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Citation for final published version:

Shahab, Sina and Viallon, François-Xavier 2021. Swiss land improvement syndicates: 'Impure' Coasian solutions? *Planning Theory* 20 (1) , pp. 44-62.
10.1177/1473095220923629

Publishers page: <http://dx.doi.org/10.1177/1473095220923629>

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Swiss Land Improvement Syndicates: 'Impure' Coasian Solutions?

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Abstract

An increasing number of planners have explored the implication of Coase Theorem for planning theory and practice. As there are often a large and dispersed number of actors involved in planning issues, the application of 'Pure' Coasian solutions has proved to be limited. However, some studies argue that when the conditions for a 'Pure' Coasian solution do not exist, 'Impure' Coasian solutions may still be achievable. This paper examines how, when conditions of 'Impure' Coasian solutions are available, local authorities in Switzerland use Land Improvement Syndicates (LIS) as a policy instrument in order to achieve negotiated solutions in relation to development processes involving multiple landowners. With a syndicate in the commune of Cheseaux as an illustrative example, the paper analyses how this policy instrument has been utilised to reduce transaction costs, correct information asymmetries, and clarify property rights. The focus has been on an interpretation of the Coasian Theorem that identifies attempts to reduce transaction costs and clarify property rights as the main roles of governments or local authorities.

Keywords: Land Improvement Syndicates (LIS), Planning Policy Instruments, Land Readjustment, Coase Theorem, Transaction Costs, Property Rights.

1. Introduction

While markets are usually good platforms for the organisation of economic activities, they do not necessarily lead to optimal outcomes, and often fail to efficiently allocate resources (Mankiw, 2011). There are different types of market failures, including: *inter alia*, externalities, information asymmetries, non-competitive markets, transaction costs, inadequate assignments of property rights, and public goods. Arising from the need to correct market failures, government interventions in the form of introducing policies have been justified by Pigovian welfare economics (Lai, 1997). Arthur Pigou (1920) suggested the levying of additional taxes on a good/activity that is generating negative externalities in order to correct a market failure. Pigou's contribution was to introduce 'a surrogate price' in a perfectly competitive economy, through a per-unit charge, equal to the marginal external cost at the optimal level of pollution (Sandmo, 2008). Ronald Coase (1937, 1960), winner of the Nobel Memorial Prize in Economic Sciences in 1991, presented an alternative to Pigou's pricing policy, emphasising the role of property rights in internalising externalities, known as 'Coase Theorem'. According to the Coase Theorem, people can reach

efficient solutions concerning the issues caused by externalities if, with well-established property rights and zero transaction costs, they can negotiate the exchange of rights to perform activities that cause externalities and are affected by externalities, regardless of the initial allocation of resources.

The Coase Theorem implies that from an efficiency perspective, government interventions are not always desirable (Cooter, 1998), so long as the conditions of a 'Pure' Coasian solution are met, i.e. the transaction costs of exchange are nil and property rights are well-defined and freely tradeable. Nevertheless, 'Pure' Coasian solutions are rare (Lai, 1994, Sorensen, 1994), if existent in actuality, given that real world property rights are often not adequately assigned or transferable, information is inadequate or asymmetric, and transaction costs are high. These impeding conditions apply particularly to situations involving several actors. In line with the second-best theory (Lipsey and Lancaster, 1956, Blackorby, 1990, Jones and Cullis, 1993), Clinch et al. (2008) argue that when the conditions of a 'Pure' Coasian solution do not exist, 'Impure' Coasian solutions may still be achievable. In other words, whilst the first-best solution (i.e. a 'Pure' Coasian solution) is often not viable, a second- or third-best solution, (i.e. an 'Impure' Coasian solution) may be a more practical approach. An 'Impure' Coasian solution is realisable through the intervention of a third party (e.g. local authorities or intermediaries) in situations where: 1) property rights are not clearly initially assigned but can be clarified; 2) property rights can be traded; 3) transaction costs are high but can be reduced; and 4) a reduction in information asymmetry between parties is possible. In this interpretation, the key role of government intervention is to designate and enforce well-defined and tradable property rights, and to minimise transaction costs.

An increasing number of planners and economists have identified the relevance of the Coase Theorem in the resolution of planning and development issues (Lai and Hung, 2008, Lai and Lorne, 2006, Lai and Lorne, 2013, Lai et al., 2015, Lai, 2014, Webster and Wu, 2001, Webster, 1998, Webster and Lai, 2003b, Fischel, 2015, Slaev, 2016, Gurran et al., 2018). Using the Coase Theorem, some researchers have challenged the appropriateness of zoning as a primary policy instrument within the dominant traditional regulatory approach in land use planning (Pearce, 1981, Lai, 1997, Webster, 1998, Clinch et al., 2008). These researchers consider the property rights approach resulting from the Coasian Theorem as an alternative to zoning in order to regulate externalities arising from land-use markets. Coase (1960) also uses zoning as an example where regulations have made matters worse. Holcombe (2013) puts forward contractual agreements as a means of maximising potential gains among parties directly affected by externalities. Slaev and Collier (2018) highlight the relevance of Coasian approaches for the establishment of individual responsibilities, and thus the efficient and sustainable management of natural resources.

'Pure' Coasian solutions might only be available for minor planning issues, for example in addressing the conflict of interests between two neighbours in the use or development of their properties. In most planning and development issues, the 'Invariance' version of Coase Theorem (Lai, 1997) is not achievable. Since there are a large and dispersed number of actors involved and/or affected, clarifying development rights is subject to negotiations, information is asymmetric, and the potential for rent-seeking behaviours and opportunism is present. Nevertheless, using two examples in Ireland, Clinch et al. (2008) argue that an 'Impure' Coasian solution can be realised even in major planning issues (i.e. where there are large numbers of people affected by planning decisions), if people can be represented by either local planning authorities and public representatives (i.e. a form of government intervention) or representative community groups. Given the unlikelihood of achieving an agreement with all parties in large communities, the involvement of individuals or groups who can represent such communities is essential. While the direct application of Coasian solutions to planning theory and practice has been limited, it seems that some planning authorities have used 'Impure' Coasian solutions, perhaps unknowingly, in different jurisdictions.

This paper aims to examine the conditions that provide for the use of 'Impure' Coasian solutions through analysis of a Swiss policy instrument, Land Improvement Syndicates (LIS), which is used to facilitate land development processes involving multiple landowners. Within Land Improvement Syndicates, local authorities facilitate the establishment of an assembly of landowners who make decisions related to the development of their properties, as well as other development-related issues within a defined area. This paper explains how Swiss planners utilise the LIS to facilitate agreements amongst landowners by bringing landowners together, setting-out ground rules on collective decision-making processes, providing reliable information for involved actors in an equal manner, economising on planning and development costs, and in the clarifying and re-allocating of development rights. Through the lens of the Coasian Theorem, we argue that the main role of local authorities in the LIS process is to minimise transaction costs and facilitate the re-allocation of property rights. Conceptually, this paper is in line with previous studies on the Coase Theorem in planning literature, more specifically the works of Clinch et al. (2008) on 'Pure' and 'Impure' Coasian solutions in planning and Lai (1997) on property rights justifications for planning. The paper is structured as follows: First, it discusses the Coase Theorem and its two main theories of transaction costs and property rights. This is followed by LIS background and mechanisms. Finally, using an illustrative example, the paper analyses how Swiss communal authorities use LIS to achieve 'Impure' Coasian solutions in a land development process involving multiple landowners.

2. Coase Theorem: Transaction Costs and Property Rights

Through a series of examples in his seminal work *The Problem of Social Cost*, Coase (1960) proposed that if property rights are well-defined and transaction costs remain low, agents can exchange rights in order to improve their mutual welfare, regardless of who owns the property rights. This work was a further development of his previous path-breaking article, *The Nature of the Firm*, in which Coase (1937) introduced the concept of transaction costs and explained how organisations reduce the costs of using the pricing mechanism. Arguing that incompletely defined property rights and subsequent transaction costs are significant to externalities, Coase (1960) contended that government intervention cannot be justified due to the presence of externalities *per se*. Rather, the need for government intervention arises from the existence of high transaction costs that undermine attempts to rearrange and reallocate property rights (or what Coase refers to as the legal rights or entitlements in property) and hinder internalising externalities. In a world of positive transaction costs, the initial allocation of rights and the associated entitlement-prescribing behaviour between actors related to these rights affect the allocation of resources: this is the corollary to the Coase Theorem. The allocation of entitlements through market interventions is of significance as defining, exchanging, and enforcing property rights are acts that are accompanied by costs. In this section, the two concepts of transaction costs and property rights, key to understanding the Coase Theorem, are further discussed.

Transaction costs are the non-production costs of an exchange (Webster and Lai, 2003a, Shahab et al., 2018a, Hou et al., 2019). They arise because of information uncertainty and as a result of the actions that transactors must take to manage for this uncertainty (Williamson, 1998, Shahab and Allam, 2019). There are different interpretations in regards to the concept of transaction costs (McCann et al., 2005, Shahab et al., 2019). Ranging from being considered as 'the cost of exchanging ownership titles' (Demsetz, 1969) to definitions such as Coase's (1960), costs are always present when carrying out market transactions. Klaes (2008) distinguishes three categories in defining transaction costs: monetary, relational, and institutional. The first, a narrow interpretation from the perspective of neoclassical

tradition in monetary conception, considers transaction costs as direct monetary costs arising due to the use of intermediary services when an agent engages in a market transaction. The second is a relational interpretation, based on the market micro-structural models concerning the interactions between involved parties. This interpretation concerns the way in which agents interact with one another beyond price signals, and the supply and demand dimensions of microeconomics. Finally, an institutional interpretation considers transaction costs to be an important component of institutional economics and analysis. This interpretation broadens the scope of transaction costs to include costs incurred in defining, establishing, maintaining, and transferring property rights (Allen, 1991, McCann et al., 2005). Defining and maintaining land property rights, for instance, requires various transaction-cost-generating activities such as conducting surveys, preparing titles, and establishing the necessary legal and bureaucratic infrastructure. This paper employs the institutional interpretation of transaction costs.

Property can be defined as “a claim to a benefit (or income) stream”, and property rights as “a claim to a benefit stream that some higher body -usually the state- will agree to protect through the assignment of duty to others who may covet, or somehow interfere with, the benefit stream” (Bromley, 1992, 4). Based on this definition, well-defined property rights require the possibility of exclusion of non-holders, the existence of clear rights assigned to right holders, and the protection of rights by higher authorities. Excludability allows the owner to exclude others from using the rights of a resource. Achieving a comprehensive assignment of property rights entails clearly defined ownership of all resources, and shared knowledge of the respective entitlements (Hanley et al., 2013). Such assignment also involves attributing clear liabilities over externalities and providing accurate information about their incidence and value (Webster and Lai, 2003b). Clear liabilities over externalities provides agents incentive to deploy resources in an efficient manner, and thus maximise welfare (Webster, 2005). Unclear liabilities or insufficient information, on the other hand, results in unexploited gains and rent dissipation. Welfare maximisation also requires property rights to be transferable (Hanley et al., 2013). Transferability provides the possibility of selling property rights to others (Whitten and Bennett, 2005). According to De Soto (2000), the transferability and fungibility of property rights occurs through their formalisation and integration into legally recognised registration systems. Such a registration system accounts for existing rights and contributes to their enforcement by securing titles from seizure or encroachment by others. By establishing and recognising the registration system and by defining property rights in the law, public authorities legitimise the content of rights and provide ‘legal mechanisms of adjudication and enforcement’ (Hodgson, 2015, 684). The contractual uncertainties which are an inherent characteristic of contractual assignments of property rights can be overcome through these legal mechanisms (Deakin et al., 2017, Webster, 2005).

3. Swiss Land Improvement Syndicates (LIS): Background and Mechanisms

Initial introduction of LIS by cantonal authorities arose from the need to adapt agricultural land plots for modern machinery in Switzerland (Courdesse, 2014). Based on the 1951 Federal Law on Agriculture and article 704 of the Civil Code, federal authorities supported agricultural land readjustment and collective infrastructure provision (e.g. roads and drainages) through the creation of public law corporations. The Canton of Vaud implemented these changes in the 1961 Land Betterment Act (LBA). In 1987, the canton modified article 4 of the LBA, and article 55 of the Cantonal Planning Act (CPA), in order to extend LIS to urban areas. In this way, the instrument incorporated planning aspects and could address various land management and development issues. In particular, these policy instruments have been used in the Canton of Vaud in cases where multiple landowners were involved and where there was a need to

reach an agreement regarding the allocation of development rights and/or future land use (Weber et al., 2011). Further, LIS have been applied where property subdivisions were deemed inappropriate or fragmented. As primarily land readjustment tools, LIS are comparable with land readjustment policy instruments in other countries: in the Netherlands (van der Krabben and Lenferink, 2018, Muñoz Gielen, 2016, van der Krabben and Needham, 2008), Germany (Home, 2007), Spain (Gozalvo Zamorano and Muñoz Gielen, 2017), Portugal (Condessa et al., 2015, Almeida et al., 2018), Turkey (Uzun, 2009), Israel (Alterman, 2007), Egypt (Soliman, 2017), India (Byahut, 2014), and China (Li and Li, 2007). The role of planners and local authorities in relation to these policy instruments varies depending on the planning and legal systems in different jurisdictions. For example, in Germany, planners take a rather passive role in development processes, whilst planners in the Netherlands hold a very active role as they are directly involved in buying and developing the land in the Dutch market-oriented planning (Hartmann and Spit, 2015).

With the use of LIS, local authorities in the Canton of Vaud aim to incorporate land readjustments, zoning changes, and infrastructure provisions within a single instrument (Prélaz-Droux, 2009). Land Improvement Syndicates bring landowners together through the establishment of a landowner assembly which can make decisions on new property subdivisions of a defined area, future land uses, the allocation of development rights, and the distribution of costs (i.e. the costs of infrastructure provision, planning and design, relevant surveys, etc.) and profits such as added land value (Tillemans et al., 2011). Syndicates which have been implemented in the Canton of Vaud have been mostly located in urban fringes (typically agricultural areas near cities/towns) and include areas ranging from 10 to 400 hectares. The number of landowners who were involved in these syndicates has ranged from 12 to 170 people. Outside of the landowner assembly, a syndicate consists of three committees (Schneider et al., 2003): a steering committee, a management committee, and an experts committee. Each committee has certain roles and its members are selected by the landowner assembly. The steering committee executes the decisions of the assembly, such as negotiating and contracting with lenders and developers, and making payments. The management committee audits the financial accounts of the syndicate. The experts committee conducts relevant surveys and valuations and prepares new property subdivisions, which take into account the input of landowners and local authorities.

The introduction of LIS as a policy choice can be triggered by either a bottom-up or top-down approach (art. 85d LBA and art. 50 CPA). This means that either landowners bring forward their development intentions to communal authorities, or cantonal and/or communal authorities identify current or potential issues concerning land, development, or public infrastructure. The syndicates executed in the Canton of Vaud have, for the most part, been initiated when the majority of landowners in the area voluntarily decided upon the creation of a Land Improvement Syndicate. When an overriding public interest exists, local authorities may also impose LIS as a policy solution (art. 27 LBA). Conducting a feasibility study is the first step in determining the suitability of a Land Improvement Syndicate to address identified issues. To do so, interested landowners or local authorities hire planners and surveyors in order to gain insight into the preferences of public and private sectors involved, prepare a preliminary plan, and make a provisional estimate of the costs and gains. When all landowners are willing to proceed with development and have agreed on the proposed changes, they may sign voluntary contractual agreements. However, when the desired changes are complex or contentious, a majority of landowners can form an assembly and vote on the creation of a Land Improvement Syndicate. This is followed by the election of representatives for the three syndicate committees (i.e. steering committee, management committee, and experts committee) and voting on the timing and details of activities and finances. At this stage, a development plan and new property boundaries need to be prepared (the former is normally carried out

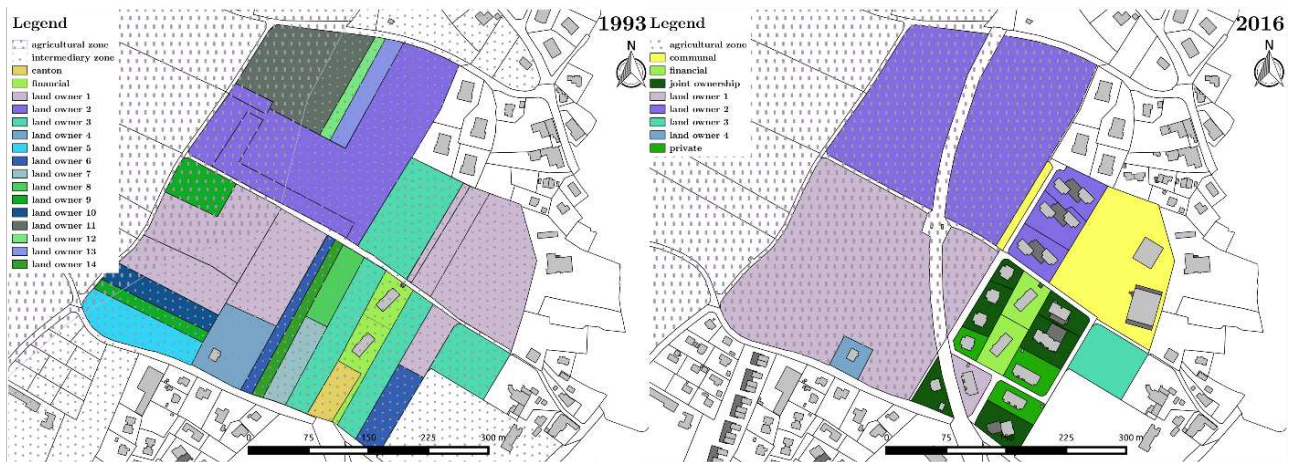
by local authorities, while hired surveyors and planners prepare the latter). Local authorities call for public hearings and meetings regarding the development plan and the new property boundaries. In the absence of opposition, the landowner assembly approves the new property subdivisions, and local authorities vote on the development plan. The steering committee then takes out loans in order to finance land servicing, and contracts developers to deliver the service. The final step before dissolving the LIS is to proportionately divide planning and land development related costs among landowners.

4. Derrière-le-Château Syndicate: An Illustrative Example

Using the *Syndicat Derrière-le-Château* (*Behind-the-Castle Syndicate*) as an illustrative example of Land Improvement Syndicates in Switzerland, this section outlines how land policy objectives were achieved through the agreement of ‘Impure’ Coasian solutions. The *Syndicat Derrière-le-Château*, referred to as ‘the Syndicate’ in this paper, was initiated in the commune of Cheseaux, Canton of Vaud, in 2002. Cheseaux is a suburban commune in the district of Lausanne that had populations of 2,900 and 4,342 inhabitants in 2002 and 2018 respectively. After a decade of population stagnation in the 1990s, the population of Cheseaux grew by about 50% while the population growth in the district of Lausanne over the last two decades was 15% (Viallon, 2017). The Syndicate area consisted of 18.2 hectares and included 30 plots of land owned by 16 landowners. Approximately 14 hectares of the area were zoned as an intermediary zone¹, while the rest of the area was zoned as farmland. As of 2001, a square metre of land located in an intermediary zone in the Syndicate area was valued at 20 Swiss Francs, while the same amount of space located in land zoned for farming was valued at 4 Swiss Francs. In 2014 at the dissolution of the Syndicate, seven landowners owned 17 plots of land of which 11.5 hectares were zoned as agricultural and 6.7 hectares were allocated for development (Figure 1). A square metre of land located in the development zone of the Syndicate area was valued at 250 Swiss Francs in 2003, and 800 Swiss Francs in 2014. The details of the formation and execution processes of the *Syndicat Derrière-le-Château* are presented by Shahab and Viallon (2019). The following sections show how the Cheseaux communal authorities used LIS to reduce transaction costs, rectify information asymmetries, and define and transfer property rights in a situation where the conditions of ‘Impure’ Coasian solutions were available: 1) transaction costs were high but could be reduced; 2) information between parties was inadequate and asymmetric—a condition which could have been reduced; 3) property rights were not initially clearly assigned, but could have been clarified; and 4) property rights could be traded.

1. In the planning system in the Canton of Vaud, if land is zoned for ‘intermediary’ or ‘long-term development’, it often means that its status quo land use is agricultural with a non-binding political promise to rezone it as a ‘development zone’ in the future (over a period of 15 years).

Figure 1. The area of Derrière-le-Château Syndicate before and after the policy intervention



Data sources: (Canton Vaud, 2015, Stutz, 1978, Besson and Courdesse, 1999, Marti and Courdesse, 2003)

4.1. Reducing transaction costs

Prior to the execution of the Syndicate, the area faced land use and development issues. The main issues were twofold: inappropriate property subdivisions for future development had created the need for land readjustments, and issues related to the building of a public school required land acquisition and zoning changes. Several voluntary contractual agreements were required to address the first issue as it was necessary for each landowner to negotiate with all neighbouring property owners. Achieving voluntary contractual agreements was considered impractical and involved lengthy negotiations which led in turn to high transaction costs. Concerning the second issue, local authorities needed to change the existing zoning plan for the plot of land designated for the development of the school. Given that the partial zoning change (i.e. rezoning the area solely to favour building the school) was unpopular among the landowners, the local authorities decided to modify the strategic plan of the area in a more comprehensive manner, rather than implementing a minor zoning change. The unpopularity of a partial zoning change was mainly due to the willingness of the landowners whose properties were located in the intermediary zone to modify the strategic plan in favour of the development of their properties. A partial zoning change would have created resistance to the project, generating high transaction costs. As a result, the Cheseaux communal authorities introduced a Land Improvement Syndicate as a policy choice, providing an alternative to rather unpopular and potentially costly options (such as voluntary contractual agreements and partial zoning changes). In this way, the introduction of LIS in Cheseaux *per se* can be seen as a policy intervention for the reduction of transaction costs.

The Syndicate decreased transaction costs in three main ways: by bringing landowners together, economising on the costs and resources invested in the process, and setting out ground rules for the collective decision-making process. The Syndicate brought involved landowners together and provided them with an opportunity to collectively express their preferences. During the process of establishing constituting the assembly, some landowners opted out of the Syndicate and sold their properties to other interested landowners. A central reason for opting out was that these landowners owned small properties and were not willing to pay for the land development and planning expenses. In-line with the literature on policy-related transaction costs (Shahab et al., 2018c, McCann, 2013, Mettepenningen et al., 2011, Shahab et al., 2018b), transaction costs were reduced by the low number of transactors involved, along with the high level of homogeneity and common preferences among the actors. In addition, the Syndicate

allowed the property owners to economise on the costs involved in the process, including both time-related costs and direct monetary expenses. For example, regarding time-related costs, the landowner assembly had the right to borrow funds from lenders for land servicing, resulting in a reduction of the time and effort each landowner needed to dedicate to securing the required funds. Similarly, for direct monetary expenses such as planning costs, land readjustment, land servicing, and infrastructure provision, the Syndicate decreased each landowner's share, proportionally dividing costs between involved landowners. In order to lower transaction costs for the private-sector, the communal authorities incurred the costs of planning and a portion of infrastructure provision costs.

The Syndicate facilitated negotiations between the landowners through the creation of several rules. One of the key rules was the 'majority rule'; the landowner assembly made decisions based on a majority-voting rule, as defined in cantonal legislation (art. 25 LBA). As Buchanan and Tullock (1962) discussed in their seminal work, the majority rule is associated with lower decision-making costs, in contrast with the unanimity rule which is not only more costly, but is often unworkable in practice. Another rule used in the Syndicate was the *one-person, one-vote rule*, in which each landowner was entitled to one vote regardless of the size or value of their properties. Similar to the majority rule, this rule lowered transaction costs by making the process easier to understand and simpler to administer, balancing the bargaining power among the landowners, and reducing the risks of opportunism and rent-seeking behaviours. The 'equal treatment of the actors involved' was another rule adopted by the Syndicate. For instance, the same unitary value was given to all existing land plots within the Syndicate area when computing the costs and benefits of the development and of related activities. This approach lowered transaction costs by simplifying costs and benefits calculations, building trust between actors, and limiting the risks of opportunistic behaviours.

4.2. Correcting information asymmetries

One of the key ways to reduce the transaction costs of land development processes is to provide adequate and accurate information in an equal and timely manner to all actors involved. The Syndicate mainly provided such information by: 1) preparing a feasibility study, 2) calling for public hearings, and 3) establishing committees. Completion of a feasibility study prior to the establishment of the Syndicate was a legal requirement which helped correct information asymmetries among involved actors. Local authorities hired private planning consultants and surveyors to carry out the study comprised of a draft of land use plan, a draft of new property boundaries, and a preliminary estimate of the potential costs and benefits associated with implementing the Syndicate. To do so, the experts met individually with all involved landowners to ask for their input and to determine their views on the development, and in particular, the establishment of the Syndicate. Conducting the feasibility study had several advantages; 1) it gave all interested parties a chance to express their opinions, needs, and expectations; 2) it established a better understanding of landowner preferences; 3) it promoted the shared knowledge and information among the involved parties; 4) it ensured sufficient information for all landowners in regards to the LIS procedures and the potential outcomes; and 5) it reduced the risks of future appeals. The private planning consultants and surveyors responsible for preparing the study had previously worked for the local authorities and for some of the landowners. This previous experience promoted trust and confidence in the information they provided. In addition to the feasibility study, the local authorities called for public hearings at various stages of the policy formation and execution process. These public hearings increased the transparency of the process, providing people living in the broader area with opportunities to voice their concerns and to remain informed.

The establishment of expert, steering, and management committees was another means of providing accurate and adequate information to the actors involved. The experts committee consisted of private planning consultants, surveyors, farmers, and notaries. A president and a secretary were members of the steering committee, while the management committee was comprised of accountants. These committees (particularly the experts committee) helped mediate the imperfect information and the uncertainty present in the process. In effect, they played important intermediary roles in the initiation and execution of the Syndicate. While intermediaries often emerge independently from planning policy instruments, the Syndicate created this intermediary role as an integral part of the policy design. There are various roles that intermediaries might play in policy instruments (Coggan et al., 2013, Benassi and Di Minin, 2009, Bendor, 2009, Gangadharan, 2000), from which it seems that the established committees held three main roles, including information/knowledge provider, broker, and clearinghouse. As information providers, the experts committee contributed specialist knowledge on land surveys, land readjustments, and property valuations. It also provided the landowner assembly with the relevant information concerning the sequence of activities of the LIS implementation process (e.g. conducting the feasibility study, calling for public hearings, design and planning), the rules and procedures of the LIS (e.g. voting rules and decision making processes), and the expected outcomes. Further, these committees played the role of brokers as they operated beyond the bounds of information providers. For instance, the steering committee conducted activities such as searching for developers and lenders and negotiating the contracts. The experts committee also acted as a broker, negotiating the development plan with the local authorities and aligning the preferences of landowners with land policy goals. Finally, to fulfil the clearinghouse role, the established committees ensured that the transactions took place as planned and that the involved actors fulfilled their obligations. For example, the management committee oversaw the calculation and schedule of the payments of relevant costs by the landowners and local authorities. The experts committee also prepared the titles for the newly shaped plots of land and recorded them in the land registry.

4.3. Re-assigning and transferring property rights

Local authorities took different actions within the Syndicate, attempting to reassign property rights and facilitate their transfer. Preparing a development plan, adjusting new property boundaries, and conducting land surveys and valuations were among the main actions taken. A condition for the successful re-assignment and transfer of property rights was the simultaneous coordination of these actions. Preparing a development plan and adjusting new property boundaries within the Syndicate required coordination between the local authorities and property owners. It also required concomitant execution of conformance checks, public hearings, votes, and legal approvals inherent in the use of zoning and land readjustment. Thus, the coordination and the simultaneous implementation of these actions clarified the content of property rights, restructured plot boundaries, secured the value of entitlements, and allowed for the transfer of rights among landowners. In sum, their use made the re-assignment and transfer of rights possible. The following paragraphs present each of the main actions taken.

The preparation of a development plan was required to clarify existing development rights within the Syndicate. As mentioned earlier, about 14 hectares of the Syndicate area were zoned for long-term development, and the remaining 4 hectares were zoned as agricultural. However, zoning was not appropriate for the intended development, as it did not define clear densities, or planned access roads for future construction. Further, it covered only a portion of property subdivisions. As a consequence, development and infrastructure provision was costly, when possible, and landowners willing to develop

or sell their land faced high rent dissipation. To clarify landowner entitlements and adjust existing zoning regulations, landowners within the area chose to create a syndicate. The Syndicate implementation process entailed the preparation of a development plan tailored to the requirements of the area. For this purpose, the planners hired by the local authorities considered zoning regulations to be modified under the Syndicate (e.g. construction densities, public domain). They adjusted regulations on public spaces to the geographical attributes of the area (e.g. in terms of location, orientation, and design), and clarified landowner liabilities on parking and green spaces. Also, landowners used public hearings to interact directly with local authorities and negotiate the conditions of implementation of the development plan, such as the location of the constructible areas under the development plan. In sum, the development plan prepared under the Syndicate allowed for a closer involvement of landowners than in regular communal zoning schemes and clarified the content of entitlements, as it was tailored to local needs. As a result, landowner resources were allocated more efficiently and uncertainties on the definition of property rights reduced.

In parallel with the preparation of the development plan, property boundaries needed to be adjusted, as existing subdivisions were unsuited for development (e.g. inadequate size, shape, or absence of access to roads). Under the Syndicate, the restructuring of property boundaries was dependent on a majority vote by landowners gathered as an assembly. In other words, the Syndicate temporarily removed the capacity to exclude non-holders, which is inherent in each individual entitlement, and granted it to all members of the Syndicate, acting as a collective decision-maker. Thus, landowners jointly decided on the restructuring of property boundaries under the rules of the Syndicate. Among these rules, landowners had to approve land values for all land plots. Such decision-making built on the previous experts committee work which had defined the value of entitlements through a land survey, and land valuation before and after zoning changes. Based on the valuation of entitlements approved by landowners, entitlements became fungible (De Soto, 2000), which in turn made possible the restructuring of property boundaries. Landowners engaged in the process voluntarily, because the benefits of the Syndicate outweighed the costs, *i.e.* the Syndicate permitted more productive land uses at a later stage. Legal remedies against the decisions of the assembly were available to all landowners. In the example considered, no landowner opposed any assembly decision. The new property subdivisions were spatially congruent with development rights allocated by the development plan. In sum, the Syndicate created a community of title-holders that rendered property rights temporarily fungible and prepared land for more productive uses at a later stage.

Making property rights fungible required the protection of individual entitlement values. As the development plan elaborated under the Syndicate changed the value of plots of land (*i.e.* new rights were granted), landowner entitlements had to be secured throughout the entire process. To do so, the Syndicate used a calculation method that ensured the equal treatment of landowners. The principle of equal treatment is rooted in the Swiss Federal Constitution (art. 8), which prescribes the equal treatment of individuals and, as a corollary, proscribes discrimination. In the Syndicate, the landowner assembly delegated the calculation of the value of entitlements to the experts committee, which assessed the value of each plot of land within the syndicate area. Based on the proposed development plan, the experts committee conducted a second land value assessment of the entire Syndicate area. To calculate the new value of individual entitlements, the experts committee divided the new value of the sum of entitlements by the prior value of the sum of entitlements. Such a calculation allowed for a proportionate increase in the value of all entitlements, and a subsequent division of costs associated with the Syndicate (e.g. land servicing, administrative costs). In *Syndicat Derrière-le-Château*, the increased value of properties resulting from the development process (*i.e.* betterment or planning gain) remained in the hands of the

landowners, as there was no legislation or policy for public value capturing in place at the time². As previously mentioned, landowners possessed a legal remedy against any attribution of value considered unequal or unfair. For the Syndicate, these calculation methods proved successful for the definition of land values.

Having clearly established the new value of entitlements, the Syndicate organised the transfer of entitlements among landowners. Transferring property rights to their respective owners implied a re-allocation of land plots taking landowner preferences into consideration (e.g. in terms of location, land use). Depending on landowner interests and/or professional activity, participants could favour agricultural land, buildable land, or financial compensation. As the demand for constructible land is often higher, the transfer of agricultural land to landowners can be problematic. For example, all landowners might favour constructible land, requiring the division of agricultural land among landowners who have no interest in the land. In cases where one or more landowners receive all of the farmland, compensation equal to the value of their entitlement might be required. In the example considered, the existence of landowners with different preferences allowed for the matching of suggested land uses with landowner interests, and with the value of their entitlements. Thus, no major financial compensation needed to be paid to landowners, and existing rights were transferred in accordance with the value of the new land uses proposed by the development plan. Hence, the decision-making process triggered by the Syndicate transferred entitlements in accordance with the preferences of landowners. The result was a substantial increase of production, as the land zoned constructible under the development plan was developed, and agricultural land was cultivated in a rational way.

5. Discussion and Conclusion

The Coase Theorem affirms that, in dealing with externalities, where transaction costs are negligible and property rights can be clearly attributed, market transactions can lead to more efficient outcomes than state interventions, regardless of the initial allocation of resources. In other words, the Coase Theorem asserts that it is not always necessary to regulate externalities if there is a possibility of clarifying property rights and minimising transaction costs. As neither zero transaction costs nor fully defined and tradable property rights exist in the real world, the Theorem is concerned with accounting for the costs of coordination and the definition of property rights, and the role of government in reducing these costs and clarifying property rights. Through analysis of the Swiss policy instrument Land Improvement Syndicates, the intent of this paper is to inquire into the conditions necessary for 'Impure' Coasian solutions. LIS are designed to assist local authorities and landowners where property rights are inadequately defined, a re-allocation of development rights is necessary, and the development process affects multiple landowners. We used the *Syndicat Derrière-le-Château* in the commune of Cheseaux, Canton of Vaud, as an illustrative example.

This study shows that the Syndicate effected a reduction in transaction costs arising from the land development processes. In comparison with alternative policy choices, such as voluntary contractual agreements, the Syndicate appeared to reduce the time and effort landowners invested in the negotiations concerning the adjusting of property subdivisions and in changing zoning and land uses. As opposed to partial rezoning, this instrument proved to be a more popular solution among landowners. The Syndicate also brought landowners together by creating a landowner assembly, which had the effect

2. The 2014 revision of the Federal Spatial Planning Act (art. 5) introduced a mandatory 20% tax on value increments.

of reducing the number of transactors involved. The Syndicate also assisted the landowners in economising time and monetary resources by proportionately distributing costs and borrowing funds on their behalf. Further, the ground rules for decision-making within the landowner assembly facilitated negotiations among landowners: the majority vote and *one-person, one-vote* rules reduced decision-making costs and simplified the voting process. In addition, application of the equal treatment principle elevated the trust of participants in the process.

The Syndicate also facilitated negotiations among landowners by providing accurate and adequate information. The feasibility study provided landowners with the possibility to express their opinions and develop a better understanding of their preferences. Clarification of impending LIS procedures and potential outcomes lowered the risks of future appeals. Through the establishment of committees, the Syndicate mediated information asymmetries and uncertainties among participants. They provided specialist insights on rules, procedures and land values, acted as a broker when searching for developers and lenders, and aligned landowner preferences with local and broader land policy goals. The committees also fulfilled the role of a clearinghouse, securing payments and preparing land titles.

Further, the Syndicate clarified the assignment of property rights and facilitated their transferability. In close collaboration, local authorities, committees, and landowners prepared a development plan tailored to local requirements and were able to reassign the content of entitlements. The Syndicate also adjusted property boundaries in order to adapt plots to land development. This land readjustment was based on the fungibility of property titles, the values of which were assessed by a land survey both before and after Syndicate execution. The Syndicate temporarily removed the excludability of individual property rights by granting the right to make decisions on the use of the Syndicate area to all members of the landowner assembly. The landowners agreed to these modifications because: compensatory payments ensured all entitlements matched landowner claims; the transfer of property titles occurred in accordance with the preferences of landowners; the values of individual entitlements were protected; and the benefits of the Syndicate outweighed the costs. These benefits featured significant gains for landowners. In the case of *Syndicat Derrière-le-Château*, the development process increased land values by 287%, compared to the previous values, although no value capturing instruments were in place at the time of the Syndicate. These gains were sufficient to allow for the implementation of value capturing instruments, such as the 2014 tax on added land value created by zoning (art. 5 of Federal Spatial Planning Act-FSPA), without challenging the profitability of the development.

Land improvement syndicates facilitate landowner agreement by bringing landowners together, setting forth ground rules on collective decision-making processes, providing reliable and equitable access to information for involved actors, economising on planning and development costs, and clarifying and re-allocating property rights. The results hold significant implications for planning theory and practice. LIS provide alternative means to more direct forms of government intervention, internalising externalities and coping with market failures. In contrast with Pigovian approaches, which are often associated with high preparation and monitoring costs and can result in implementation gaps (Viallon et al., 2019, Schweizer, 2015), LIS grant landowners legal mechanisms for the reduction of transaction costs and the clarification of property rights, with limited government intervention. In these ways, LIS provide effective means for the realisation of 'Impure' Coasian solutions. 'Pure' Coasian approaches use contractual agreements that may prove unworkable where large number of parties are involved (Lai, 1997, Clinch et al., 2008). Alternatively, LIS constitute a landowner assembly which uses *one-person, one-vote* and majority rules to overcome situations where disagreements among multiple landowners may block decision-making processes. Consequently, landowners can reach an agreement and decide upon the re-allocation of property rights. Both implications could benefit from further analysis. In particular, more

attention should be paid to the formal and informal mechanisms that 1) provide information to participants, 2) frame negotiations between landowners and authorities, and 3) define decision-making rules in planning processes, as they have a substantial impact on transaction costs and on the clarification of property rights. Further, a discussion of LIS rules and procedures in light of Elinor Ostrom's (1990) design principles for a sustainable management of common pool resources may prove fruitful to 1) account for similarities and differences between LIS and 'traditional' commons, and 2) cross-fertilise theoretical insights from property rights and common pool resource theories.

Beyond the transaction costs and property rights considerations discussed above, the institutional design of LIS promotes the participation of landowners in land development processes through various means. Collective decision-making rules (e.g. *one-person, one-vote*) applied to the landowner assembly create a forum for discussion for landowners, while making collective choices more equitable. Participation is also open to non-landowners through popular votes on the local development plan, in conformity with Swiss legislation on spatial planning (art. 4 FSPA and art. 28 CPA). In various stages of LIS execution, public-sector planners must call for public hearings, in which local residents (i.e. any resident living in the jurisdiction including non-landowners) may inquire into LIS decisions on (art. 85p LBA): the definition of LIS areas, initial and final land values, infrastructure provision plans, infrastructure cost divisions among landowners, and infrastructure provision plans. These decisions are subject to public inquiry and appeal. Further, local authorities involved in the process act as representatives for local residents. This is in line with the literature on the planning decisions and 'Impure' Coasian solutions that involve large numbers of stakeholders (see Clinch et al. 2008). Further, LIS create more transparency in land development processes, compared to contractual agreements between landowners or between landowners and local authorities. Therefore, one outcome stemming from the execution of LIS is that collective decision-making rules and public scrutiny might constitute efficient and legitimate means for the reallocation of rights in contentious situations. Applying these principles to a larger number of land development projects can contribute to an increase in the transparency of land development processes, confer more legitimacy on land use policy, foster accountability to the public, and allow for the achievement of desirable policy outcomes.

This study analyses one of the executed LIS and has the advantages and limitations of a single case-study methodology. This approach provided the researchers with an in-depth understanding of the initiation and execution processes of *Syndicat Derrière-le-Château*. Despite the analytical generalisability of the arguments in this paper, we acknowledge that the empirical results of this study might not be fully applicable to all executed LIS in Switzerland or to land readjustment instruments in other countries. Nevertheless, we believe that some key empirical results of this study are replicable in other LIS in the Canton of Vaud, given they are executed under the same federal and cantonal legislations and follow the same policy procedures. *Syndicat Derrière-le-Château* is a typical example of LIS in the Canton of Vaud, which may increase the relevance of this study as it involves, for example, land use changes, inappropriate property subdivisions resulting in the need for land readjustment, disagreements among landowners, and provision of infrastructure. It is worth noting that most development processes in Switzerland privilege contractual agreements, and the use of LIS is marginal. As noted by Alterman (2012), land policy instruments, such as LIS in Switzerland, remain 'sleeping beauties' in advanced economies.

Acknowledgments

This paper is part of a research project funded by the Swiss National Science Foundation (SNSF grant no. 143057). The article is also supported by COST (European Cooperation in Science and Technology) Action CA17125 Public Value Capture of Increasing Property Values - Short Term Scientific Mission (STSM) scheme. The co-authors are listed alphabetically.

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