income scale and in the education scale is associated with increases of 2.97 and 2.18 p.p., respectively, in the probability of holding a paid subscription. Furthermore, the presence of children in the household constitutes an additional engagement factor, increasing subscription probability by 4.5 p.p. ($p = 0.018$), which indirectly underscores the role of family- and children-oriented content within the overall consumption structure.

For the geographic-access question, the key result is the absence of a statistically significant association between settlement type and paid-subscription use (average marginal effect = −0.0009, $p = 0.881$). Conditional on age, gender, education, children, and household income, the data therefore do not reveal a settlement-size gradient in subscription probability. This result is consistent with the geographic-access dimension of the Non-Discriminatory Storefront concept. At the same time, income and education remain statistically significant, so the result should not be interpreted as evidence that socioeconomic inequalities in digital consumption have disappeared.

The accessibility of goods is facilitated through two mechanisms. First, the informational aggregation of offers helps overcome prohibitive informational transaction costs. Second, a logistics system (comprising warehousing and delivery), being either an integral part of a solid ecosystem (Wildberries, Ozon, Yandex) or an independent agent (CDEK), overcomes prohibitive transport costs that are compounded by associated informational and property-rights transaction costs.

The absence of a settlement-size gradient in Model 1 does not imply homogeneity within the group of active consumers. Subscription users may differ in why they value ecosystem services and in whether they diversify beyond their primary ecosystem. Stages 2 and 3 therefore focus on paid-subscription users in order to analyze outcomes that are defined only for this group. This restriction improves substantive comparability within the relevant population but does not eliminate unobserved heterogeneity or endogeneity.

In Stage 2, Models 2–8 examine heterogeneity in the motives reported by paid-subscription users (Table 3). Each motive is modeled separately with a binary logit using the same socio-demographic predictors as in Model 1. The sample contains 1,319 paid-subscription users with complete information on the variables used in these models. Average marginal effects (*ME*) are reported to facilitate interpretation across predictors within each specification and are computed as follows:

$$ME = \frac{\partial P(Y = 1)}{\partial X}. \tag{2}$$

Analysis of subscription motives confirms the central role of economic considerations. In the Stage 2 subscriber sample, the “Cost savings” motive was selected by 65.3% of respondents and was the sole reported motive for 28.4%. In Model 2, age is negatively associated with selecting cost savings (average mar-

Table 3
Marginal effects: Motives for paid subscription use.

Variable	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
	Dependent variables						
	Cost savings	Bonuses and cashback	Convenience (single account)	Ease of switching	Trust in company	Time savings	Family subscription benefits
Gender	0.0201	–0.0280	–0.0204	–0.0064	–0.0013	0.0231	–0.0435*
Age	–0.0032**	0.0009	–0.0028**	–0.0006	–0.0014	0.0005	0.0011
Settlement type	–0.0006	–0.0016	0.0027	–0.0060	0.0160*	–0.0039	0.0079
Education level	–0.0172	–0.0086	–0.0004	0.0116	0.0064	0.0015	0.0034
Number of children under 18 years old	0.0471†	0.0117	–0.0134	–0.0169	–0.0367	0.0094	–0.0253
Income of household	–0.0064	0.0122**	0.0201***	0.0065†	0.0050	0.0022	–0.0019

Note: Models 2–8 are separate binary logit models estimated on 1,319 paid-subscription users with complete information on the variables used in the subscriber analysis. The dependent variables are motives for subscription use and are observed only for paid-subscription users. Entries are average marginal effects. Log-Likelihood and pseudo R^2 are omitted for compactness because the seven columns have different dependent variables and their pseudo R^2 values are not directly comparable across outcomes. *** $p < 0.001$, ** $0.001 \le p < 0.01$, * $0.01 \le p < 0.05$, † $0.05 \le p < 0.10$.
Source: Compiled by the authors.

ginal effect = −0.0032, $p = 0.002$), indicating a stronger orientation toward price benefits among younger users. The other socio-demographic predictors are not statistically significant at the 5% level for this motive. Thus, apart from the age gradient, cost savings are broadly distributed across the socio-demographic groups represented in the model.

Other motives display more specific socio-demographic patterns. In Model 3, higher household income is positively associated with selecting "Bonuses and cashback" (average marginal effect = 0.0122, $p = 0.004$). In Model 4, higher income is also positively associated with "Convenience (single account)" (average marginal effect = 0.0201, $p < 0.001$), while age is negatively associated with this motive (average marginal effect = −0.0028, $p = 0.005$). These results indicate that higher-income users place relatively greater weight on additional benefits and convenience. By contrast, household income is not significantly associated with "Trust in company" in Model 6 (average marginal effect = 0.0050, $p = 0.262$). Trust is positively associated with settlement size (average marginal effect = 0.0160, $p = 0.024$), indicating a higher probability of reporting trust as a motive among respondents in larger settlements.

In Stage 3, Model 9 examines diversification beyond the primary ecosystem using a multinomial logistic regression for the frequency of third-party subscriptions (never, occasionally, frequently), with "never" as the reference category. The predictors include the socio-demographic variables and all seven subscription motives used in Models 2–8 (Table 4). The model is specified as follows:

$$P(Y = k|X) = \frac{e^{X\beta_k}}{1 + \sum_{j=1}^{K} e^{X\beta_j}}. \quad (3)$$

where $P(Y = k|X)$ is the probability that respondent j, given the vector of predictors X_j, belongs to outcome category k; β_k is the vector of estimated coefficients

Table 4
Determinants of the frequency of subscribing to third-party services.

Variable / motive	Model 9	
	Frequency of subscribing to third-party services (Reference category: Never subscribed)	
	Occasionally subscribed	Frequently subscribed
Intercept	0.2408	0.6256
Gender	0.0939	0.6252**
Age	–0.0169***	–0.0741***
Settlement type	0.0329	0.0239
Education level	–0.0979	–0.0374
Number of children under 18 years old	0.2253†	0.4857*
Income of household	–0.0433†	–0.0155
Cost savings	0.1999	–0.3522
Bonuses and cashback	0.5210**	1.0662***
Convenience (single account)	–0.1501	–0.3777
Ease of switching	0.4303*	0.4987†
Trust in company	–0.0716	–0.6413*
Time savings	0.2724	–0.6438
Family subscription benefits	–0.0747	–0.6306
Log-Likelihood	–1093.2	
Pseudo R^2	0.057	

Note: Model 9 is estimated on the same 1,319 paid-subscription users as Models 2–8. The dependent variable is the frequency of third-party subscriptions: never (reference category), occasionally, or frequently. Coefficients are multinomial-logit coefficients relative to the reference category. Gender is coded 1 = male and 0 = female; higher settlement-type values denote larger settlements. *** $p < 0.001$, ** $0.001 \le p < 0.01$, * $0.01 \le p < 0.05$, † $0.05 \le p < 0.10$.
Source: Compiled by the authors.

for category k. In Model 9, k denotes "never," "occasionally," or "frequently," with "never" used as the reference category.

It is worth noting separately that over half (54.8%) of users have not subscribed to any additional third-party services outside their primary ecosystem in the past year. This pattern holds true across all income groups examined without exception. Among respondents who did acquire additional subscriptions, the largest share (30.5%) opted for streaming services. Notably, the most prevalent reason (36.7%) for deciding to purchase an additional subscription was the absence of desired content or functionality within their main subscription.

Model 9 reveals distinct correlates of diversification beyond the primary ecosystem. "Trust in company" is negatively associated with frequent third-party subscriptions relative to never subscribing to third-party services ($\beta = -0.6413$, $p = 0.044$). This pattern is consistent with trust-based ecosystem loyalty or retention, but it does not imply that trust is stronger among higher-income users. Conversely, "Bonuses and cashback" is positively associated with both occasional third-party subscriptions ($\beta = 0.5210$, $p = 0.001$) and frequent third-party subscriptions ($\beta = 1.0662$, $p < 0.001$), suggesting active cross-platform optimization among users motivated by promotional benefits. Ease of switching is positively associated with occasional third-party subscriptions ($\beta = 0.4303$, $p = 0.014$). The presence of children is positively associated with frequent third-party subscriptions ($\beta = 0.4857$, $p = 0.042$) as male gender ($\beta = 0.6252$, $p = 0.007$). Convenience, by contrast, is not significantly associated with third-party subscription frequency in Model 9 and is

therefore interpreted as a subscription motive rather than as direct evidence of retention.

Taken together, the three stages reveal different dimensions of ecosystem consumption. Model 1 indicates no settlement-size gradient in paid-subscription access after controls, while income and education remain relevant. Models 2–8 show that cost savings are broadly distributed apart from an age gradient, whereas bonuses/cashback and convenience are more strongly associated with higher income. Model 9 then identifies a behavioral distinction between trust-based ecosystem loyalty and benefit-seeking diversification: trust is associated with a lower likelihood of frequent third-party subscriptions, whereas bonuses/cashback are associated with greater diversification. These results are complementary and should not be interpreted as a single causal chain.

4. Legal characteristics of a non-discriminatory storefront

An important implication of this study is that the non-discriminatory storefront should — alongside its economic (or user-perceived) attributes — be given a formal legal definition. On the one hand, such a definition establishes a test for assessing whether a platform's behavior towards consumers aligns with non-discrimination principles; on the other hand, it serves as a constraint against market monopolization by leading platforms.

For legal analysis, an internet storefront is defined as an audiovisual element of a digital platform, including those within a digital ecosystem, which enables users to search for and review information about goods, works, and services so as to facilitate an informed choice. In essence, a storefront is a technological instrument (a software product, a web resource or a component thereof) designed to present goods and is equipped with algorithms for systematization, ranking and displaying search results.

Consequently, establishing an appropriate legal regime for digital platforms and ecosystems is necessary to mandate and safeguard the non-discriminatory character of the internet storefronts. The objective of such regulation is to ensure the equality of economic actors regardless of their size or the method of offering goods, works, or services to consumers.

First, legal obligations should be established for digital platforms and ecosystems to present a minimum set of information on their storefronts concerning the goods, works, and services offered, which would be analogous to the information duties imposed on traditional "offline" retailers and service providers. Fundamentally, this constitutes a direct consumer-protection measure designed to address the position of the user as the weaker party in the tripartite "business partner–platform (ecosystem)–user" relationship.

The Russian legislator, in Article 7 of the 2025 Federal Law on the Platform Economy,[4] has established minimum product-card requirements drawn from consumer protection legislation, alongside additional data mandatory for the digital environment, such as license, permit, manufacturer, country of origin, and the like. While this measure is positive, it remains insufficient to ensure a user's

[4] Federal Law No. 289-FZ of 31 July 2025 "On Certain Issues of Regulation of the Platform Economy in the Russian Federation."

ability to independently compare (and choose) goods, works, and services on different digital platforms.[5] To address this gap, legislation should mandate a minimum set of product or service information to be displayed in search results and on the product card itself. Furthermore, it should explicitly prohibit restricting a consumer's access to product (work or service) information and providing false information. Liability for violations of these provisions should be joint and several between the business user and the digital platform (ecosystem). Collectively, these stringent measures are necessary to protect the consumer who occupies the most vulnerable position in the "business partner–platform (ecosystem)–user" relationship.

Second, the issue concerns non-discrimination toward the business partners of a digital ecosystem or platform, specifically as regards such algorithmic functions as search-results output (including algorithms for targeted presentation or advertising of goods and services on an internet storefront), and dynamic pricing (the use of algorithms to adjust prices based on external prices). Currently, many digital platforms and ecosystems possess the ability to manipulate markets by controlling product visibility on the internet storefront (without providing users with configurable selection options), which directly influences and may distort consumer demand.

Foreign legislators have addressed the prohibition of discrimination against business partners primarily by mandating transparency in search-ranking algorithms and restricting manipulation of search results. The European Union's approach, exemplified in Article 5 of Regulation (EU) 2019/1150,[6] requires platforms to provide a fair, clear and detailed explanation of the main parameters determining the ranking or visibility of a business user's offers. This directly targets the "risks of opacity" — the inability of business users to optimize their presence given the lack of information about ranking criteria. In contrast, the legislative approach in the People's Republic of China, articulated in Article 28 of the Measures for the Supervision and Administration of Online Trading Platforms (hereinafter, the Measures (PRC) 2025),[7] imposes broader obligations concerning algorithmic transparency and reduction of discriminatory factors. The key provision prohibits charging fees for preferential search rankings to the detriment of other business

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[5] In this instance, it appears most appropriate to require that a platform operator, by means of its own platform rules, shall establish a minimum set of information about a product or service that a consumer can readily discover without additional search effort (including a prohibition on presenting such information in fine print, and requirements as to its visibility and completeness). With respect to a product, such information should at minimum include its key characteristics, namely: the product name, composition, manufacturer, place of manufacture, any licenses or permits, expiry date (shelf life), storage conditions, unit price, delivery timeframe, and any applicable delivery restrictions (including restrictions applicable to cross-border deliveries). With respect to a service, the information should include the list (description) of services, the place of provision, duration, opening hours, and any licenses or permits. In other words, the formalized requirements concerning the set of information to be provided to consumers — as contained in rules governing trade at stationary premises and in rules for provision of services at on-site locations — should, as regards the volume of information, be aligned as closely as possible with the rules for the placement of information about such goods and services when distributed via digital platforms (ecosystems).

[6] P2B Regulation (EU) 2019/1150. https://eur-lex.europa.eu/eli/reg/2019/1150/oj/eng

[7] Measures for the Supervision and Administration of Online Trading Platforms, jointly promulgated by the State Administration for Market Regulation (SAMR) and the Cyberspace Administration of China (CAC), December 18, 2025. https://www.samr.gov.cn/zw/zfxxgk/fdzdgknr/fgs/art/2026/art_85b474fc5a08494bb60ca6a280b98d7d.html (in Chinese).

users, thereby reinforcing the principles established by Articles 9, 14, and 15 of China's Anti-Monopoly Guidelines for the Platform Economy.[8]

Third, the use of manipulative interface design (dark patterns) and the generation of targeted price offers based on consumer behavior and user preferences should be subject to clear transparency requirements, especially where elevated visibility may be mistaken for neutral search output. The EU GDPR does not establish a general right to be free from price discrimination. Rather, Articles 12–14 establish transparency obligations concerning the processing of personal data, while Article 22 regulates decisions based solely on automated processing, including profiling, when they produce legal or similarly significant effects; Recital 71 further describes safeguards relevant to profiling and automated decision-making. These provisions may therefore be relevant to personalized pricing and targeting when their conditions are met, but they should not be presented as a general prohibition of differential pricing. By contrast, the Chinese Measures (PRC) 2025 provide more direct restrictions: Article 30(2) limits practices that exclude or restrict consumers' independent choice, and Article 31 prohibits using personal data to set differential prices or fees for identical goods or services for different consumers.

The Russian legislator, in Article 10 of the Federal Law on the Platform Economy (2025), has taken a contradictory stance: it explicitly permits platforms to charge fees for elevated search rankings (which discriminates against small manufacturers and sellers). However, it prohibits platforms from manipulating search results in response to a user's request to sort goods by consumer-defined criteria (e.g., price or rating). To resolve this inconsistency, the state should additionally establish paternalistic measures to protect the domestic market and provide further guarantees for small and medium-sized manufacturers and sellers.

Finally, the issue of self-preferencing. This involves a platform or ecosystem operator granting preferential access to its services within ranking algorithms, search results, and display visibility. Such conduct directly distorts competition, harming business users who depend on the aforementioned elements of the platform infrastructure. This issue is mainly addressed by the EU's Digital Markets Act (DMA).[9] Article 6(5) explicitly prohibits gatekeepers from granting "more favorable treatment" to their own services compared to similar third-party offerings in "ranking, visibility or access to data or functionality." The landmark antitrust case of the European Commission against Google exemplifies the severity of such violations: the company was fined nearly 3 billion euros for illegally prioritizing its own online advertising services over competitors.[10]

This principle extends to preferential promotional opportunities within a digital ecosystem through in-app advertising and attention-capturing widgets. Targeted placement based on user-behavior analysis may raise competition concerns when it systematically privileges the ecosystem operator's own services. In the Russian context, the 2021 FAS warning to Yandex concerning so-called

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[8] Anti-Monopoly Guidelines for the Platform Economy, promulgated by the State Administration for Market Regulation (SAMR) of the People's Republic of China, February 7, 2021. https://scjgj.cq.gov.cn/zt_225/cjscjz/zcfg/gfxwj/202312/t20231215_12710745.html

[9] The Digital Markets Act, adopted by the European Parliament and the Council on 14 September 2022. https://digital-markets-act.ec.europa.eu/about-dma_en

[10] https://ec.europa.eu/commission/presscorner/detail/en/ip_25_1992

koldunshchiki (search wizards) is relevant to this issue. Its application within an ecosystem depends, inter alia, on the market position of the entity concerned. For non-dominant actors, personalization based on user data may remain a legitimate element of the ecosystem business model when it improves consumer navigation and complies with applicable requirements of good-faith customization and transparency. A blanket prohibition would risk treating ecosystem integration itself as unlawful rather than focusing on conduct that distorts competition.

5. Findings and discussion

The integration of empirical data with both fundamental and contemporary economic theory yields a multidimensional understanding of the digital ecosystem as a non-discriminatory storefront that functions without coercive mechanisms.

The results can first be related to Alfred Marshall's concept of consumer surplus, defined as the difference between the consumer's maximum willingness to pay and the actual market price (Marshall, 1890). In the subscriber sample, "Cost savings" is the most frequently selected motive (65.3%). This result is consistent with the proposition that bundled access can generate consumer gains when the subscription price is lower than the sum of separately purchased services. In the digital context, this conventional monetary channel coexists with non-monetary benefits such as time savings and broader choice, which connects the analysis to the GDP-B framework of Brynjolfsson et al. (2018).

From the perspective of Ronald Coase's theory, a firm exists to internalize transactions when doing so is cheaper than conducting them in the open market — that is, to economize on the costs of information search, negotiation, and contract enforcement. Digital ecosystems represent a unique institutional form that, in effect, transcends the Coasean boundary. For a consumer, they blur the distinction between a firm's internal processes and external market transactions, creating a hybrid space.

From a transaction-cost perspective, the empirical results also distinguish between motives for joining or valuing an ecosystem and behavior outside the primary ecosystem. Model 9 shows that "Trust in company" is negatively associated with frequent third-party subscriptions relative to never using third-party subscriptions ($\beta = -0.6413$, $p = 0.044$). We interpret this pattern as evidence consistent with trust-based ecosystem loyalty or retention. It should not be read as evidence that trust is especially strong among higher-income users: in Model 6, household income is not significantly associated with trust. Higher income is instead associated with bonuses/cashback (Model 3) and convenience of a single account (Model 4). Convenience is therefore treated as a valued attribute of ecosystem integration, not as an independently established determinant of retention.

The economic outcome of transaction-cost reduction may include positive externalities in the Pigouvian sense (Pigou, 1920), particularly where digital infrastructure expands information and geographic access beyond the direct bilateral transaction. In the present data, the strongest empirical result relevant to access is spatial rather than socioeconomic: settlement type is not significantly associated with paid-subscription use after controls.

The results are therefore consistent with a reduction in spatial barriers to digital consumption, but not with the elimination of socioeconomic inequality.

Model 1 shows that education and household income remain statistically significant correlates of paid-subscription use, whereas settlement type does not. The non-discriminatory storefront concept should accordingly be understood as multidimensional: evidence of geographic accessibility does not imply the absence of differentiation by resources, education, ranking practices, pricing, or other mechanisms.

The behavioral evidence is most clearly anchored in Model 9. Trust is associated with a lower likelihood of frequent third-party subscription use, which is consistent with trust-based retention within the ecosystem. Bonuses/cashback, by contrast, are associated with greater use of third-party subscriptions, consistent with active benefit-seeking across platforms. Convenience of a single account is important as a motive, especially among higher-income subscribers in Model 4, but its coefficients in Model 9 are not statistically significant; it is therefore not used as direct evidence of retention. Separately, the absence of a settlement-size effect in Model 1 supports the geographic-access component of institutional seamlessness, while leaving socioeconomic gradients intact.

Thus, the synthesis of classical and contemporary theories and the empirical results provides evidence consistent with the non-discriminatory storefront as an analytical model linking transaction-cost reduction, consumer value, and platform governance. The data do not establish that ecosystem retention results only from unconstrained utility maximization, nor do they rule out switching costs or discriminatory practices. Rather, they show that trust-based loyalty can coexist with active cross-platform diversification and that geographic access can coexist with income- and education-related differences. This more differentiated interpretation is important for competition-policy analysis.

Concurrently, the concept of a non-discriminatory storefront requires legal definition and operational criteria. The authors propose four directions for such a framework: (a) a minimum standard of information disclosure for goods, works, and services displayed on the internet storefront; (b) non-discriminatory rules for search ranking and pricing algorithms; (c) regulation of manipulative interface design (“dark patterns”) and transparency of personalized offers based on consumer behavior and user-experience data; and (d) restrictions on self-preferencing and preferential promotion of the platform operator’s own services. The regulatory objective is therefore to limit both self-preferencing in favor of the platform and discriminatory treatment of users or business partners, while preserving efficiency gains that arise from legitimate ecosystem integration.

6. Conclusion

This study develops the non-discriminatory storefront as a framework for evaluating digital ecosystems through consumer access, transaction-cost reduction, and platform conduct rather than through scale alone. The empirical analysis separates three questions. Model 1 addresses access and finds no statistically significant settlement-size gradient in paid-subscription use after controls, although income and education remain significant. Models 2–8 address motives among paid-subscription users and show that cost savings dominate, while higher income is associated with bonuses/cashback and convenience. Model 9 addresses diversification and retention behavior: trust is negatively associated with frequent

third-party subscriptions, whereas bonuses/cashback are associated with greater diversification across services.

These findings support a more conditional interpretation of ecosystem welfare effects. Geographic accessibility and transaction-cost savings can coexist with socioeconomic differentiation and with platform practices that require regulatory scrutiny. Accordingly, the proposed legal test focuses on information disclosure, ranking and pricing, manipulative interface design, and self-preferencing. Ecosystem scale should not by itself be treated either as a proof of monopoly harm or as evidence of consumer benefit; the relevant assessment is how scale, governance, and platform rules affect consumer welfare and the conditions of access for users and business partners.

The empirical results remain subject to the limitations of cross-sectional, predominantly categorical survey data and to the standard assumptions of logit and multinomial-logit models, including IIA for Model 9. Future research should test the framework using transaction-level and longitudinal data, direct measures of switching costs and platform ranking, and cross-country comparisons. Such evidence would make it possible to distinguish more sharply between efficiency-based ecosystem loyalty and retention generated by contractual, technological, or discriminatory barriers.

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