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Timing and Distributional Aspects of Transaction Costs in Transferable Development Rights Programmes

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Abstract

Planners are required to evaluate planning policy instruments to develop a better understanding of how they can improve their policy design and implementation processes. Transferable Development Rights (TDR) programmes are one of the market-based policy instruments that have attracted considerable attention among planners and economists. Given that TDR programmes have been introduced as an alternative to traditional regulatory instruments in several jurisdictions on the basis that their implementation will result in better policy outcomes, evaluation of these alternative programmes is particularly important. Like all policy instruments, the activities concerned with the design and implementation of TDR programmes may involve significant transaction costs. These activities can be considered as a series of transactions from the perspective of Transaction Cost Economics (TCE). While transaction costs are expected to vary across the lifecycle of a policy instrument, up to now there have been no systematic research studies concerned with why, and how, such transaction costs occur and are distributed among parties involved in different phases of TDR programmes. In order to aid better design and implementation of TDR programmes, this paper analyses the effects of transaction costs throughout the life of four TDR programmes (Calvert, Montgomery, St. Mary's, and Charles Counties) in the US state of Maryland in order to gain a better understanding of the timing and distribution of such costs incurred by different parties involved.

Keywords: Transferable Development Rights (TDR), Transaction Cost Economics (TCE), Planning Policy Instruments, Institutional Design and Arrangements, Policy Lifecycle.

1. Introduction

Managing the externalities of development is critical in developed and developing countries as is ensuring that the costs of environmental preservation are minimised and the benefits of development are shared more equitably. Regulatory policy instruments, such as zoning and development control, have traditionally been the dominant approach in achieving such planning objectives. Having recognised some drawbacks of these instruments, an increasing number of economists/planners have been proposing the implementation of market-based instruments (MBIs) (Clinch, O'Neill, & Russell, 2008; Janssen-Jansen, Spaans, & van der Veen, 2008; Micelli, 2002; Turk & Demircioglu, 2013). MBIs change the costs and benefits of agents' actions by making preferred social and environmental outcomes financially more attractive (OECD, 1999). MBIs are arguably more statically (least-cost) and dynamically (encourage continuous improvement) efficient and more equitable (due to their

redistribution mechanism), and also involve fewer transaction costs compared to traditional regulatory instruments (Hahn & Stavins, 1992; Jaffe & Stavins, 1995; Lockie, 2013; Stavins, 2001; Whitten, Van Bueren, & Collins, 2003).

The Transferable Development Rights (TDR) approach is one MBI that has received considerable attention in a number of developed and developing countries (Janssen-Jansen et al., 2008; Shahab & Azizi, 2013; Spaans, Janssen-Jansen, & van der Veen, 2011; Wang, Tao, Wang, & Su, 2010) and has been implemented to address different land preservation/development objectives. Using a zoning system, development rights can be transferred from so-called 'sending areas' that are less desirable for development from a public-policy perspective, to designated areas for development – so-called 'receiving areas'. Landowners of sending areas receive payment for the sale of their properties' development rights. Developers may purchase additional development rights from sending areas if they wish to develop beyond a specific permitted level in receiving areas (Machemer & Kaplowitz, 2002; Nelson, Pruetz, & Woodruff, 2011).

Some researchers have studied factors affecting TDR success (Aken, Eckert, Fox, & Swenson, 2008; Chan & Hou, 2015; Kaplowitz, Machemer, & Pruetz, 2008; Machemer & Kaplowitz, 2002; Pruetz & Pruetz, 2007). While transaction costs, and other institutional aspects of a policy, can affect the efficiency, effectiveness and equity of policy instruments (Buitelaar, 2007; Dawkins, 2000; McCann, Colby, Easter, Kasterine, & Kuperan, 2005; Shahab, Clinch, & O'Neill, 2018a), so far, there has been little research concerning institutional aspects and related transaction costs of TDR programmes. While, in theory, TDR programmes should lead to low transaction costs (Field & Conrad, 1975; Micelli, 2002), in practice, such transaction costs involving the design and implementation of these programmes can be very high (Bruening, 2008; Chomitz, 2004; Messer, 2007; Shahab, Clinch, & O'Neill, 2018b) involving costs that vary across time (i.e. the lifecycle of a policy instrument), which may also be distributed unevenly among parties (Coggan, Whitten, & Bennett, 2010).

This paper addresses this issue by analysing the process of designing and implementing TDR programmes through the lens of Transaction Cost Economics (TCE). The main objective is to analyse when transaction costs arise and by whom such costs are incurred. The paper investigates the effects of transaction costs in different phases of designing and implementing TDR programmes, and examines the distribution of such costs among different parties. In line with TCE literature, this paper considers activities concerned with the design and implementation of TDR programmes as a series of transactions. This approach has been used in several other studies (Alexander, 2001a, 2001b; Cho, 2011; Tan, Beckmann, Qu, & Wu, 2012; D. B. Thompson, 1999; Whittington & Dowall, 2006), but has not been applied in the study of a planning policy instrument, such as TDR. To this end, we briefly review previous studies concerning TDR evaluations, as well as the literature on TCE. Then, through identifying transactions in the process of designing and implementing TDR programmes, this paper analyses the distribution and timing of related transaction costs arising in each phase of this process.

2. Evaluation of Transferable Development Rights (TDR) Programmes

Since the introduction of TDR programmes in planning in the late 1970s (Renard, 2007), researchers have attempted to evaluate these programmes (Aken et al., 2008; Chan & Hou, 2015; Kaplowitz et al., 2008; Machemer & Kaplowitz, 2002; McConnell & Walls, 2009; Pruetz & Pruetz, 2007). A review of this literature shows that most studies have taken a conformance-based evaluation approach assessing the degree of conformity between outcomes of an implemented programme and its specified objectives (Faludi, 1989; Shahab, Clinch, & O'Neill, 2017). For example, Machemer and Kaplowitz (2002) define the degree of success of a programme based on the number of completed TDR transactions and the number of acres preserved. This approach has at least two main drawbacks. Firstly, the specified policy objectives are not necessarily all the outcomes of a policy (Shahab et al., 2017).

While evaluating such criteria is necessary, it is not always sufficient, largely because of side-effects (Mickwitz, 2013). Thus, conformance-based evaluation only enables planners to evaluate partial outcomes of programmes (i.e. the intended outcomes). Secondly, this approach usually neglects to take account of transaction costs, and other institutional aspects, in the design and implementation of programmes. This paper focuses on an aspect of the second drawback of the conformance-based approach that has, thus far, received little attention in TDR studies, namely, institutional aspects of the design and implementation of TDR programmes.

3. Transaction Cost Economics

As one of the central concepts and significant contributions in New Institutional Economics (NIE), 'transaction costs' were conceptually introduced by Nobel Laureate Ronald Coase (1937) in his seminal paper 'The Nature of the Firm' as simply 'the cost of using the price mechanism'. These costs are defined as *"all costs other than the costs of physical production"* (Lai, 1994, p.84). In TCE, the transaction is the 'basic unit of analysis' (Williamson, 1998). A transaction can be defined as an agreement between two or more parties to exchange goods, services, and payments that can be organised in different ways. A transaction is an intention to undertake an 'action of economic or other value' (Dixit, 1996) where, through a contract, buyers and sellers agree to exchange or provide products, properties, services, human resources, and intellectual or other forms of capital.

While the impact of transaction costs on the efficiency of a policy has been discussed (Buitelaar, 2007; Dawkins, 2000; Rørstad, Vatn, & Kvakkestad, 2007), there has been limited consideration of the distribution of such costs. Transaction costs incurred by the different parties are expected to vary widely (Coggan et al., 2010; McCann et al., 2005), according to policy approach and its relevant institutional design and arrangement. According to Coggan et al. (2010), the actions and interactions between private and public parties can have an upward or downward influence on the significance and distribution of transaction costs. Prior research shows that both private and public transaction costs can be significant (McCann & Easter, 2000; Mettepenningen, Verspecht, & Van Huylenbroeck, 2009; Rørstad et al., 2007). Therefore, particular attention should be paid to their distribution among the parties involved.

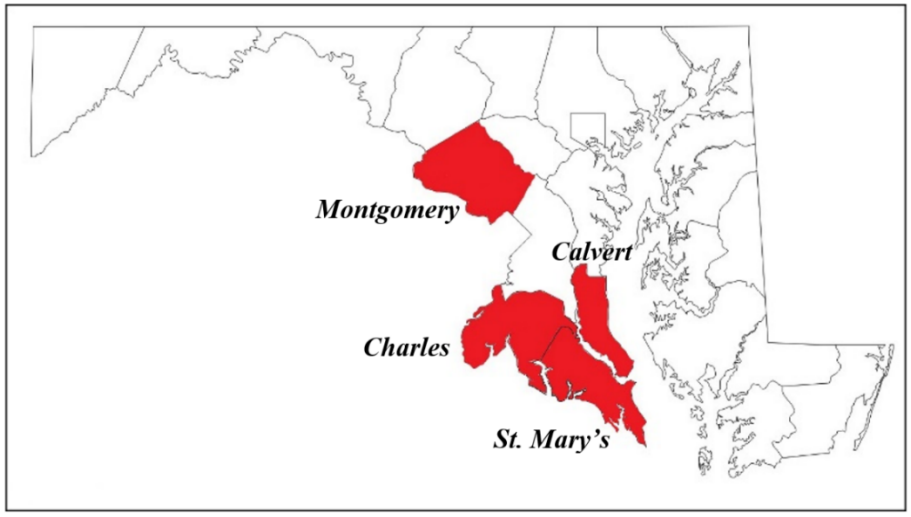
Transaction costs include all of the costs associated with the design and implementation of a policy instrument and can be decomposed into *ex-ante* and *ex-post* transaction costs (Hennart, 1993; North, 1990; Williamson, 1985). *Ex-ante* costs refer to costs that arise before the actual transaction, whereas *ex-post* costs are costs that occur after the transaction. The type, magnitude, and distribution of transaction costs associated with policy decision and implementation are not equal for each stage of these activities and vary over the lifecycle of a policy (Coggan et al., 2010; Falconer, Dupraz, & Whitby, 2001). Thus, in order to analyse adequately the transaction costs of TDR programmes, all stages should be considered.

4. Methodology

A case-study methodology was utilised to analyse the process of designing and implementing TDR programmes through the lens of TCE. Four TDR programmes in the US state of Maryland were selected, including Calvert, Montgomery, St. Mary's, and Charles Counties (Figure 1). These counties are located at different distances from Washington D.C., and experience different levels of development pressure. Calvert and Montgomery Counties were initiated in 1979 and 1980, respectively. These programmes have been successful in preserving areas that specified for protection (McConnell et al., 2007; Walls & McConnell, 2007). St. Mary's and Charles Counties, initiated in the 1990s, are viewed

as having been less successful, in that they have preserved limited amounts of land (Dehart & Etgen, 2007; McConnell et al., 2007).

Figure 1: TDR case-study areas in the State of Maryland, US



Semi-structured interviews were used to collect qualitative data from different parties involved in the TDR transactions in each TDR case-study area. A semi-structured interview approach was chosen as it enabled the tailoring of questions to the participants' positions, experiences and interview context (Galletta, 2013; May, 2011). Interviews were conducted with 46 participants in the four TDR programmes between March and July 2016. These key stakeholders included TDR sellers (landowners and farmers), TDR buyers (developers), and key personnel from the programme administration and planning departments. Since a large number of TDR transactions occurred with the assistance of a land-use attorney and/or a broker, representatives from these intermediaries were also interviewed (Table 1).

Table 1: Number of stakeholders interviewed in each TDR case study

Participants	Landowners	Developers	Local Authorities	Intermediaries
Montgomery County	3	3	5	4
Calvert County	2	2	5	2
St. Mary's County	2	2	4	4
Charles County	2	2	2	2
Total	46			

To ascertain when transaction costs arise, and by whom such costs are incurred, using open-ended questions, we asked interviewees to guide us through the process as they experienced it. A number of subsequent questions were asked to gain a firm understanding of their experiences and the process involved. Open-ended questions were asked to provide the maximum flexibility for the participants in structuring their comments (Aberbach & Rockman, 2002). Interviews lasted from 45 to 90 minutes. The authors transcribed the audio-recorded interviews *verbatim*. In order to analyse the interviews, the transactions in the process of designing and implementing TDR programmes were firstly

identified in a chronological sequence, as such transactions are the 'basic unit of analysis' in TCE. Then, using NVivo 11, the interviews were analysed and coded based on the identified transactions. As a triangulation technique, the authors reviewed related policy documents and administrative reports, such as, the recorded TDR prices and checklists of TDR application requirements.

5. Analysing TDR Programmes through the Perspective of Transaction Cost Economics

The design and implementation of TDR programmes involve several activities. From the TCE perspective, they can be considered as a series of transactions. In order to analyse when transaction costs arise and who bears these costs, we break the process of designing and implementing TDR programmes into a set of activities and transactions and, for each activity/transaction, corresponding transaction costs are identified. These activities are categorised into two stages of policy design and policy implementation. Each stage evokes a number of activities and transactions that create transaction costs. According to the interviews, the lifecycle of a TDR starts when TDRs are allocated in sending and receiving areas and a local ordinance enables landowners to create or certify TDR credits. Then, it continues as TDRs are sold or transferred from landowners to developers. Finally, the lifecycle ends by TDRs being retired or landed in development projects. The findings of the interviews are synthesised in Table 2, whereby we outline the sequence of activities in the TDR design and implementation process, together with the transactions which create transaction costs, and the main parties involved.

Dividing up an activity or transaction might be somewhat problematic as an activity/transaction can often be broken up into a further set of activities or transactions (Tan et al., 2012). For example, although 'selling TDRs', as a whole, can be considered as a single transaction, it can be further sub-divided into a set of transactions, such as finding a TDR buyer, negotiating a TDR price, and preparing a contract. Likewise, 'finding a TDR buyer', as a transaction that involves 'selling TDRs', may itself be further sub-divided into another set of transactions, such as hiring a broker, sharing information and consulting with policy administrators. Such division can be continued. In line with Tan et al. (2012), this paper decomposes the process of designing and implementing TDR programmes, as far as required, in order to address the research questions at hand.

Table 2: Activities/transactions in designing and implementing TDR programmes and their related transaction costs

Stages	*Category of Activities*	*Examples of transactions creating transaction costs*	*Main Parties involved*
Policy Design	Agenda Setting and Policy Selection	Identifying issues and problems Proposing policy choices Evaluating alternative solutions Calling for public meetings, hearings and votes Selecting the preferred policy	Planners, landowners and developers
	Policy Design and Preparation	Specifying policy goals and objectives Designating preservation (sending) and development (receiving) areas Allocating TDR credits and ordinance for sending and receiving areas Receiving public input Enactment of enabling legislation Modifying existing zoning ordinance and downzoning if required	Planners, landowners, developers, and legislature
	Institutional Arrangement	Hiring and/or training staff Purchasing required equipment Designing the administration process and documents Public TDR educational programmes and workshops	Planners and policy administrators
Policy Implementation	Support and Administration	Consulting with TDR sellers and buyers Reviewing preservation and development applications Determining eligibility and availability of TDRs in sending sites Determining applicable number of TDRs in development projects Maintaining a list of potential TDR sellers and buyers	Policy administrators
	TDR Creation	Hiring a land-use attorney Preparing title report Preparing land survey Applying for TDR certificate	Landowners and developers
	Contracting	Finding a TDR seller or buyer Consulting with policy administrators, land-use attorneys, and brokers Hiring a broker and paying a brokerage commission Negotiating a TDR price Preparing a contract Payment	Landowners and developers
	TDR Retirement	Recording the contract in land record Applying the purchased TDRs in development project Recording the contract, covenant, and other transfer documents	Developers and Policy administrators
	Policy Evaluation	Evaluating the effectiveness of policy Monitoring the TDR market, and balance of TDR supply and demand Calling for public meetings and receiving public input Revising the policy design and institutional arrangement	Planners, landowners, and developers

5.1. Transaction Costs Involved in TDR Policy Design

5.1.1. Agenda Setting and Policy Selection

Similar to most planning policies, the TDR design usually starts with agenda-setting. This activity involves identifying potential issues and problems (Kingdon, 2003). Then, in order to select the best solution to address the identified problems, different policy approaches will be proposed and evaluated. The activities of agenda-setting and policy selection in policy design require detailed information concerning the problems and alternative policy choices. These activities might be initiated and conducted with either a top-down approach or a bottom-up approach. Among the TDR case studies, the Calvert County TDR programme has been an example of the latter approach whereby, the TDR programme was suggested by the farming community, while the Montgomery County TDR programme was initiated based on the former approach, with the programme proposed by the planners. In Calvert County, a committee of farmers was established to find alternative farmland-preservation tools for the county in 1976. The committee held several meetings with the farmers, landowners, and other stakeholders. One of the interviewed committee members stated that *"we started collecting information and looked at the options, [such as] zoning, easement, scenic easement, TDR, and all these different techniques… and finally we convened a meeting of everybody who showed up in a high school cafeteria..., and asked everybody:- which technique do you prefer? 75% of the hands said let's try the TDR."* This bottom-up approach decreased the transaction costs of agenda-setting and policy selection activities in the Calvert TDR programme, by increasing the credibility of the programme itself, and promoting trust among parties involved.

Unlike Calvert County, the TDR programme in Montgomery County was suggested by the planners and accompanied with large-scale downzoning. The TDR programme and downzoning were executed as twin tools to preserve farmlands in Montgomery County, where the TDR programme was designed as a compensation mechanism for landowners negatively-affected by downzoning. Whilst the TDR programme was effectively operationalised, comparatively, significant resistance was encountered. One of the local authorities in Montgomery County highlighted this stating, *"the Montgomery TDR programme has faced with* (sic) *a lot of resistance..., even now after more than thirty years."* By increasing the time and effort that had to be put in lobbying and negotiating with the stakeholders, this resistance increased the transaction costs right from the initial agenda-setting and policy selection activities in the Montgomery TDR programme. Apart from the top-down approach, downzoning is reported to be one of the main causes of such a resistance from a TCE perspective. While downzoning is considered as one of the factors affecting TDR success (Machemer & Kaplowitz, 2002; Pruetz & Standridge, 2008), in its execution, it significantly increases the transaction costs of designing and implementing TDR programmes. In summary, it was found that research and data collection, the analysis associated with defining the problem, lobbying, public participation costs, and the policy selection approach, were the main sources of transaction costs in the agenda-setting and policy selection activities of the TDR policy design process. The distribution of transaction costs largely depended on the policy selection approach; under a top-down approach, such costs are incurred mainly by public parties whereas, in a bottom-up approach, they are distributed more equally among the stakeholders, both public (planners and policy administrators) and private parties, who voluntarily participated in the activities.

5.1.2. Policy Design and Preparation

After selecting the preferred policy, it needs to be designed and prepared for implementation. The design and preparation of TDR programmes are associated with various activities, as outlined in Table 2. The first activity, specifying policy objectives, requires data collection and also specific knowledge which may create human-capital specificity, as a type of transaction cost. Nonetheless, we did not find evidence that such transaction costs are substantial. Among these activities, the designation of preservation and development areas, and allocation of TDR credits for them, however, involve lengthy negotiations and lobbying that generate considerable transaction costs. For example, one interviewee involved in designing the Montgomery TDR programme stated *"we had to hold several meetings to agree on the sending and receiving areas."* While all interviewees mentioned that they believe there is a need to preserve farmland in their counties, reaching a consensus concerning the location of development areas, where they can receive additional densities, is more complex. This is especially because it can cause a NIMBY[1] reaction, such that, even though the residents support the general idea, they might oppose the designation of their own neighbourhoods for receiving areas.

To avoid legal challenges, there is the additional complication that enabling legislation may be required for TDR programmes (Machemer & Kaplowitz, 2002) and this may be associated with different processes, depending on the type of local government. The counties in the state of Maryland have three types of government, including commissioner, charter, and code home-rule. Calvert and St. Mary's Counties are run by Commissioners. Montgomery and Charles Counties operate under the charter form of government and code home-rule, respectively (Maryland Association of Counties, 2016). Calvert and St. Mary's Counties were required to go through the state legislation process in order

1. Not In My Back Yard

to enact enabling legislation for the TDR programmes. However, the process of enactment of enabling legislation for establishing the TDR programmes involved less complexity in Montgomery and Charles Counties, where the types of government allow for more local autonomy. Thus, the form of local government can have a considerable influence on the magnitude of transaction costs of TDR policy design.

5.1.3. Institutional Arrangement

Before implementing a planning policy, the institutional arrangements for policy need to be designed and/or adapted. The institutional arrangements of the TDR programmes are partially designed through specifying the sending and receiving areas and allocating TDR credits for them. But such arrangements are also associated with hiring and/or training staff, purchasing required equipment, and designing the administration process and documents. Prior to implementation, the TDR programmes need the designated staff or policy administrators to manage the programme, as well as the design of administration process and its related documents. The interviews with policy administrators highlighted that the expertise required to perform the TDR programmes are similar to the skills needed to administer other preservation programmes. Therefore, the counties normally assigned the duties concerning TDR administration to their existing employees and in-house staff. For example, one of the policy administrators in Charles County stated *"I was already under contract to do other duties for the county... [Regarding the TDR administration] I didn't have any special training. I just kind of grew up through the process, so it was on-the-job training."* Therefore, it seems that the counties did not incur considerable transaction costs regarding the training of staff for administering the TDR programmes.

The counties usually assign two people to run the TDR programmes; one person responsible for the sending areas (or the supply-side of TDR market) and another person responsible for the receiving areas (the demand-side of market). Consulting with TDR sellers, reviewing TDR applications, and certifying TDRs are the duties of the former administrator, whereas consulting with developers and allocating extra densities in receiving areas, based on purchased TDRs, are responsibilities of the latter. These two people could be working within the same county department, which is the case in all counties. In Montgomery County, however, the Agricultural Services Division of Department of Economic Development is mainly responsible for the sending side, while the Planning Department is responsible for the receiving side of the programme. Separation of the tasks between different departments makes administration process and information collection more time-consuming, compared to other counties, and consequently, increases transaction costs.

In terms of the administration documents, four types of documents are developed for TDR transactions, including the TDR certificate, easement (or covenant), deed of transfer, and TDR sale contract. TDR certificates vary from comprising only serial numbers, in the case of Montgomery County, to being an official document issued by the county, in the cases of Charles and St. Mary's Counties. Both TDR easements/covenants and deed of transfer need to be approved by the county, whereas a TDR sale contract is a private sale document between sellers and buyers. All of the TDR programmes use standard template documents for the TDR easements/covenants and deed of transfer, which can be found on the counties' websites. This attribute of TDR administration decreases transaction costs through making the institutional knowledge gained from one TDR transaction easily transferable to other transactions. Finally, local authorities can hold some public TDR educational programmes/workshops. While such activities generate considerable transaction costs for planners in the policy design stage, they reduce the transaction costs of policy implementation for all parties

involved by promoting public awareness, building trust among parties, and decreasing information collection costs.

5.2. Transaction Costs Involved in TDR Policy Implementation

5.2.1. Support and Administration

During the implementation of TDR programmes, the local authorities provide potential TDR buyers/sellers with relevant information and administrative support. In this stage, the policy administrators are associated with different transactions/activities that generate transaction costs, as presented in Table 2. The process of participation in the TDR programmes for landowners and developers normally begins with initial consultations. As one of the policy administrators in St. Mary's County pointed out, *"the first activity, usually, is an initial consultation that can be a phone call or an office meeting."* In such consultations, the administrators may clarify the TDR administration process, provide a list of people willing to sell/buy TDRs, suggest some land-use attorneys and brokers, and answer any other queries landowners/developers might have. The policy administrators normally provide a checklist of activities required. All interviewed policy administrators believed that, because of the market-based nature of TDR programmes, the administration of them has been more straightforward, and less time-consuming and complicated, in comparison to the other preservation policy instruments, such as PDR[2] and easement programmes. For example, while a PDR programme requires the local authorities to conduct the 'time-consuming process of valuation' for the county to directly buy development rights from the landowners, in TDR programmes, the prices are set by the private market and without direct government interventions. Also, since PDR easements are more restrictive than TDR ones, they require more frequent and time-consuming monitoring and inspection. Thus, the market-based approach of TDR programmes decreases the transaction costs of policy implementation for the policy administrators.

The time and effort that has to be put into reviewing preservation/development applications depends on the policy design and administration process. Regarding the preservation applications, the policy administrators need to determine the eligibility and availability of TDRs in sending areas. Calvert, Montgomery, and St. Mary's Counties have simplified the administration process by specifying the number of acres required to create a single TDR. The landowners in these counties can create a single TDR per one, five, and three acres, respectively, from the properties located in the sending areas. In Charles County the number of eligible TDRs of lands in sending areas is based on soil, size, and location criteria. By increasing uncertainties, administration costs, and information collection costs, this regulation increases transaction costs of both policy administrators and landowners in Charles County, compared to other case studies. Determining applicable number of TDRs in development projects will be discussed in the TDR retirement section.

5.2.2. TDR Creation

The creation of TDRs is the first step for those landowners interested in participating in the TDR programme, and selling the TDRs of their properties. TDR creation refers to the process of certifying TDRs extracted from a sending site and preparing them for transfer and change of ownership. During

2. Purchase of Development Rights

the process required to create TDRs, landowners, and sometimes developers, are involved with some transactions, such as hiring a land-use attorney, preparing a title report, preparing a land survey, and applying for TDR certificates. As part of a TDR application, the counties require a title report, and sometimes a land survey. A title report shows the history of a property in terms of its ownerships, easements, mortgages, and other rights and regulations concerning the property. A land survey refers to the measurement and mapping of a property in terms of its acreage, location, and boundaries. Preparation of these documents requires hiring a land-use attorney and a land surveyor. The land-use attorney is hired directly by the landowner. The land surveyor is hired either by the landowner or on their behalf by the land-use attorney, as part of their contract. The costs of preparing title reports and land surveys vary but are normally within the range of $500-$1500 for the title report and $10,000-$15,000 for the land survey[3]. These costs are considered as the main transaction costs in the process of TDR creation.

Some landowners and developers questioned the necessity of the land survey as a requirement for TDR creation, given that it creates considerable transaction costs. For example, one landowner in Montgomery County argued: *"I think [preparing] a survey is not necessary. You know the acreage of the entire county and if this parcel is 5 acres bigger than it supposed to be, somebody's parcel is around 5 acres smaller. So overall it'll all average itself out eventually."* Although such costs are normally incurred by the landowners, when there are high demands for TDRs, the TDR sellers have higher bargaining power in negotiations with buyers over TDR prices and their associated costs. Depending on market conditions, and the agreement between buyers and sellers, these costs can be incurred by either or both parties. One of the developers in St. Mary's County pointed out that *"even though the landowner incurs those costs, as a developer, obviously I'm going to pay more for the TDRs, because the landowner had to pay those expenses... costs get passed along to the end user."* In summary, the transaction costs of TDR-creation transactions can be significant and are mainly incurred by the landowners and developers involved in the TDR transactions.

5.2.3. Contracting

After creating TDRs, landowners are required to find a buyer for their TDRs and complete the transfer. The important transactions here are finding a TDR seller or buyer, collecting information from policy administrators and intermediaries, hiring a broker and paying a brokerage commission, negotiating a TDR price, preparing a contract, and payment. One of the main sources of transaction costs for the sellers of TDRs is uncertainty surrounding how to find a buyer for their TDRs. All of the counties provide some information, available for TDR buyers, about potential TDR sellers. In Charles County, there is an online list of people who have TDRs certified. Other counties maintain a list of individuals, available upon request, who have TDRs for sale. However, no listing of potential buyers is made available. Thus, it is much easier to find a TDR seller than a buyer. There is no source to find the TDR buyers, other than 'word of mouth' and/or the use of intermediaries such as brokers and land-use attorneys. One of the farmers in Montgomery County, pointed out *"I think there could be a better platform, like an online website, where it's not only word of mouth. Not just you know a guy, he knows a guy. Some kind of database platform set up where developers can go in there and you can look at it. They can say I'm looking for this amount of TDRs, who in the county has them."* This uncertainty over finding a buyer for TDRs increases overall transaction costs of TDR sellers, in comparison to the costs incurred by the TDR buyers.

3. As of June 2016

Negotiations over TDR prices are associated with high levels of uncertainty, thereby increasing transaction costs for the parties involved in the transaction. Information asymmetries, opportunism, and substantial TDR-price fluctuations are the main sources of uncertainties in the TDR transactions. Because of their past experiences and personal connections, developers usually have better access to relevant data and information concerning the TDR prices, compared to farmers and landowners. Such information asymmetries provide potential for rent-seeking and opportunistic behaviours. As the TDR prices are mainly driven by the housing and development market, their fluctuations have been significant in the TDR case studies during the years of their initiation, with the exception of Calvert County. For example, the TDR price in Charles County was $10,000 per TDR in 2005, while, one year later in 2006, the price was as high as $20,000 per TDR. Again, mainly because of economic and financial crisis of 2008, the price of $19,500 per TDR in that year dramatically dropped and traded for $5,000 per TDR in 2009. Finally, the parties involved in TDR transactions normally use some 'boilerplate' templates to prepare such contracts. Thus, preparing a contract between sellers and buyers of TDRs is a straightforward activity which is not associated with considerable transaction costs.

5.2.4. TDR Retirement

The last step in the lifecycle of TDRs is their retirement, which refers to the process of landing (i.e. permanently assigning) them in areas designated for development. When TDRs are created and transferred to developers, they can use them as allowances for extra densities in their development projects located in receiving areas, subject to gaining the approval of planners. In Calvert, Charles, and St. Mary's Counties, the use of purchased TDRs in the receiving areas is 'by right', which means the developers do not have to negotiate over the use of density with TDRs and can build at the level specified in the zoning ordinance. In Montgomery County, the density is subject to negotiation with the county planning administration and/or public hearings on development, even with TDRs being specified in the zoning ordinance. Developers in this county are faced with uncertainty over the development density outcomes, notwithstanding their TDR purchase. This attribute of Montgomery County increases transaction costs of the developers through an uncertain and lengthy development review process. This difference between Montgomery County and other case studies lies behind their different locations, scales, and, consequently, approaches toward future development. An important contrasting characteristic of the other three counties is that they are mainly rural, and tend to have a positive outlook towards development. Whereas Montgomery County, having more urbanised areas with a population approximately three times more than all the other three counties collectively, has stricter development policies.

5.2.5. Policy Evaluation

Evaluation is an essential part of the policy design and implementation process. All counties have conducted a number of ongoing evaluations after the initiation of programmes. These aim to assess the effectiveness of the programme, and to monitor the TDR market, in general, and the balance of TDR supply and demand, in particular and have led to some major changes in the design and implementation of all TDR case-study programmes. For example, St. Mary's County programme evaluations resulted in three major changes in 1999, 2002, and 2006. The county amended the zoning ordinance in order to increase the demand for TDRs and simplified the administration process by removing some TDR application requirements, such as the land survey. Transaction costs of TDR evaluation activities are comparable with those concerning the TDR policy design, discussed above. Such activities require

significant information collection and negotiations, which are the main sources of transaction costs in TDR evaluation. In the case of St. Mary's County TDR programme, a taskforce that formed to evaluate the programme held several meetings over two years. Similar to the TDR policy design activities, the distribution of such costs depends on the policy evaluation and policy change approach; whether it uses a bottom-up or a top-down approach. Table 3 outlines the key findings concerning each category of activities in the process of designing and implementing TDR case-study programmes and their related transaction costs.

Table 3: Key findings concerning each TDR programme and types of influence on transaction costs

Stages	***Category of Activities***	***Key findings by county and types of influence on transaction costs***			
		Calvert	Montgomery	St. Mary's	Charles
Policy Design	Agenda Setting and Policy Selection	Bottom-up approach (-)	Top-down approach (+)	Top-down approach (+)	Top-down approach (+)
	Policy Design and Preparation	No downzoning at the outset of programme (-)	Downzoning (+)	Downzoning (+)	No downzoning (-)
	Institutional Arrangement	Single county department involved (-)	Multiple county departments involved (+)	Single county department involved (-)	Single county department involved (-)
Policy Implementation	Support and Administration and TDR Creation	TDRs availability only based on land size (-)	TDRs availability only based on land size (-)	TDRs availability only based on land size (-)	TDRs availability based on soil, size, and location criteria (+)
	Contracting	Relatively stable TDR-prices (-)	Substantial TDR-price fluctuations (+)	Substantial TDR-price fluctuations (+)	Substantial TDR-price fluctuations (+)
	TDR Retirement	Use of purchased TDRs by-right (-)	Use of purchased TDRs not by-right (+)	Use of purchased TDRs by-right (-)	Use of purchased TDRs by-right (-)

(+) upward influence on transaction costs, (-) downward influence on transaction costs, comparatively

6. Summary and Conclusions

Managing the externalities of development is critical in developed and developing countries. In analysing policy instruments, policy analysts often use efficiency and equity as evaluation criteria noting the importance of minimising the costs of environmental preservation and ensuring the benefits of development are shared more equitably. Presented by new institutional economists, transaction costs are one of the influencing factors on both the efficiency and equity of policy instruments. Positive transaction costs reduce the efficiency of a policy and as such costs are usually distributed unequally among different private and public parties involved, they can have a considerable impact on the equity of any policy. Despite their introduction into the planning literature, transaction costs have yet to be fully examined in terms of the process of designing and implementing planning policy instruments. Through analysing four TDR case-study programmes, this article contributes to the planning literature by presenting a way that policy-related transaction costs can be analysed systematically through a framework informed by TCE. Importantly, this paper argues that gaining a better understanding of when transaction costs arise, and who bears these costs, enables planners to design and implement policy instruments in a more efficient and equitable manner. This has the potential to aid policy design and implementation; also enabling the transfer of policy design lessons to other developed and developing countries adopting such programmes.

The design and implementation of the TDR programmes consist of different activities/transactions that generate transaction costs (as we outline in Table 2). The process of designing TDR programmes involves three categories of activities, including agenda-setting and policy selection, policy design and preparation, and institutional arrangement. Among the identified

transactions of TDR policy design activities, two transactions are associated with notable transaction costs; first, calling for public meetings, hearings and votes in the agenda-setting and policy selection; second, modifying existing zoning ordinance along with downzoning. Although public involvement and participation increases the transaction costs of the activities concerning TDR policy design, it can decrease such costs in the process of TDR implementation through increasing the credibility of a programme, raising public awareness, and building trust among parties involved. On the other hand, downzoning is politically unpopular, whereby it generates resistance against the design and implementation of the TDR programmes.

The TDR-implementation stage is classified into five categories of activities, including support and administration, TDR creation, contracting, TDR retirement, and policy evaluation. While the transaction costs of activities associated with support and administration and policy evaluation are mainly incurred by public parties, the transaction costs of TDR creation, contracting, and TDR retirement, are largely incurred by private parties. The main sources of transaction costs in the TDR-creation activities are fulfilling the TDR administration requirements, such as preparing the title report and land survey. Uncertainties surrounding TDR prices, and finding TDR buyers, create substantial transaction costs in the activities associated with contracting. Finally, subsequent to purchasing TDRs, the main source of transaction costs in the TDR retirement stage results from the need for further negotiation with the county, and associated public hearings, for obtaining extra density to be used in the development projects. The use of purchased TDRs 'by right' decreases the transaction costs of developers.

In terms of the distribution of transaction costs, the results of this study show that such costs vary across time, as well as among parties involved in different stages. While public parties associate with high transaction costs in the TDR policy-design stage, their costs are not reported to be substantial in the TDR policy-implementation stage. Due to the market-based nature of TDR programmes, transaction costs arising from their implementation are largely incurred by private parties, rather than public parties. In order to find a buyer/seller for TDRs, and to understand what the current TDR sale price is, the TDR sellers/buyers are heavily reliant on their personal relationships. This relational form of transaction can have an upward effect on transaction costs by increasing uncertainties and information-collection costs. However, such transaction costs incurred by developers are reported to be fewer in comparison to those of landowners because they usually have better access to relevant information through personal connections and past experiences. Along with timing and distributional aspects of transaction costs in the design and implementation of policy instruments, measuring the magnitude of such costs can be of significant importance. While it was beyond the objectives of the current paper, we suggest that such measurement would be a fruitful and helpful area for further research.

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