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**A transaction-cost analysis of Swiss land improvement syndicates**

Abstract: Land improvement syndicates (LIS) are a land-policy instrument that has been implemented in Switzerland to incorporate land readjustments, zoning changes and infrastructure provisions within a single instrument. These instruments address contentious situations, such as disagreements among landowners, inappropriate property subdivisions, problematic allocations of development rights, and the distribution of infrastructure provision costs. LIS redistribute added land values and costs of land development between landowners in a more equitable manner. While LIS have been in place for several decades, there have been limited studies on institutional aspects of these policy instruments, and particularly their associated transaction costs. In line with the transaction-cost economics theory, this paper considers the activities involved in the formation and execution of LIS as a series of transactions and discusses when and why transaction costs arise throughout the life cycle of the policy instrument. To this end, this paper uses an LIS case study in the commune of Cheseaux, Canton Vaud. The results of this paper show the variance of transaction costs across time, actor and activity. Activities such as preparation of the feasibility study and infrastructure provision are among those that appear to generate particularly considerable transaction costs. In addition to this, there is evidence of lengthy negotiations surrounding the existing and future land values and redistribution of development rights.

Keywords: Land improvement syndicates (LIS), transaction costs, institutional arrangements, land readjustment, policy life cycle

**Introduction**

Land development processes entail complexities, particularly when there are multiple landowners involved. Where there is mutual agreement among landowners, the process might be more straightforward as landowners are able to reach contractual agreements with no policy intervention and can start the development process under the planning system. However, this is not always the case. For example, landowners might disagree on issues such as future land use, land sale prices, the allocation of development rights and their share of infrastructure provision costs (Hong, 2007; Farthing, 1995; Callies, 2000). Unclear or disputed property boundaries and pre-existing easements may also add to the complexities. These disagreements can lead to substantial time delays in



the development process or even to a deadlock (Buitelaar, 2007; Miceli and Segerson,

2012; Condessa et al., 2015). As a result, the outcome might be a suboptimal use of land from both public and private points of view.

In Canton Vaud in Switzerland, local authorities use land improvement syndicates (LIS) as a policy instrument to facilitate land-development processes involving multiple landowners (Weber et al., 2011). LIS aim to assist landowners to reach agreements regarding the development of their properties through creating an assembly of involved landowners. LIS not only prepare spatial planning and design for a defined area, but also make decisions on (re)structuring property shapes and boundaries and dividing the costs and benefits of development among the participating landowners. LIS provide an opportunity to coordinate and conduct land readjustments and zoning-change procedures simultaneously and using the same mechanism. Without these syndicates, disconnected and lengthy processes might occur (Prélaz-Droux, 2009). This means LIS allow concurrent readjustment of property shapes, boundaries and rights with the required zoning changes applied to the area. Thus the outcomes of LIS are facilitated decision-making processes among involved actors, reallocations of development rights, zoning changes, land readjustments, infrastructure provision and divisions of the costs and benefits of land developments among landowners.

Like any other policy instrument, the formation and execution of LIS create transaction costs. These costs arise from activities such as negotiation between landowners and local authorities, negotiation among landowners themselves, collection of information, commissioning relevant surveys, hiring private planning consultants and other experts, and administrative costs. Nevertheless, the existing studies concerning LIS have not taken into account the transaction costs associated with these policy instruments. The present paper is an attempt to fill this gap by focusing on the institutional dimensions of the activities involved in initiating and executing LIS, and specifically their related transaction costs. Developing a better understanding of policy-related transaction costs is important because the magnitude, distribution and timing of such costs can have considerable influences on policy outcomes in terms of policy effectiveness, efficiency and equity (Coggan et al., 2013; Coggan et al., 2010; Shahab et al., 2018a; Rørstad et al., 2007). Such an understanding of transaction costs better enables

decision makers to design policy instruments that facilitate stakeholder engagement and are easier for local authorities to administer (Pannell et al., 2013; Shahab et al., 2017).

This paper aims to gain a better understanding of transaction costs arising from the activities involved in LIS. It particularly analyses (1) when and why these costs occur in each activity in the policy lifecycle of a land improvement syndicate, and (2) by whom such costs are incurred. To this end, we break the process of initiating and executing LIS into a set of activities and transactions and identify the corresponding transaction costs for each activity or transaction. This approach is in line with the other research on



policy-related transaction costs in the planning literature (Tan et al., 2012; Cho, 2011; Shahab et al., 2018c). Even though we identify the activities that are costly, this paper does not aim to provide an estimate of the magnitude of these policy-related transaction costs, which can be a separate research topic of interest. In terms of the structure of the paper, we first present a brief review of the literature on LIS and transaction-cost economics theory. Then, we introduce the Syndicat Derrière-le-Château as our case study, and present the methodology used for this research. The paper goes on to analyse the timing and distribution of policy-related transaction costs in the syndicate case study.

**Land improvement syndicates (LIS)**

LIS derived from rural land readjustments which aimed to adapt agricultural land plots for modern machinery in Switzerland (Courdesse, 2014). Based upon the federal legislation on land readjustment, Canton Vaud, located in the south-west of the country, has been the only canton that has introduced the LIS as a land-policy instrument. Local authorities in Canton Vaud have executed more than 20 LIS since the 1990s. LIS facilitate the development of large areas that faced development constraints arising from land hoarding and fragmented or inappropriate property subdivisions (Leroy, 2008). LIS conduct land readjustment, zoning changes and infrastructure provision for a defined area, while distributing the relevant costs and benefits among participating landowners in an equitable manner. Where there is

a disagreement among landowners and voluntary contractual agreements cannot be achieved, LIS provide a policy solution. LIS are also an alternative to more coercive tools such as mandatory readjustment or expropriation that require direct government intervention and public funds (Schneider et al., 2003; Tillemans et al., 2011).

The use of LIS provides several benefits. LIS are legally entitled to borrow required funds to finance infrastructure provision (Prélaz-Droux, 2009; Schneider et al., 2003). Although they might involve lengthy negotiations, the costs created by LIS have the effect of incentivising all involved landowners to speed up the development process in order to obtain a quicker return on investment (Tillemans et al., 2011). LIS can create ‘crowding-out effects’ as landowners unwilling to participate might sell their land to others (Viallon, 2017), creating a higher level of homogeneity and common preferences among remaining participants. Further, the use of LIS is compatible with strong property-rights regimes like in Switzerland (Viallon et al., 2017; Knoepfel et al., 2007; Gerber et al., 2017).

Each syndicate consists of four main actors: (1) a landowner assembly, which agrees on the syndicate action area and decides upon land readjustment and infrastructure provision; (2) a steering committee, which implements the decisions of the assembly; (3) an experts committee that includes planners, surveyors, and any other expert with required specialist knowledge; and (4) a management committee, which manages the



finances. The landowner assembly elects the three (steering, experts and management) committees. In a landowner assembly, decisions are taken based on a majority-voting rule in which each landowner is entitled to one vote. Weber et al. (2011) state that this rule can facilitate a compromise among landowners. Local authorities are responsible for the design and planning; they prepare a development plan specific to the syndicate area. The experts committee attempts to align the preferences of landowners with the goals of public authorities and land policy; they provide the assembly with professional advice on planning and development processes and negotiate with public-sector planners. Thus it is argued that LIS can bridge the gap between the interests of the public sector and private sector through the concomitant involvement of both sectors

within the land-readjustment and zoning procedures (Prélaz-Droux, 2009; 2008). The experts committee plays a mediator role in this process (Baud, 2016; Viallon, 2017).

**Transaction costs**

The concept of transaction costs was first introduced by Nobel laureate Ronald Coase (1937) and further developed by prominent new institutional economists such as Oliver Williamson (1975; 1985), Douglass North (1990; 1992), Harold Demsetz (1968) and Steven Cheung (1973). There are several definitions of transaction costs in the literature. McCann et al. (2005), Allen (1999) and Wang (2007) present a summary of these definitions. The most commonly used definition considers transaction costs as the non-production costs of an exchange or transaction (Nilsson and Sundqvist, 2007; Webster and Lai, 2003). According to Williamson (1985, 1), 'a transaction occurs when a good or service is transferred across a technologically separable interface. One stage of activity terminates and another begins'. This transfer can also be associated with the provision or exchange of information and ideas. Williamson (1981; 1996; 1998) describes the characteristics of a transaction in terms of asset-specificity (i.e. the degree to which the investments are specific to a particular transaction), frequency (i.e. the number of transactions that occurs in a period of time) and uncertainty (i.e. a situation that involves inadequate or asymmetric information). Asset-specificity and uncertainty have a positive association with transaction costs; high degrees of asset-specificity and uncertainty increase transaction costs. Frequency, on the other hand, has a negative effect on transaction costs; frequent transactions can lower uncertainty over the transaction, and consequently reduce transaction costs. The characteristics of transactors, such as opportunism and trust, also influence the level of transaction costs. Whilst trust and confidence in information shared between parties can reduce transaction costs, opportunistic behaviour, which Williamson (1993) refers to as 'self-interest seeking with guile', increases transaction costs.

Since the introduction of transaction costs into planning literature by Alexander in his paper 'A transaction cost theory of planning' in 1992, some researchers have used

the transaction-cost economics theory in advancing planning theory (Sager, 2006; Alexander, 2001; Slaev, 2016; Dawkins, 2000; Needham and de Kam, 2004) and in analysing planning issues and policy instruments (Buitelaar, 2004; Shahab et al., 2018b; Darabi and Jalali, 2019; Cho, 2011; Lai and Tang, 2016; Tan et al., 2012). In the context of a planning-policy instrument, both public and private sectors experience transaction costs (Shahab et al., 2018c; McCann, 2013). For public-sector policy makers who design and administer the policy instrument, transaction costs are incurred due to the cost of time and effort invested in researching, creating, implementing, administering, monitoring and enforcing the policy. For private-sector individuals or groups who engage with or are affected by the policy instrument, transaction costs are incurred due to the cost of time and effort invested in learning about and interacting with the instrument (Coggan et al., 2015). These transaction costs include both time-related costs that refer to the costs of time spent on each transactional activity and the direct monetary expenses incurred in the policy design, implementation or participation processes (Falconer and Saunders, 2002; Shahab et al., 2018b).

**Methodology**

This research utilised a case-study approach to examine the process of formation and execution of LIS through the lens of transaction-cost economics. The use of case-study methodology, which is a well-established technique in the field of planning (Thomas and Bertolini, 2014), was particularly helpful in a policy research like the present paper, which requires a comprehensive understanding of complex behaviours and institutions within their real-life contexts (Ritchie and Spencer, 2002; Flyvbjerg, 2013). This paper analysed one land improvement syndicate that is located in Cheseaux, Canton Vaud, in Switzerland. The Syndicat Derrière-le-Château (Behind-the-Castle Syndicate), referred to as ‘the Syndicate’ in this paper, covered an area of 18.2 hectares. The Syndicate was formed in 2002 and dissolved in 2014. While the area was initially (i.e. before the Syndicate) divided into 30 land plots owned by 16 landowners, there were 17 land plots owned by seven landowners when the Syndicate was terminated (Figure 1). This Syndicate is an interesting case study for a number of reasons: (1) it involved major land-use changes;

(2) the lands were owned by both the private and public sectors; (3) there was a need for land-boundary readjustment from both public and private perspectives given the fragmented and inappropriate property subdivisions, access requirements and so on; (4) there were disagreements among landowners regarding the potential land development; and (5) inconsistencies occurred between the current zoning and development over the past decades. Despite their differences in terms of the size of area covered and the number of landowners involved, LIS in Canton Vaud have followed the same procedures and have reached the same level of success in terms of achieving their defined objectives. Thus some results of this study concerning the single case study of Syndicat

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Derrière-le-Château might be generalisable to other LIS in Canton Vaud.

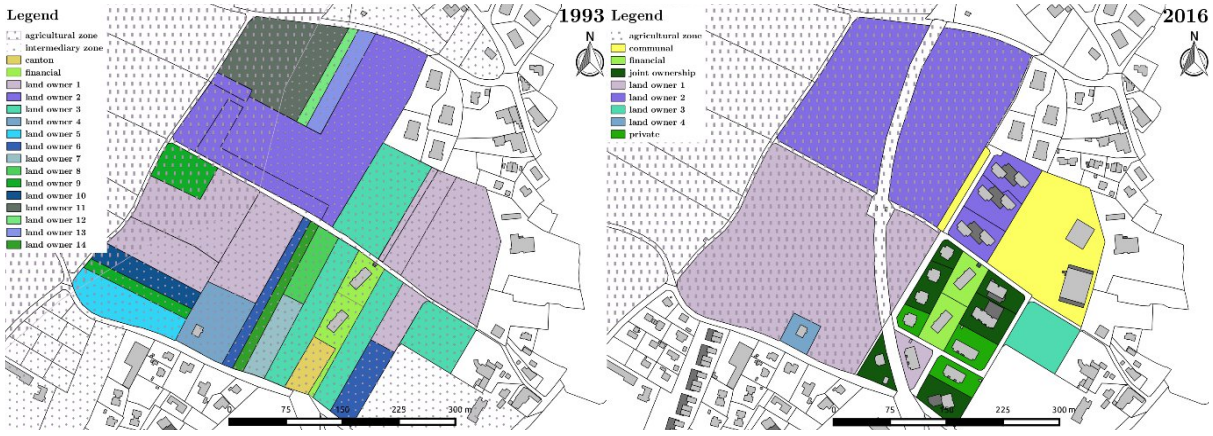


Figure 1 The area of Syndicat Derrière-le-Château before and after the policy intervention

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

This research employed both primary and secondary data to analyse policy-related transaction costs in the Syndicate. In terms of the primary data, the researchers conducted eight face-to-face interviews with representatives from different stakeholder groups, comprising the majority of individuals actively involved in the transactions of the LIS case study. These in-depth semi-structured interviews were conducted with two communal authorities (one with the former member of the communal executive committee and one with the head of communal planning),

the planning consultant involved, the surveyor who was in the experts committee of the Syndicate, the cantonal engineer in charge of supervising LIS, and three landowners. The researchers were unable to interview the notaries, developers and lenders involved. Interviewees were asked to explain the Syndicate process from their own perspective and report the relevant activities they had to go through and complete in chronological sequence. All of the interviews, lasting from 30 to 115 minutes each, were digitally recorded and anonymously transcribed by the researchers. Prior to the interviews, the researchers informed the interviewees about the objectives of the study, the details of the interviews and their voluntary and anonymous nature.

Secondary data, including policy reports and administrative documents, were also gathered and reviewed to supplement the data collected from interviews. These documents included (1) at the federal level, the LIS-related land and planning legislation; (2) at the cantonal level, the laws on planning and land readjustment, strategic plans and planning procedures; (3) at the communal level, the strategic, zoning and



infrastructure plans, the planning reports to the canton, the reports of the executive committee to the legislative committee and the minutes of the executive and legislative committees, (4) the general LIS procedural documents and guidelines; and (5) the Syndicate documents, including the reports, plans and minutes of assembly meetings and committees.

A chronological approach was used to analyse the primary and secondary data concerning the transaction costs of formation and execution of the Syndicate. This approach is a type of analytical technique of time-series analysis which seeks to trace phenomena over time (Yin, 2013; George and Bennett, 2005). This research examined the policy-related transaction costs across the life cycle of the Syndicate. To this end, and informed by transaction-cost economics theory which considers transactions as the ‘basic units of analysis’ (Williamson, 1998), the transactions in the process of initiating and executing the Syndicate were first identified in a chronological sequence. In this chronological-sequence analysis, these transactions were considered as time

points. Then, based on the identified transactions, the empirical data were coded and analysed. Such chronology was not used as a descriptive method; rather it enabled the researchers to analyse the policy-related transaction costs in an explanatory mode in which the empirical data were compared with explanatory theories.

**Analysing the Syndicate through the lens of transaction-cost economics**

There are several activities involved in the Syndicate that can be classified into two main stages of policy formation and policy execution. These activities can be seen as a series of transactions from the transaction-cost economics perspective, as discussed above. According to the interviews and document analysis, there are three main categories of activities in the Syndicate formation stage: agenda setting, feasibility study and institutional arrangement. In the Syndicate execution stage, design and planning, approval, implementation and termination are the four main categories of activities. The life cycle of the Syndicate started with the communal authorities and landowners identifying issues regarding the current zoning and property boundaries. The actors involved decided to create a land improvement syndicate to address these problems. To do so, the communal authorities and landowners hired private planning consultants, surveyors and notaries. After completing the planning, zoning changes and land readjustments and servicing, the life cycle ended with making final payments and dissolving the Syndicate. Table 1 presents the findings of this study outlining the examples of activities or transactions creating transaction costs and the main actors involved in each activity or transaction associated with initiating and executing the Syndicate. In the following sections, we discuss each of these categories of activities and their corresponding transaction costs in detail.

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*Table 1: Activities/transactions and their related transaction costs in the process of initiating and executing the Derrière-le-Château Syndicate*

| Stages | Category of Activities | Examples of transactions creating transaction costs | Main actors involved |
|---|---|---|---|
| Policy | Agenda | Identifying issues and problems | Communal authorities, landowners |

| Stages | Category of Activities | Examples of transactions creating transaction costs | Main actors involved |
|---|---|---|---|
| Formation | setting | Proposing initial policy choices | Planners, communal authorities, landowners |
| | | Modifying communal strategic plan | Planners, communal authorities |
| | | Calling for public meetings and hearings | Planners, communal authorities, landowners, public |
| | Feasibility study | Hiring planners and other relevant experts | Landowners, communal authorities |
| | | Preparing feasibility study report | Planners, surveyors |
| | | Receiving the inputs of landowners | Planners, surveyors, landowners |
| | | Evaluating alternative solutions | Planners, surveyors, landowners |
| | | Selecting the preferred policy | Planners, communal authorities, landowners |
| | Institutional Arrangement | Establishing landowner assembly | Landowners |
| | | Constituting Syndicate committees | Planners, surveyors, landowners, notaries |
| | | Setting up financial mechanism | Landowners |
| Policy Execution | Design and planning | Preparing development plan | Planners, communal authorities |
| | | Adjusting new property boundaries | Surveyors, planners, notaries, landowners |
| | | Computing estimated costs and gains | Surveyors |
| | Approval | Conducting conformance checks with other plans and legislations | Cantonal authorities, planners |
| | | Calling for public meetings and hearings | Planners, communal authorities, landowners, public |
| | | Voting for development plan | Communal authorities |
| | | Voting for new property boundaries | Landowners |
| | | Approving new property boundaries and development plan | Cantonal authorities |
| | Implementation | Preparing titles for new land plots | Cantonal authorities, surveyors, notaries |
| | | Making compensatory payments | Landowners |
| | | Taking out loans | Landowners, lenders |
| | | Contracting developers | Landowners, developers |
| | | Servicing the land | Developers |
| | | Making land service payments | Landowners, developers |
| | Termination | Conducting land surveys | Surveyors |
| | | Recording the surveys into land registry | Cantonal authorities, surveyors |
| | | Finalising the payments | Landowners, communal authorities |
| | | Dissolving the Syndicate | Landowners |

**Policy formation**

***Agenda setting***

In Cheseaux, the communal authorities decided to build a new school in the Derrière-le-Château area, which required the acquisition of land. They used an ongoing land-readjustment project related to the construction of a bypass road in the area to



acquire the land. However, the existing land-readjustment project solely concerned agricultural land-boundary adjustments and was unable to address the broader issues

surrounding the potential development of the area, such as required zoning changes and inappropriate property boundaries for future development. To address these issues, one possible solution was to rezone the area solely to favour building the school. However, there were high risks that the landowners would appeal against the rezoning as the area was zoned as an intermediary zone (i.e. long-term development zone) creating an expectation for the landowners that they would develop their lands at some point in the future. In other words, the partial rezoning would have created resistance to the project. This could lead to high levels of transaction costs arising from increased need for lobbying and negotiating with the landowners and dealing with subsequent appeals. As a result, the communal authorities proposed to modify the strategic plan to pave the way for using LIS as an alternative to the partial rezoning. According to the interviewed communal authorities in Cheseaux, the Syndicate reassured the participating landowners that they would be listened to and that they would be treated in an equitable manner. Therefore, the participatory nature of the Syndicate promoted trust among actors and increased the credibility of the project. These altogether reduced the transaction costs of using the Syndicate, compared to the unpopular partial rezoning. The other main activity of this phase, modifying the strategic plan, seemed to create considerable transaction costs. These costs arose from the need to hire planners, hold public hearings and ask the legislative committee for approval.

***Feasibility study***

After setting the agenda and proposing the LIS as a potential policy choice to address the issues surrounding required zoning changes and land readjustments in Cheseaux, the communal executive committee carried out a feasibility study for the use of LIS. The feasibility study primarily consisted of a draft of proposed land uses and property boundaries and an estimate of the potential costs and benefits associated with executing the Syndicate. It goes without saying that the proposals within the feasibility study needed to be in line with existing plans and legislation. Conducting the feasibility study began with the hiring of planning consultants and surveyors and can be considered a significant source of transaction costs in the Syndicate formation

process. The costs of hiring these experts were incurred by the communal authorities. For the costs over 10,000 francs, the communal executive committee required authorisation of the communal legislative committee. To minimise the transaction costs, the executive committee decided to keep the costs below the threshold through hiring the experts already involved in the ongoing land-readjustment project and those who were familiar with the area. Given that these experts were previously hired by some landowners and communal authorities, they promoted trust among the actors, which had the effect of reducing the level of transaction costs in the current and later phases.

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To prepare the study, the experts met with all the involved landowners individually and asked for their input. These meetings were essential to develop a better understanding of the landowners' preferences and of whether they were in favour or against the land-use proposal and the changes in property boundaries. Whilst these meetings were time-consuming, they were instrumental for initiating and executing the Syndicate. The planner in charge of the feasibility study highlighted the importance of these meetings, stating,

"we did some sort of simulation, we discussed it with the landowners to see whether they would bite [sic]. Feasibility study is what makes the whole thing work. If there were no feasibility study, [the Syndicate process] would be a complicated, cumbersome, and costly process for people." (Interview 1)

The possible outcomes of the feasibility study could have been threefold: initiating a land improvement syndicate, making contractual agreements or no action at all. Because of the complex nature of the changes in the proposed land uses and property boundaries, along with the willingness of the majority of the landowners to go ahead with the proposals, LIS was suggested as the preferred policy instrument. It is worth mentioning that since the result of the feasibility study was positive and the landowners and communal authorities decided to go ahead with initiating the Syndicate, the costs of conducting the feasibility study were transferred to the landowner assembly at a later phase.

***Institutional arrangement***

The first step in constituting the Syndicate was inviting all 16 landowners to create the landowner assembly. Although the majority of the landowners were willing to establish the Syndicate, there were a minority of landowners who lacked interest in participating in the Syndicate process. The main reason behind their unwillingness was the high transaction costs involved in the process, for example the costs of planning and infrastructure provision that had to be paid by all the landowners involved in the Syndicate. One of these landowners stated, ‘what was I going to do with my land? I could not pay [for infrastructure], so what did I do? I sold to those who wanted to build’ (Interview 2). Also, among the majority group, there were some landowners who owned small plots, who decided to sell their properties to the other landowners and opt out of the Syndicate. As a result, from the initial 16 landowners, only seven joined and remained in the assembly. This had a decreasing effect on transaction costs, due to the lower number of transactors involved. This is in line with the policy-related transaction-costs literature (McCann, 2013; Stavins, 1995; Shahab et al., 2019). Evidence supporting the presence of opportunism and rent-seeking behaviour was found, particularly in the process of creating the landowner assembly and purchasing the other actors’ properties. One of the landowners stated, ‘there were a bunch of landowners who owned small land plots that they were unable to get constructible plots out of them ... So we pursued an



acquisition strategy, because it would augment our own shares [of land development]’ (Interview 3). However, we did not find evidence that these rent-seeking behaviours have a considerable influence on the transaction costs of initiating the Syndicate. The other activities involved in the institutional arrangement step (i.e. constituting the Syndicate committees and setting up the financial mechanism) were rather straightforward tasks that did not generate substantial transaction costs. This was mainly due to the initial negotiations carried out in the previous phases. The Syndicate committees comprised planners, surveyors and notaries. The landowners decided to elect the experts who were in charge of preparing the feasibility study as they had confidence in the information and advice provided by them. This confidence decreased the transaction costs of landowners through decreasing the information collection time and effort.

**Policy execution**

***Design and planning***

The design and planning of the Syndicate area is the first category of activities in the Syndicate execution stage. This stage includes three main activities: preparing the development plan, adjusting new property boundaries, and computing the estimated costs and gains. The communal authorities were responsible for preparing the development plan. One of the key considerations of the development plan was to preserve parts of the agricultural land while directing potential development to more suitable areas. In other words, the communal authorities were willing to develop the land closer to the town centre where there was higher demand for development and preserve part of the land which was further from the town centre and being used as farmland. Thus, in the development plan, 11.5 out of 18.2 hectares of land in the Syndicate were allocated to farmland. The challenge was to find people who were interested in owning land designated for both land uses, particularly the farmland. It goes without saying that the demand for the land designated for development is often higher, given its higher added value compared to that allocated for farming. This could have potentially created a problematic situation due to the need for the landowners to either compensate the owner(s) of farmland or divide the farmland equally among themselves. Both alternatives could have generated high levels of transaction costs resulting from increased time and effort involved in the negotiations and contracts. Nevertheless, due to the availability of landowners with different preferences, designating land with different land uses among the landowners was rather a straightforward task. As the cantonal engineer in charge of supervising LIS put it, “things are easy if there are farmers involved [in LIS]. Because you have people interested in getting a lot of land with little value, and others interested in getting small land plots with high value. This way you balance two different needs ... If you have only people who want to build, it’s more complicated.” (Interview 4)



The development plan and the new property boundaries were interconnected

and prepared simultaneously. Unlike the preparation of the development plan, which was paid by communal authorities, the landowner assembly incurred the costs of surveying and adjusting new property boundaries. The surveyors designed the new property boundaries according to the size, use and location of the previous land of each landowner; the proposed land use; and the estimates of the values of the new parcels. These considerations played the key role in computing the gains derived from the development process for each landowner. According to the interviews, the uncertainties and ambiguities surrounding the existing and future land values created lengthy negotiations among all the actors, and consequently high transaction costs. In an effort to lower the risks of opportunism and rent-seeking behaviours, the experts committee suggested giving the same unitary value to all existing land plots within the Syndicate area. This suggestion not only simplified the calculation but also ensured the equal treatment of the landowners, regardless of the features of the lands they owned. One of the landowners confirmed this, stating, 'I think it helped us save time ... Starting from there, the landowners had less fear ... It set common grounds for the further negotiations' (Interview 3).

***Approval***

After the design and planning phase of the Syndicate area, the relevant authorities had to approve the development plan and the new property boundaries. The main activities involved in this phase were conducting conformity checks with other plans and legislation, calling for public hearings, voting for the development plan, voting for new property boundaries, and official approval of new property boundaries and development plans. The cantonal authorities checked the proposed development plan to determine whether it complied with the requirements of other plans and legislation. There was an exception in this conformity-testing requirement with regard to the proposed school. To accelerate the development of the proposed school, the communal executive committee decided to carefully follow the requirements of the communal strategic plan (which already had been approved by the communal legislative committee) and hold an architectural competition. Following these procedures exempted the proposed school development

plan from the cantonal conformity-testing requirement, as well as the need for voting in the communal legislative committee. This lowered the related transaction costs through reducing the time and effort that the communal executive committee had to put in authorising the proposed school development plan.

Apart from the proposed school development plan, the rest of the development plan required public hearings and voting. While any resident of Cheseaux could attend the public hearings, only the members of the communal legislative committee could vote on the plan. Given that the cantonal authorities prohibited the development around the bypass road, which put development restrictions on some land plots, the property owners



opposed the proposed development plan. This enlarged the associated transaction costs through increasing the need for further negotiations to address the disagreements. In the case of no consensus, the property owners could take the case to the court, which would result in major delays to the entire process. Nevertheless, the communal executive committee eventually made a compromise and resolved the issue through modifying the plan and transferring the development rights to adjacent plots. The communal legislative committee subsequently approved the development plan.

Unlike the development plan that needed the approval of the communal legislative committee, the landowner assembly had to approve the new property boundaries on a simple majority basis (majority-voting rule). To do so, the assembly held a meeting and asked for the landowners' votes, where each participating landowner had only one vote regardless of the size or value of their properties (one-person–one-vote rule). These voting rules, which are part of the LIS procedure in Canton Vaud, seemed to facilitate the decision-making process through (1) simplifying the process, i.e. making it easy to understand for the participants and simple to administer; (2) creating balanced bargaining power among the landowners, i.e. the voting rules did not give anyone a higher degree of bargaining power; (3) building trust among the actors involved by ensuring the equal treatment of the landowners; and (4) reducing the risks of rent-seeking behaviours, i.e. decreasing the potential dominance of owners with larger or more valuable properties over the decision-making process and outcomes. This

is in line with the Buchanan and Tullock's (1962) argument on the lower decision-making costs of the majority rule in comparison with the unanimity rule. Once the majority of landowners approved the design of new property boundaries, unsatisfied landowners could make appeals against the decision. Given the strong engagement of landowners in the design and planning phase and ensuring their inputs were reflected in the development plan and new property boundaries, the negotiations associated with the approval phase were rather smooth. The last activity in this phase was the approval of the development plan and new property boundaries by cantonal authorities, which was reportedly a straightforward task.

***Implementation***

Once the cantonal authorities had approved the development plan and the new property boundaries, the assembly and experts committee could proceed with the implementation phase. The implementation phase covers preparing titles for new land plots, making compensatory payments, taking out loans for infrastructure provision, contracting developers, servicing the land and making land-service payments. The experts committee prepared the titles for the newly shaped land plots and submitted the relevant transfer documents to the land registry. Any pre-existing rights or easements, as well as any outstanding debts or mortgages, were transferred to the new properties. The interested parties, including the landowners, lenders and easement holders, could



oppose the property transfer; however, it did not happen in the case of the Syndicate. Although the experts committee tried to design the new property boundaries in a way that reflected the existing property value of each landowner, there were still some disparities between the allocated shares. Therefore compensatory payments had to be made to those landowners who were disadvantaged in the proposed property subdivisions. The experts committee computed these compensatory payments.

Furthermore, the experts committee calculated the costs of conducting the feasibility study, preparing the design of new property boundaries, commissioning the relevant surveys, providing infrastructure and administration. Then they attributed

these transaction costs between landowners as a function of the value of their existing properties. Among these direct monetary expenses, the infrastructure provision with four million francs had the largest share. The communal authorities absorbed 780,000 francs from the costs of infrastructure provision and the landowner assembly had to take out loans to fund the rest. According to the interviews, finding a lender was a difficult and time-consuming activity as most banks did not accept the approved development plan as a sufficient guarantee for giving out such substantial loans. The landowner assembly also had to pay 12,000 francs to the executive and management committees. As mentioned above, the communal authorities covered the costs of preparing the development plan. Finally, the Syndicate presidency contracted developers for servicing the land plots.

***Termination***

The last category of activities in the life cycle of the Syndicate was termination. This category consists of different activities including conducting land surveys after the servicing, recording the surveys into the land registry, finalising payments and dissolving the Syndicate. Conducting land surveys was necessary because servicing the land (e.g. building roads and sidewalks) had made changes to the property boundaries. Landowners paid the costs of commissioning the land surveys that were subsequently recorded into the land registry. The result of the land surveys was used for the land valuations that had implications for the compensatory payments. Therefore there was a need for a final calculation of the costs attributed to each landowner. To dissolve the Syndicate, two conditions had to be met: guaranteeing the maintenance of infrastructure and finalising the payments. In the Syndicate, after lengthy negotiations with the landowners, the communal authorities agreed to take the responsibility of maintaining the infrastructure. Alternatively, the landowners could have established a maintenance syndicate to look after the infrastructure of the Syndicate area. The dissolution of the Syndicat Derrière-le-Château was delayed as it took the landowners several years to finalise all payments.

**Summary and conclusions**

Local authorities use different policy instruments, often in isolation, to address various land-use and development issues in different jurisdictions. Swiss communal authorities implement land improvement syndicates to provide a systematic tool to help communities achieve a wide range of policy objectives, such as land readjustments, zoning changes, land preservation and financing infrastructure provision. Instead of addressing each issue with an individual instrument, LIS allow one to deal with interconnected and complex land-use and development issues in an integrated manner within a single instrument. LIS enable landowners to share the costs and benefits of land-development transactions in an equitable manner, i.e. proportionate to the value of their existing properties. These syndicates consist of various activities creating transaction costs (as we outline in Table 1). This paper has aimed to analyse the activities and transactions involved in initiating and executing LIS and their corresponding transaction costs. A better understanding of the policy-related transaction costs is important as they have implications for policy efficiency, equity and effectiveness, and might influence the overall success of policy instruments. We examined the case of Syndicat Derrière-le-Château in the commune of Cheseaux with the aim of expanding our understanding of when and why transaction costs occur and who bears these costs throughout the life cycle of the Syndicate. While this study focused on analysing one land improvement syndicate, its findings might be relevant and generalisable to other LIS in Canton Vaud, Switzerland, given that they follow the same policy procedures and work under the same federal and cantonal legislation.

The results of this study showed that transaction costs varied across the life cycle of the Syndicate, as well as among different actors involved in each activity or transaction. The process of initiating the Syndicate consisted of three categories of activities, including agenda setting, feasibility study and institutional arrangement. Multiple lengthy negotiations characterised the stage of policy formation, particularly in modifying the communal strategic plan, preparing the feasibility study, establishing the landowner assembly and holding public meetings and hearings. The introduction

of the LIS as the policy choice was to avoid costly alternatives, such as the partial rezoning which proved unpopular among the landowners involved. The Syndicate provided a resolution to the zoning and property issues, whilst also building trust among the actors. Preparing the feasibility study was a major transaction-cost-generating activity as several experts were hired to collect the preferences of the actors and evaluate the options. Nevertheless, according to the interviews, carrying out the study seemed to reduce the negotiation time and effort at later stages through preventing potential conflicts among the actors. The interviewees also pointed out the transaction-cost-reducing effect of engaging with the experts previously hired by the landowners and communal authorities: this cost-reducing effect is the result of promoted trust among the actors involved. Such an approach can be used by other



jurisdictions when initiating and executing LIS. During the assembly establishment, some landowners opted out of participating in the Syndicate for various reasons. This seemed to lower transaction costs through reducing the number of transactors and increasing the homogeneity of their preferences. Although we found evidence of some rent-seeking behaviours, we could not affirm their influence on the costs arising from the policy formation.

The Syndicate execution stage was classified into four categories of activities, including design and planning, approval, implementation and termination. The transaction costs generated in this stage included both time-related costs and direct monetary expenses. The time-related costs arose mainly in preparing the development plan, adjusting the new property boundaries, taking out loans and holding public meetings and hearings. In particular, the uncertainty surrounding existing and future land values led to lengthy negotiations among landowners and surveyors. According to the interviews, assigning the same unitary value to all the existing land plots assisted reaching an agreement among the landowners in the Syndicate. In a land improvement syndicate where such an assignment is not possible (e.g. due to the existence of high disparities in land values or other complexities surrounding the attributes of land plots), obtaining an agreement might be more cumbersome, leading to higher degrees of transaction

costs as a result of the increased need for lengthy negotiations. The main sources of the direct monetary expenses were commissioning the relevant surveys, financing the infrastructure provision and administrative costs. While the communal authorities bore the costs involved in preparing the development plan and part of infrastructure provision, the landowners incurred the costs associated with adjusting the new property boundaries, commissioning the surveys, and the rest of infrastructure-provision costs. Within the landowner assembly, the voting rules (i.e. majority-voting and one-person–one-vote rules) seemed to effectively support the decision-making processes through reducing the levels of complexity, balancing the bargaining power among landowners, building trust among the landowners, and decreasing the risks of opportunism. While this paper focused on the timing and distributional aspects of transaction costs in initiating and executing land improvement syndicates, further research with more focus on the estimate of these costs is suggested.

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