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## Electronic Property Registers as an Instrument for Reducing Transaction Costs: An Economic Analysis of Polish and Ukrainian Models

### • Abstract •

The article examines the role of electronic real estate registers as an institutional instrument for reducing transaction costs in property circulation through the lens of the economic analysis of law. Based on a comparative analysis of the Polish and Ukrainian models of real estate rights registration, the study reveals the impact of historical preconditions for the formation of private land ownership, the specifics of European integration, and contemporary challenges (in particular, the wartime factor in Ukraine) on the level of digitalization and institutional coherence of registry systems. It is substantiated that real estate registers perform not only a legal but also an economic function by reducing costs related to information search, verification of the legal status of property, conclusion and enforcement of contracts, as well as by lowering the level of legal uncertainty. The institutional architecture of cadastral and legal registers in Poland and Ukraine is analysed, with particular attention to mechanisms of inter-register interaction (the Integrated Real Estate Information System—ZSIN in Poland and the “Trembita” system in Ukraine) and their impact on the efficiency of property circulation. The article concludes that the key determinant of the economic efficiency of registration systems is not merely their electronic form, but primarily the degree of institutional integration and consistency of registry data. Special emphasis is placed on the prospects for further digital transformation of registers, in particular through the potential application of blockchain technologies as a tool for enhancing security and reducing transaction costs in the future.

**Keywords:** Real Estate Registers, Transaction Costs, Land Cadastre, State Registration of Real Rights, Economic Analysis of Law.

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## Introduction

The real estate registers are among the key institutional elements ensuring the functioning of the real estate market and the system of property rights protection in contemporary legal orders worldwide. Their significance goes far beyond the purely technical recording of property rights, as they form the foundation of legal certainty, reduce the level of information asymmetry, and ensure a certain predictability of property relations. For this reason, real estate registers function not only as legal, but primarily as economic instruments, without which efficient and transparent property circulation is impossible.

Legal institutions, when examined from the perspective of the economic analysis of law, are assessed through the prism of their ability to minimize transaction costs associated with information search, verification of rights, and the conclusion and enforcement of contracts. In this dimension, registers perform a fundamental function—they reduce the costs borne by market participants, limit legal risks, and contribute to the stability of economic relations. The existence of a publicly reliable property rights register enables parties to property transactions to make economically rational decisions without expending excessive resources on additional legal verification.

The information revolution driven by contemporary globalization processes has led to a transition from paper-based to electronic forms of register administration, as a result of which registers have acquired the characteristics of a fully-fledged market infrastructure mechanism that ensures legal protection and contributes to the stability and economic efficiency of property relations. Further enhancement of the interoperability of electronic registers will only strengthen their economic effect.

In this context, a comparative analysis of the experience and the current level of digitalization of electronic real estate registry systems in Poland and Ukraine is of particular scholarly interest. Poland is currently characterized by a higher level of digitalization and institutional coherence in the functioning of the real estate rights registration system (in particular, land and mortgage registers), whereas the Ukrainian system is undergoing a process of transformation. This creates a basis for analysing the potential economic benefits of the further development of electronic mechanisms for rights registration.

The purpose of this article is to examine electronic registers as an instrument for reducing transaction costs within the framework of the economic analysis of law, as well as to conduct a comparative assessment of the Polish and Ukrainian models from the perspective of their impact on legal certainty and the economic efficiency of property rights protection.

## Background of the Formation of the Institution of Private Land Ownership in Poland and Ukraine

Within the framework of institutional economics, according to North, the development of legal institutions is regarded as a historically conditioned process characterized by dependence on the previous trajectory of development (path dependence) (North, 1990, pp. 3–6). As North notes, institutions do not emerge *ex nihilo* (out of nothing), but are the result of gradual changes constrained by prior rules, practices, and models of economic interaction (North, 1990, pp. 7–8).

Based on the above, it can be argued that historical differences in the formation of the institution of private land ownership affect contemporary mechanisms for organizing real estate registration systems and the cost of their institutional modernization. Accordingly, the level of development and digitalization of land registers is largely determined by historical models of land relations and the establishment of the institution of private land ownership.

The current level of digitalization of Poland's electronic real estate registry systems is significantly higher than that of Ukraine; however, this primarily stems from different initial conditions. Thus, as noted in a special report by FAO (the Food and Agriculture Organization of the United Nations), during the communist regime in 1945–1989, three quarters of agricultural land in Poland remained in private family farms, although the development of these farms was constrained by ideological limitations, and only about one quarter of land was held by state farms or cooperatives.<sup>1</sup>

Whereas, according to Masel-Veseliak and Fedorov: “(...) only with the acquisition of state sovereignty and economic independence in Ukraine in 1990 did the transformation of the agrarian sector toward market-based economic conditions take place, involving a transition from the collective-state farm method of agricultural production, based on state ownership of land, to a mode of management built on private ownership of land combined with collective, individual, and family forms of labor organization” (Masel-Veseliak and Fedorov, 2025, p. 5). According to Karabin-Zyc and Kuryltsiv: “As a result of land reform, nearly 7 million Ukrainians became landowners, gaining the legal right to possess, manage, and use their land” (Karabin-Zych and Kuryltsiv, 2015, p. 56).

It follows that the countries under study had different starting conditions for the inclusion of property rights in land registers, as well as differing depths of

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<sup>1</sup> Food and Agriculture Organization of the United Nations. (n.d.). *Agricultural Policy. FAO Agricultural Policy and Economic Development Series No. 1*, Rome. Retrieved February 2, 2026, from: <https://openknowledge.fao.org/handle/20.500.14283/w7440e>

institutional memory. Ukraine underwent a “shock” transformation associated with a rupture in institutional tradition—from a collective farm model that presupposed the absence of private land ownership to mass and rapid privatization. This resulted in the fragmentation of rights, incomplete recording of information in land registers, and a gap between actual land use and the legal formalization of rights. In contrast, Poland was characterised by the preservation of the predominant share of land in private ownership even during the socialist period, which ensured the continuity of the institution of private property and formed a stable basis for the continuous maintenance of land registers, the preservation of registry data, and their subsequent transfer into new organizational and technological formats.

Another important difference between the two states lies in the different nature and chronology of their European integration. Poland acceded to the European Union on 1 May 2004, which necessitated the adaptation of national institutions, in particular the real estate and land rights registration system, to the requirements arising from EU law and the functioning of the internal market, especially in the areas of legal certainty, transparency, and efficiency of property circulation. By contrast, Ukraine articulated its European integration aspirations much later and only on 23 June 2022 acquired the status of a candidate for membership in the European Union, which objectively limited external incentives and institutional motivation for the systematic modernization of registry infrastructure over a prolonged period.

A separate factor that significantly affects the differences between the countries under study is the full-scale war waged by the Russian Federation against Ukraine. This factor has had a direct impact on the functioning of public institutions, in particular in the field of land and real estate rights registration. As is known, on 24 February 2022, state registers under the authority of the Ministry of Justice of Ukraine temporarily suspended their operation. According to Karabin-Zyc and Kuryltsiv, the full-scale armed aggression resulted in restrictions on access to certain registry data (concealment of cadastral numbers, replacement of precise addresses with regional identifiers) in order to prevent the adversary from using registry information for military purposes (Mesel-Veseliak and Fedorov, 2015, p. 65). This, obviously, increases the risks of legal uncertainty regarding objects located in temporarily occupied or hostilities-affected territories. Under such conditions, the deepening of register interoperability objectively receded into the background.

Thus, the wartime factor not only slowed the institutional development of Ukraine’s registry infrastructure but also deepened the differences between the countries under study in terms of stability, continuity, and economic efficiency of the functioning of land registers.

## **Institutional Organization of the Rights Registration System in Poland and Ukraine**

The institutional architecture of the registration of land and real estate data in Poland and Ukraine is built around the separation of two functional blocks: the cadastral (geoinformation) block and the legal block (registration of real rights). At the same time, the differences lie in the degree of normative “interconnection” between these blocks, the unity of their data, and the organizational mechanisms of information exchange, which directly affects the cost of verifying the legal status of real estate, the risks of legal uncertainty, and, consequently, transaction costs in property circulation.

In Poland, the cadastral segment of the real estate registration system is institutionally structured as the Land and Buildings Register (EGiB), which functions as a public information system intended for the collection, updating, and unified provision of data on land parcels, buildings, premises, as well as on entities related to these objects.<sup>2</sup> This understanding of cadastral registration is directly enshrined in the Act of 17 May 1989 Geodetic and Cartographic Law, which defines the legal foundations for the functioning of the register and its nationwide character. At the same time, the detailed scope of cadastral data, their structure, as well as the technical and organizational rules for maintaining the register are specified at the level of subordinate regulation, in particular in the Regulation of the Minister of Development, Labour and Technology of 27 July 2021 on the Land and Buildings Register, which establishes EGiB data standards and the procedure for their updating.<sup>3</sup>

The legal segment of the real estate registration system in Poland is ensured by land and mortgage registers, the functioning of which is regulated by the Act of 6 July 1982 on Land and Mortgage Registers and Mortgage.<sup>4</sup> A key element of the institutional logic of this system, in accordance with Article 5 of the said Act, is the principle of public reliance on entries in land registers, according to which, in the event of a discrepancy between the legal status recorded in the land register and the actual legal status, the law grants protection to a person who acquired a right acting in good faith and relying on the content of the register. The application of this principle results in land and mortgage registers in the Polish model performing not only an informational but also a stabilizing function, ensuring predictability and security of property circulation.

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<sup>2</sup> Act of 17 May 1989 Geodetic and Cartographic Law, Journal of Laws 1989, No. 30, item 163.

<sup>3</sup> Journal of Laws 2021, item 1390.

<sup>4</sup> Journal of Laws 1982, No. 19, item 147.

It is important to emphasise that the real estate cadastre and the land and mortgage registers are separate registers maintained by different authorities and performing distinct functions; therefore, the issue of consistency between their data is not resolved automatically. For this very reason, in order to institutionally ensure the exchange and reconciliation of information on real estate, Poland has been developing the Integrated Real Estate Information System (ZSIN), the legal basis for the implementation of which is defined in Article 24b of the Act of the Geodetic and Cartographic Law. At present, ZSIN has been partially implemented and is operated as an infrastructural mechanism of electronic interaction between public authorities responsible for maintaining cadastral and legal registers, aimed at ensuring access to registry data and their consistency. At the same time, this system does not function as a fully centralized single rights register and does not replace existing cadastral or legal registers. Thus, the Polish model of the institutional organization of registers combines a clear functional separation of the cadastral and legal segments with formalized mechanisms for integrating registry information and ensuring trust in its content.

In Ukraine, the cadastral block is institutionally represented by the State Land Cadastre, which, pursuant to the Law of Ukraine “On the State Land Cadastre” of 7 July 2011, is defined as a unified state geoinformation system containing data on lands within the state border of Ukraine, their designated purpose, restrictions on use, quantitative and qualitative characteristics, normative and expert monetary valuation, as well as the distribution of land among owners and users.<sup>5</sup> Thus, it is precisely the cadastre that performs the function of the spatial and identification basis of a land parcel as an object of civil circulation and a prerequisite for the subsequent state registration of rights.

Separately, national legislation directly links the possibility of civil circulation of a land parcel to its formation and the entry of relevant data into the State Land Cadastre. In particular, Article 79 of the Land Code of Ukraine provides that the formation of a land parcel involves the determination of its area and boundaries and the entry of information about it into the cadastre.<sup>6</sup> This establishes a direct dependence between the completeness and accuracy of cadastral data and the possibility of the lawful and economically efficient circulation of land parcels.

The legal block of the national model is concentrated in the system of state registration of real rights to immovable property, which operates on the basis of

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<sup>5</sup> No. 3613-VI, *Vidomosti Verkhovnoi Rady Ukrainy*, No. 8.

<sup>6</sup> Law of Ukraine of 25 October 2001—Land Code of Ukraine, No. 2768-III, *Vidomosti Verkhovnoi Rady Ukrainy*, No. 3–4.

the Law of Ukraine “On State Registration of Real Rights to Immovable Property and Their Encumbrances” of 1 July 2004 (Law on State Registration of Property Rights).<sup>7</sup> Within this block, ownership rights and other real rights (lease, servitude, emphyteusis, superficies), as well as their encumbrances, are recorded, forming the legally significant legal status of the real estate object. It is precisely the existence of a corresponding entry in the State Register of Real Rights that creates a presumption of the existence and validity of the right and constitutes a key prerequisite for the participation of the object in property circulation.

A separate institutional problem of the Ukrainian model remains the legacy of the Bureaus of Technical Inventory (BTI). Even after the effective introduction, as of 1 January 2013, of a unified system of state registration of real rights to immovable property on the basis of the Law on State Registration of Property Rights, and the transfer of state registration functions from BTI to the State Register of Real Rights to Immovable Property, a significant part of the technical and title documentation concerning objects whose rights arose earlier remained in BTI archives. This results in the persistence of institutional dependence on paper-based and decentralized sources of information, which increases the costs of verifying the legal status of immovable property and heightens the risks of legal uncertainty in property circulation.

In response to the above-mentioned institutional fragmentation, mechanisms of inter-register electronic interaction have been gradually developing in Ukraine. In particular, a governmental communication, as reported by EU4Digital (EU4Digital), indicates that interoperability of the State Land Cadastre with other information systems through the use of the “Trembita” system, which in practice makes it possible to accelerate access to the necessary data and reduce the need for information duplication.<sup>8</sup> Within the scope of this article, this is significant as an institutional factor of potential reduction of transaction costs: the fewer gaps exist between cadastral and registration data, the cheaper and faster it is to confirm the legal status of an object in transactions and disputes.

Thus, despite a similar two-tier structure of the real estate registration system, the Polish and Ukrainian models differ substantially in the level of institutional coherence and integration of registry data. These differences are not only legal in nature but also have a pronounced economic dimension, as they directly affect the

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<sup>7</sup> Law of Ukraine of 1 July 2004—On State Registration of Real Rights to Immovable Property and Their Encumbrances, No. 1952-IV, *Vidomosti Verkhovnoi Rady Ukrainy*, No. 51.

<sup>8</sup> EU4Digital. (2024). Trembita.gov.ua: Report for the 1st Quarter of 2024. Retrieved February 2, 2026, from: <https://eu4digitalua.eu/uk/news/trembita-gov-ua-zvit-za-2-j-kvartal-2024-roku/>

costs of rights verification, the level of legal risks, and the efficiency of property circulation. For this reason, further analysis of real estate registers through the lens of the economic theory of transaction costs is justified.

### **Real Estate Registers as an Instrument for Reducing Transaction Costs: a Comparative Economic Analysis**

Previously, the institutional organization of systems for registering data on land and real estate in Poland and Ukraine was examined. However, the significance of registers is not limited solely to their legal or administrative function. From the perspective of the economic analysis of law, real estate registers act as a key mechanism for reducing transaction costs that accompany the circulation of property rights.

The theoretical foundations of this approach are laid down in Coase's theory of transaction costs, in which he demonstrated that the use of the market is not cost-free and is always associated with expenses related to information search, the conclusion and enforcement of transactions, which explains the existence of institutions as mechanisms for their minimization (Coase, 1937). Subsequently, Williamson clarified that transaction costs are determined by the bounded rationality of participants and the risk of opportunistic behaviour, and therefore effective institutions should reduce information uncertainty and the need for additional safeguards (Williamson, 1985).

In the context of the circulation of property rights, these theoretical provisions are directly applicable to registration systems. According to Shavell, the key economic advantage of a registration system lies in the fact that it facilitates the sale and resale of property by reducing uncertainty regarding ownership rights: in the absence of a register, a buyer will either refrain from entering into a transaction or will be forced to incur additional resources to verify the legitimacy of the title, which directly increases transaction costs (Shavell, 2003, p. 10).

Contemporary land administration doctrine further develops this approach by viewing land registration not merely as a technical accounting process. As noted by Felicitas Sommer and Walter Timo de Vries, land registration is understood not only as a technical process of record-keeping, but as an institutional mechanism for collecting, storing, and legitimizing socio-legal relations concerning land (Sommer and de Vries, 2023). Accordingly, the institutional design of land registers and the logic of their organization directly affect the functioning of the land market and the economic outcomes of property circulation.

In the sphere of real estate circulation, in our view, transaction costs manifest themselves primarily in the costs of verifying the legal status of an object, identifying its characteristics, establishing the completeness and validity of rights, as well as in time costs associated with state registration and waiting for legal certainty. It is precisely in this dimension that real estate registers perform an economic function—they reduce information asymmetry between the parties to a transaction and lower the risks of legal uncertainty.

It should also be noted that the application of the economic analysis of law to the study of registration systems cannot be regarded as a universal or self-sufficient method for explaining legal phenomena. As Havryliuk notes: “(...) a drawback of the methodology of economic analysis with regard to legal processes is, first, its variability, which does not offer a single ‘correct’ or unconditionally effective solution to a legal problem, and second, its tendency to ignore social and ethical aspects that are traditionally taken into account by legal science” (Havryliuk, 2024, p. 141). This means that economic criteria of efficiency cannot automatically substitute for a legal assessment of institutions, since real estate registers perform not only an informational but also a regulatory function, shaping the legal expectations of participants in circulation and influencing their behaviour and the level of legal certainty.

According to the approach developed by Posner within the framework of the economic analysis of law, legal institutions perform an instrumental function in organizing social interaction, and their effectiveness is determined by their ability to reduce costs associated with exchange and legal uncertainty (Posner, 2014). In this sense, economic analysis does not deny the normative nature of law, but offers an additional analytical lens that makes it possible to assess the extent to which specific legal institutions—such as real estate registration systems—facilitate or, conversely, hinder the efficient functioning of the market.

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Within the framework of this article, the economic analysis of real estate registers is used as a tool to assess how the institutional design of registration systems in Poland and Ukraine affects the level of transaction costs, legal certainty, and

the speed of property circulation. It is precisely in this applied interdisciplinary dimension that the economic analysis of law reveals its heuristic value.

From an economic perspective, the use of real estate registers in property circulation has complex advantages that go beyond the purely legal recording of rights. As noted in an explanatory statement of the Ministry of Justice of Ukraine: “(...) official state registration of rights to immovable property ensures legal protection and legal certainty of ownership rights, creates the possibility of lawful alienation and other forms of civil circulation of the object, opens access to credit secured by real estate, constitutes a prerequisite for participation in state programs (in particular compensation and recovery programs), and forms official data necessary for statistical accounting and human rights protection activities.”<sup>9</sup>

In Ukraine, the introduction, as of 1 January 2013, of an electronic system of state registration of real rights to immovable property led to a normative reduction in registration time limits. Pursuant to the Law on State Registration of Property Rights, state registration of rights is carried out on the day of submission of the application, and the overall duration of the procedure does not exceed five working days from the moment the application is registered in the State Register of Rights. The financial dimension of transaction costs in Ukraine is also formalised. For standard state registration of ownership rights, an administrative fee in the amount of 0.1 of the subsistence minimum for able-bodied persons is charged. The legislation also provides for the possibility of expedited registration for an increased fee: one subsistence minimum for a period of two working days, two subsistence minimums for registration within one working day, and five subsistence minimums for registration within two hours. At the same time, the legislation establishes a wide range of social exemptions under which the administrative fee is not charged, in particular for persons whose rights arose before 1 January 2013, persons with disabilities, combatants, and citizens whose property was destroyed as a result of the armed aggression of the Russian Federation. Such a model allows participants in property circulation to choose an economically justified balance between the time and cost of registration, which directly affects the structure of their transaction costs.

In Poland, there is no normatively established mechanism for paid “acceleration” of entries in the land and mortgage register. At present, the rules do not define a specific period between the submission of an application and the entry being made, and its actual duration depends on the workload of the courts

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<sup>9</sup> Ministry of Justice of Ukraine. (n.d.). Chomu vazhlyvo vnesty vidomosti pro maino do reiestru rechovykh prav. Retrieved February 9, 2026, from: <https://www.kmu.gov.ua/news/chomu-vazhlyvo-vnesty-vidomosti-pro-maino-do-reiestru-rechovykh-prav>

and the number of applications, which may range from several weeks to several months or even longer.<sup>10</sup> Since 2023, the structure of fees for registration actions in land and mortgage registers has been unified: a fixed court fee of 200 PLN has been established for entering a primary record of ownership or perpetual usufruct, while other actions—such as mortgage registration, entries of limited real rights, or the deletion of previously made entries—are subject to differentiated fees that vary depending on the type of action and the nature of the legal transaction. Such a system of fixed and differentiated fees creates a predictable basis for assessing the direct costs incurred by participants in property circulation.

The transition from paper-based to electronic forms of register maintenance has an independent economic effect. For Ukraine, a “vulnerable point” remains the coexistence of electronic registers alongside paper-based and decentralized datasets (in particular, BTI archives concerning “historical” objects), which increases the costs of verifying legal status and creates risks of data incompleteness. At the same time, this shortcoming may be gradually mitigated provided that the level of interoperability between cadastral and legal registers is increased and organizational models of their interaction are improved. In the Ukrainian context, such an instrument is the national electronic interaction system “Trembita”, designed to integrate state information resources and registers (EU4Digital). In combination with further digitalization of cadastral and legal databases, this mechanism is potentially capable of significantly reducing transaction costs associated with verifying the legal status of real estate, accelerating property circulation, and lowering the risks of legal uncertainty in contractual and dispute-related legal relations.

In Poland, such an additional institutional element aimed at increasing the economic efficiency of the real estate registration model is the development of the Integrated Real Estate Information System (ZSIN). This system does not replace cadastral or legal registers, but ensures their informational interaction, reconciliation, and consistency of data, thereby reducing the risks of discrepancies between cadastral and legal information. In economic terms, this means a reduction in the costs of verifying the legal status of an object, a decreased need for additional evidentiary procedures, and increased predictability of property circulation. Thus, ZSIN complements electronic land and mortgage registers as an instrument of indirect reduction of transaction costs, without violating the principle of functional separation of registers characteristic of the Polish model.

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<sup>10</sup> Okeask. (n.d.). Land Registry (Księga wieczysta) in Poland. Retrieved February 10, 2026, from: <https://okeask.com/ru/category/poleznaya-informaciya/1702808532-zemelyniy-reestr-ksiega-wieczysta-v-polyshe>

Thus, it can be summarized that the economic benefits of using electronic registers for transaction participants manifest themselves primarily in the reduction of the time required to conclude contracts due to: prompt access to official data; the possibility of repeated verification of rights; reduced costs of legal due diligence through limiting the number of “manual” procedures and inter-institutional requests; lower costs of ensuring contract performance as a result of simplified confirmation of the legal status and encumbrances of an object; as well as a decreased likelihood of disputes due to the reduction of information asymmetry and risks of legal contestation. At the same time, the differences between the countries under study indicate that the key factor in reducing transaction costs is not merely the fact of electrification of registers, but the level of their institutional coherence and the effectiveness of inter-register interaction, which ultimately determines the economic potential of registration systems in the long term.

## Conclusions

Thus, summarising all of the above, it may be concluded that land and real estate registers perform not only an accounting and legal function, but also a distinct economic one: they reduce transaction costs by decreasing information asymmetry, simplifying the verification of an object’s legal status, and increasing the predictability of property circulation. A comparison of the Polish and Ukrainian models demonstrates that the decisive factor is not the mere fact of electrification, but the institutional coherence of cadastral and legal data and the effectiveness of inter-register interaction (in particular through ZSIN in Poland and the “Trembita” system in Ukraine), since it is precisely this coherence that determines the speed of transactions, the level of legal risks, and the cost structure borne by transaction participants.

Further reforms in the field of real estate registration should be aimed at institutional coordination of registers and digital data integration in order to achieve economic efficiency compatible with the requirements of legal certainty and stability of property circulation. In contemporary scholarly discourse, increasing attention is being paid to approaches involving the application of blockchain technologies in land registration systems (Zein and Twinomurinzi, 2023) as a potential instrument for enhancing security, immutability of registry records, and traceability of changes. Such solutions may further contribute to reducing transaction costs by limiting the risks of forgery, unauthorized interference, and disputes over property ownership. At the same time, a comprehensive assessment of the legal, institu-

tional, and economic consequences of implementing blockchain solutions in the field of real estate registration requires further scholarly development and remains open for future research.

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