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MEASURING PROPERTY REGISTRY IN BRAZIL: A PRIVACY BY DESIGN ECONOMETRIC MODEL

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Abstract

The Registering Property indicator of the Doing Business report is one of the 11 indicator sets published in order to evaluate business regulations in 190 countries. Tracking transactions at registry offices is key for evaluating this indicator. Currently, the availability of specific economic indicators for the Brazilian real estate sector is quite limited and heterogeneous, based on sparse and unrelated data sources. The digital development of the Brazilian property registry system, based on the Electronic Real Estate Registry System (SREI) model, requires the consolidation of statistical indicators on the operation of all registry offices in Brazil. SREI defines a distributed data architecture which promotes security and interoperability of registry data, offering a privacy by design approach for measuring property registry with the advent of the Brazilian General Data Protection Regulation (LGPD). This article presents an econometric model to evaluate property registry activity in Brazil in compliance with the data protection law.

Key Words: Property registry, Data protection, Real estate econometrics

1. Introduction

Economic indicators are regularly used by various agents to evaluate economic scenarios, make projections and guide decision making. Regarding real estate, the Registering Property indicator of the Doing Business report, which measures the quality and efficiency of land administration in the context of business regulations in 190 countries worldwide, requires the tracking of transactions on the immovable property registration system of each country in order to evaluate the local procedures required to process property transfer (Doing Business, 2020).

In Brazil, economic indicators for the real estate sector are sparse, few of which are built on nationwide source data. Brazilian property registry offices (which are responsible for carrying out all real estate registry operations) make up a distributed network of registry data with the potential to provide rich information about Brazilian real estate transactions in the form of property registry statistics and indicators.

In 2014, Brazil's National Justice Council (CNJ) released Recommendation 14 / 2014, which designated the Electronic Real Estate Registry System (SREI) model as a reference for implementation of the electronic real estate registration system in Brazil. The SREI model has specified a distributed data architecture that allows for the creation of a consolidated list of indicators while keeping the management of records under the responsibility of each registrar, who is held as legal guardian of such records. Although born-digital registry data sources are not yet available in Brazil, this architecture is still recommended, as it would enable an evolutionary property registry measuring model compatible with electronic real estate registry.

Considering the data made available through the Declaration of Property Transactions (DOI), a standard communication procedure between registry offices and the Brazilian Internal Revenue Service, a nationwide econometric model defining statistics and indicators for measuring property registry in Brazil was developed. This econometric model considers registry data as a source for economic indicators, which will allow them to be updated and extended when electronic real estate registry is fully available. The indicators were built upon generic constructs such as transfer operation types and property types, and statistics were defined based on the quantity of operations, monetary values of transactions, the sizes of properties, geographic locations, and timespans.

Besides meeting econometric requirements, this property registry measuring model must also meet legal requirements for data protection with the enactment of the Brazilian General Data Protection Law (Federal Law 13,709 / 2018). In order to evaluate the econometric model's compliance, a legal study was conducted to analyze whether or not registry offices are legally authorized to provide data for property registry statistics and indicators, which could mean using registry data for a different purpose than the one for which it was collected.

Evaluating personal data protection in the context of real estate registry requires reconciling citizens' privacy and data protection rights and the publicity principle upon which the registry system was built. Data protection regulation defines a set of requirements for data processing and public disclosure of personal data. The Public Registries Law (Federal Law 6,015 / 1973) defines the registry publicity principle according to which all registrars must provide information about registry data upon request, regardless of who the person requesting is or the justification for the request. Opening access to registry data, in addition to the individual access addressed by the Public Registries Law, while legally authorized, demands greater qualification of which data will be opened and how (hence the importance of anonymization techniques). This will avoid indiscriminate access for purposes that are incompatible with the social and economic purpose of the publicity principle of the registration system.

2. Electronic Real Estate Registry System of Brazil (SREI)

In compliance to Brazilian Federal Law 11,977 / 2009, which determined that the Brazilian registrars should institute an electronic registration system, the Electronic Real Estate Registry System (SREI) model was developed, establishing minimum requirements for such system's architecture. The SREI project was developed in 2011, within the scope of the Legal Amazon Registry Offices Modernization Project, created by the Brazil's National Justice Council, and has specified as "an electronic real estate registration system aiming for system security, data interoperability and document longevity" (Lago, 2019). The complete set of SREI model documentation is available on the SREI website (https://folivm.wordpress.com/documentos/).

The SREI architecture model defines a distributed system in which each registry office is a node of the network and operates its own Office System (SC). Each SC keeps its born-digital registry books and documents database, though all registry offices share the same data standard in order to enable interoperability of the registry network. SREI architecture also defines a Shared Electronic Services System (SAEC), which will serve as a single point of contact for requesting services in electronic form from any registry office in Brazil. It will also be responsible for building nationwide statistical indicators on the operation of the Brazilian property registration system.

Additionally, the SREI model adopts a digital content-structured document standard which defines the semantic representation of registry data. This means that the born-digital registry books contain structured data that are organized such that computer systems can read them and identify different property registry features, such as address, property, person, protocol and registration act.

Concerning property registry data, the SREI works as a Distributed Data Network (DDN). According to Popovic (2015), a DDN is a network in which no central repository of data exists. Rather, data are maintained by and reside behind the firewall of each data holder, which maintains control over its data and has standardized its data according to a common data model. DDN provides several key benefits, with security in place so that each site maintains ownership over its own data, addressing and alleviating data holders' concerns over data security, data privacy and proprietary interests.

The SREI architecture promotes security and interoperability of registry data, maintaining the main characteristic of the Brazilian registry system: public service delegated to private agents (the registrars), who are also currently responsible for providing information about the registry data. DDNs represent a new network architecture paradigm that enables data access and interoperability while mitigating most security and privacy risks associated with data transfer and maintenance of centralized data repositories (Maro et al., 2009).

More recently, the Brazil's National Justice Council released Provision 89 / 2019, which regulates the SREI and SAEC, establishing guidelines for the statute of the National SREI Operator (ONR). The SREI system shall be implemented and operated by the ONR, which includes the consolidation of statistical data on the operation of real estate registration services. This will allow for management of nationwide economic real estate indicators in order to provide valuable information for property registry stakeholders such as real estate market operators, financial institutions, government agencies and the Judiciary.

3. Econometric model for property registry measurements

The availability of economic indexes is of vital importance for behavior analysis in any given sector, as they reflect the intensity and diversity of economic activity. They allow for analysis of business cycles and capital concentration, support decision-making at the microeconomic level for private entrepreneurs or at the macroeconomic level for the establishment of public policy. Most real estate market indexes for the sector in Brazil were created within the last decade and are practically limited to price variation measurements based on different samples and classifications and are restricted to relatively few information sources, even when supported by large databases. Defining conceptually robust indexes and transparent access to data and information are important factors for economic development, as is reinforced by international organizations.

The econometric model for property registry measurement defined herein is composed of indexes and statistics. On one hand, indexes are defined to measure, from an economic perspective, property registration activities. They are generally presented in the form of official reports published periodically. On the other hand, statistical views are presented based on the information related to each of the operations (records).

Moreover, this econometric model considers registry information concepts independently from the information source. Considering that electronic real estate registry data are not yet available, the model is able to use the DOI (a Declaration on Real Estate Operations that is currently transmitted by the registrars to the Federal Revenue Service) as a source of registry information so that additional data collection is not necessary for producing the indicators. In this sense, the indexes and statistics defined by the model are compatible with the electronic registry data as specified by the SREI, which may be considered a registry information source in the near future.

All registrars in Brazil must issue DOI files, which include data referring to all registered transactions that characterize the acquisition or sale of properties carried out by individuals or legal entities, regardless of their value. It also contains data on the location of the property, property type, construction status and area, type and value of the real estate transaction and date when registration was filed. The DOI file must be transferred to the Brazilian Federal Revenue Service every month. Initially, registrars must provide the same file so that indexes and statistics can be produced. This econometric model allows data to be properly aggregated so that specific information about a single real estate transaction is not accessible.

The main constructs that compose the definition of indexes are transfer operation type and property type. Transfer operation type is related to the nature of the real estate transaction (sale, expropriation, mortgage or adverse possession). For each type of transfer operation, the areas and associated values are informed. The number of operations, the sum of these operations and the area added by those operations are considered to measure property registry activity. Property types represent the class of the real estate, such as house, apartment or land. Not all transfer operations and property types are currently informed in the DOI file. The econometric model considers that new types of real estate transactions may be created in the future and the current set of values may be expanded. Figure 1 presents a detailed econometric definition of the Real Estate Activity Index (IAI).

Figure 1: Econometric definition of the Real Estate Activity Index (IAI)

$$IAI_{a_0}^{a,t} = \sum_{g \in G} \left(W_{g,a_0}^{(1)} \ . \ IAI\ G_{a_0}^{a,t}(g) \right)$$

$$W_{g,a_0}^{(1)} = \frac{Valor\ total_{a_0,g}}{\sum_{g \in G} Valor\ total_{a_0,g}}$$

$$IAI\ G_{a_0}^{a,t}(g) = \frac{IAI\ GV_{a_0}^{a,t}(g) + IAI\ GQ_{a_0}^{a,t}(g)}{2}$$

$$IAI\ GV_{a_0}^{a,t}(g) = \sum_{c \in C} \left(W_{g,c,a_0}^{(2)} . IAI\ GVC_{a_0}^{a,t}(g,\ c) \right)$$

$$IAI\ GQ_{a_0}^{a,t}(g) = \sum_{c \in C} \left(W_{g,c,a_0}^{(2)} . IAI\ GQC_{a_0}^{a,t}(g,\ c) \right)$$

$$W_{g,c,a_0}^{(2)} = \frac{Valor\ total_{a_0,g,c}}{\sum_{c \in C} Valor\ total_{a_0,g,c}}$$

$$IAI\ GVC_{a_0}^{a,t}(g,c) = \frac{\overline{VALOR}_{g,c,a,t}}{\overline{VALOR}_{g,c,a_0}} . 100$$

$$IAI\ GQC_{a_0}^{a,t}(g,c) = \frac{QDE_{g,c,a,t}}{QDE_{g,c,a_0}} . 100$$

Source: prepared by the authors

The econometric model also defines interactive statistics for a cross-sectional view based on volumes at one state or registry office, a cross-sectional view based on the average in one state, a longitudinal view based on volumes and a longitudinal view based on averages.

The privacy by design approach to development of this econometric model involves the application of foundational principles to technologies, network architecture and governance of how property registry is measured. Privacy as default embedded into design, end-to-end security and respect for user privacy guided the design principles of this econometric model (Cavoukian, n.d.). Design of the model required that the purpose of using registry data be restricted to the statistical consolidation of indexes. All data must undergo a process where any personal information attached to a record must be discarded. In addition, an agreement and DOI file transfer model must be defined in order to apply anonymity rights upon data transmission and to guarantee non-centralization of registry data.

Finally, econometric and legal requirements for the property registry measurement model must be translated into software requirements so that an information system can collect registry data and calculate statistics and indicators. Not only anonymization techniques must be applied for all personal data included in real estate transactions (such as owner identification), but other security requirements must also be considered, such as use of digital certificates to identify registry officers that send DOI data and enabling SSL data transmission encryption between registry offices and SAEC. Compliance to the SREI architecture model also requires that no registry data is centralized, which means disposal of all data that is unnecessary for the consolidation of statistics and indicators. Interactive dashboards shall be offered to present statistics about property registry within selected geographic regions or timespans, but the information system must not allow access to data on individual transactions, preventing any de-anonymization processes.

4. The Brazilian General Data Protection Law (LGPD)

Development of new digital technologies has increased the possibilities for collecting, storing and processing data, and has made several features and services available to society that have never been seen before. The speed at which this scenario is changing requires flexibility so this new asset can be used for its greatest benefit, but also requires that guarantees and limitations be reformulated for its use, especially in how it relates to data protection and data ownership.

Assigning new uses to data held by registrars requires a compatibility analysis of the purpose for which the data were initially collected and the ulterior purpose of new processes. This analysis must ensure that new data usage is not only in line with the social purpose of registration publicity, and also within the legitimate expectations of the data subjects. This would ensure a greater level of transparency-publicity on the economic situation of the real estate sector, without compromising the privacy of data subjects.

Public Registries collect information within the limits of authenticity, security and effectiveness of legal acts (article 1 of Federal Law 6,015 / 1973 and article 1 of Federal Law 8,935 / 1994), which are objectives historically summarized in the guiding principle of publicity. Consequently, a compatibility test for new uses of the data trusted to the Registry Office necessarily involves the analysis of registration publicity and, in this case, whether or not it is compatible with the creation of economic indexes.

In Brazil, the first part of the Public Registries Law (Federal Law 6.015 / 1973) is dedicated to the regulation of land registry publicity (articles 1 to 28). Apart from being one of the principles surrounding public administration (article 37 caput of the Federal Constitution / 1988) and a general mandate in democratic societies, registry publicity is distinguished from other forms of publicity by the “organization and technical perfection” it ensures, revealing, thus, the complete legal status of its object (Almeida, 1966). In this sense, Oliveira (2010) states that public registries are “designed to promote information, to any interested party, concerning the legal status of real estate, the effect of which, at the very least, is the unassailable presumption of knowledge."

This general concept allowed for the analysis of registration publicity in its two expressions within the legal doctrine. On the one hand, there is formal publicity, designed to inform about a certain legal situation, even creating the “obligation to make interested parties aware of the content of the registries” (Almeida, 1966). On the other hand, there is “material publicity”, referring to its substantive characteristics that allow the extinguishment, modification and creation of rights, guaranteeing its effectiveness against third parties based on the “fiction of knowledge” (Pontes de Miranda, 1955). The economic function of real estate registration publicity comes from its legal purpose of providing security and certainty of the law. Brandelli (2011) argues for the social function of this system by providing the right to property, the circulation of goods, the generation of wealth and peaceful social coexistence (guided by legal certainty).

According to Ceneviva (2009), registration publicity thus fulfills a threefold function: a) first, it informs society, interested or not, about the content of the registration; b) secondly, it partially sacrifices people's privacy in order to achieve the benefits arising from registration; c) and, finally, it serves as an instrument for public policies of national interest as well as for statistical purposes. Such a threefold function of registration publicity therefore synthesizes the reason why a vast amount of information is entrusted to registrars. At the same time, it establishes the limits and possibilities of new uses for such databases. This is the central issue in analyzing the compliance of the project of creating economic indexes.

The econometric model for property registry measurement, which is based on the information provided by DOIs and must be based on the respective property registration, converges with the publicity and security aspects of the legal situation of the real estate sector. In other words, these indexes will provide even more accurate information to the various stakeholders (material publicity), and their subsequent dissemination on an interactive platform will facilitate its access by society as a whole (formal publicity). In the end, this new use attributed to data is even capable of meeting possible social demands for the purposes of public policy related to the real estate sector.

This new use of information held by registrars would be compatible with the threefold function of the registration publicity system. This is because the objective of the project is, ultimately, to better inform society about the economic situation of the real estate sector in the country (as it will serve as an instrument for public policy and for statistical purposes). On the other hand, with the adoption of good practices (such as anonymization), restriction to privacy and intimacy would only be partial: the restriction of privacy and intimacy would take place at the exact limit of what is necessary for the disclosure of the registration situation. In this way, it will be possible to make society aware of not only the legal situation of each property, but also the economic situation of the real estate sector as a whole (publicity function).

It is worth pointing out that, considering the asymmetrical relationship in which citizens are legally obliged to grant their data to the Registry, this notion of compatibility is even more pertinent (Kostadinova, 2018). While giving flexibility to possible new uses for such information, it still considers the legitimate expectations of the data subjects, ensuring the contextual integrity of the flow of information for the real function of the real estate registration system (Nissenbaum, 2009).

DOIs are generated from the data provided to the registrars by the data subjects. Despite having a different purpose from registry itself, DOIs are generated and property registration information is disclosed. Real estate companies aim to create economic indicators to make real estate information public, providing information about the real estate sector as a whole. In this sense, there would be compatibility with the general purpose of processing such data, with positive impacts on the economy and on the implementation of public policy.

On the other hand, the way in which such data would be disclosed—allowing no access to the owners' personal data or to individualized property data—is compliant with the limitations that legislation imposes on the principle of publicity in order to protect data subjects' privacy and intimacy. This is what we call qualified publicity, which corresponds to a series of duties imposed on registrars—who are fiduciaries of the information—so that there cannot be any sharing or indiscriminate access to the data entrusted to them. This lays the way for the establishment of good practices (such as anonymization) in the use of information so there will be no breach of the subjects' data and party trust.

The Brazilian General Data Protection Law (Federal Law 13,709 / 2018) is designed to regulate personal data protection processing. Rather than treating the matter sparsely under multiple regulations, it was designed to address those matters holistically. As this law will come into effect in 2020, the project of creating economic indexes on real estate operations will need to fulfill the conditions for legitimation foreseen in the LGPD. By attributing a new use to DOI data, the project must comply with one of the hypotheses in article 7, which provide a list of legal bases for processing personal data. Considering the econometric model for property registry measurement, we believe that the legitimate interest basis is the most appropriate one to support the project. The LGPD specifies that personal data may be processed on the basis of a "legitimate interest of a third party", provided this "purpose is legitimate, considered from concrete situations," and does not frustrate the "legitimate expectations" of data subjects and their fundamental rights and freedoms.

In view of the misunderstanding of the terms "legitimate purpose" and "legitimate expectation" (Bioni, 2019), their respective meanings have been vectored by the principle of purpose whose definition is also based on the adjective "legitimate". According to article 6, item I of the LGPD, processing will be carried out "for legitimate, specific, explicit purposes that are informed to the data subject, with no possibility of further treatment in an incompatible way". The wording reinforces the notion of compatibility, establishing two other analytic components: "concrete situation" and "fundamental rights and freedoms".

The creation of economic real estate indexes is a concrete situation. Moreover, they have the potential to subsidize public policy, so that it can have a positive impact and, therefore, reinforce the fundamental rights and freedoms of data subjects. At last, it should be noted that LGPD also reinforced the notion of compatibility with respect to publicly accessible data. It is seen that such data may be processed for "new purposes" provided that "legitimate purposes are observed "(Article 7, §7), as well as taking into account "the good faith and the public interest"(Article 7, §3) that justified its availability. This creates additional requirements that are part of a circular and highly abstract vocabulary.

The compatibility test, previously structured on the triple function of the registration system, is what legitimizes the new use of DOI data to create economic indexes in the real estate sector. To the extent that a new set of information will be provided about the situation of the real estate sector in Brazil in an interactive platform, the access to these data by the population and with possible uses in favor of the collective interest (public interest) will be enhanced. This is a further process that is expected by the information holders themselves, since they have entrusted (in good faith) their data to the registration system with the expectation of giving visibility – formal and material publicity – to real estate.

The notion of compatibility can only be made tangible if articulated with the very social and economic purpose of the registration system. The ambiguous vocabulary that surrounds such a test in the LGPD – legitimate expectation and purpose, good faith and public interest – then becomes reconcilable with the guarantees and limitations stablished to the flow of and access to Public Records data and the regime stated by the Brazilian General Data Protection Law.

5. Conclusion

The methodology described in this article has enabled the development of a privacy by design econometric model for measuring property registry, considering the Brazilian legal requirements and recommendations for electronic real estate registry. The proposed econometric model may be adopted straight away based on registry data available through the Declaration on Property Transactions (DOI), and may gradually update its information source as born-digital registry data are available along the development of Electronic Real Estate Registry System (SREI) system by Nacional Operator of SREI (ONR), according to Provision 89 / 2019 of the Brazil's National Justice Council. This evolutionary quality benefits the model as it allows for nationwide property registry measurement that is consistent with electronic real estate registry.

The production of indexes that represent real estate transactions registered in Brazil can contribute to indications of macroeconomic activity and financial stability, as a tool to estimate the values of the components of real estate wealth, as an input for consumer price indexes and for use in intersectoral and international comparisons.

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