



Analysis

Influences of transaction costs in environmental policy

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ABSTRACT

There is a growing literature reporting the extent of transaction costs for environmental policies. However understanding why transaction costs occur and why they are small or large is also important for efficient policy selection and evaluation. Following an analysis of the organisational economics literature and reports of the extent of transaction costs for a number of environmental policies, three key influences to transaction costs in environmental policies are identified. These are the following: 1) the characteristics of the transaction for the environmental good; 2) the nature of the transactors; and 3) the current institutional environment and arrangements. These affect transaction costs to the government and all other parties influenced by a policy. Transaction costs occur due to actions of information collection and policy design, policy enactment and establishment, implementation and contracting, administration and monitoring, and enforcement. An interrogation of transaction cost influences reveals that: 1) the influence varies between parties and is affected by the actions and interactions of and between all parties to a policy; 2) how transaction costs are experienced varies across time; and 3) who experiences transaction costs depends on the policy itself. Future policy selection and refinement will benefit from empirical analysis of the causes of transaction costs.

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1. Introduction

Land use decisions by individual landholders respond to a variety of incentives (Wills, 1997). Markets are the most widely used mechanism for signalling incentives to individuals in western society. Land owners are rewarded for land uses that produce marketable outputs but not for the other socially valued products such as the maintenance or enhancement of public goods (for example, environmental quality). When the market fails to supply a good to the level that is socially desirable, market failure is said to have occurred. It is at this point that intervention by government or non-government organisations to ensure the supply of public goods may be justified (Murtough et al., 2002). Intervention can be through a number of alternative policy instrument types: market based (including public purchase such as a competitive tender or public facilitation of a private market such as a cap and trade scheme), regulatory, or a combination which also draws on partnerships and social networks (Buitelaar, 2007). Each individual or package of policy instruments

(hereon referred to as policies) provides a different level, mix and distribution of benefits and costs which occur over varying spatial and temporal scales.

A caveat on any form of intervention is that it must be *efficient*; that the benefits are greater than the costs. Critical to calculations of net benefit is the inclusion of the cost of the intervention and within this, the inclusion of the transaction costs; the cost of resources to define, establish, maintain and exchange property rights (McCann et al., 2005).

The literature defining transaction costs is extensive (e.g. Cheung, 1969; Williamson, 1973, 1981, 1998; Dahlman, 1979; Barzel, 1985; Stiglitz, 1986; North, 1990; Allen, 1991). There is also an extensive literature that sets out frameworks for measuring transaction costs broadly (Dahlman, 1979; Stiglitz, 1986) and for measuring the transaction costs of environmental policies explicitly (Colby, 1990; Howitt, 1994; Thompson, 1999) with the most comprehensive measurement framework provided by McCann et al. (2005). There is also a small but growing body of literature that report *ex post* measures of transaction costs of environmental policy (McCann and Easter, 2000; Howitt, 1994; Falconer et al., 2001; Falconer, 2000; Falconer and Saunders, 2002; Vatn et al., 2002; Rorstad et al., 2007; Kuperan et al., 2008; Mettepenningen et al., 2009).

What is missing in the current literature is an understanding and rigorous analysis of what influences transaction costs to all parties engaged in an environmental policy. That is, what influences transaction costs throughout environmental policy development,

Abbreviations: AES, Agri-Environment Schemes; CSIRO, Commonwealth Scientific Industrial Research Organisation; OECD, Organisation for Economic Co-operation and Development.

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implementation and administration and what influences different types of transaction costs to be large or small and distributed across different parties. Without this information, policy decision makers may be limited in their ability to make informed *ex ante* decisions around policy selection, design and implementation frameworks for their problem context. Furthermore, efforts to refine the design of a policy for efficiency gains *ex post* are unguided (Falconer and Whitby, 1999; Falconer et al., 2001; McCann et al., 2005).

The objective of this paper is to address this gap in the literature for the influences of transaction costs.³ This is done through a review and synthesis of the current transaction cost literature. Two main sources of information are utilised. The first is organisational economics where transaction cost influences are discussed in the context of selecting a governance structure for production coordination. The second is a compilation of studies that have measured the transaction costs of various environmental policy instruments. By drawing this literature together, a further contribution of this paper is highlighting current knowledge gaps and areas for future research.

The paper is structured as follows. In Section 2 a background to the concept of transaction costs related to the supply of environmental goods, and how transaction costs occur in the creation and use of an environmental policy are provided. A discussion of measures of transaction costs of environmental policy highlighting the gaps in this current literature is also undertaken in Section 2. Section 3 contains the review of the current literature on what influences transaction costs. Section 3 also includes a discussion on how factors influence the transaction costs of both the public and private parties to the environmental policy. Section 3 concludes with a summary of influences of transaction costs for environmental policy. Conclusions, as well as discussion about further research, are provided in Section 4.

2. Background

2.1. What are transaction costs?

Transaction costs are the cost of resources used to define, establish, maintain and transfer property rights (McCann et al., 2005). In relation to the transfer of a product, transaction costs have been defined as all the costs that are not directly related to the production of that product (Lai, 1997; Nilsson and Sundqvist, 2007). Transaction costs arise because of information uncertainty and as a result of the actions that transactors must take to manage for this uncertainty. Transaction cost generating actions include searching for contract partners, gaining knowledge of materials and production, negotiating and concluding contracts and monitoring and enforcing contracts over time (Bromley, 1991; Kasper, 1998). Transaction costs typically occur as goods and services, travel costs, labour and time expended in a transaction. Matthews (1986) describes transaction costs as the costs of arranging a contract *ex ante* and monitoring and enforcing that contract *ex post*.

Institutions, the rules of behaviour which structure the economic, social and political behaviour of people, reduce uncertainty surrounding interactions and thereby reduce transaction costs (North, 1990). Institutions may be informal such as conventions, habits and social norms or formal and based on legal character such as contracts (North, 1990). Williamson (1998) describes these two levels of institution as the institutional environment and arrangements. The institutional environment is the legal, social and political rules that determine the context in which economic activity takes place while institutional arrangements are the governance structures which structure transactor interaction (markets, regulation and hierarchies)

(Williamson, 1990, 1998). Economists tend to take the institutional environment as given (Williamson, 1998). Property rights are a “subset of (formal) institutions for regulation of behaviour and social interactions with respect to objects of value” Challen (2000:15). Property rights reduce uncertainty and hence transaction costs in interactions between agents (Furubotn and Richter, 2000: 2–3). The definition and discussion of property rights vary across disciplines. Barzel (1997) refers to the economic and legal definitions of property rights. The former is a right which enables the right holder to enjoy a piece of property or to consume a good or services from an asset directly or indirectly through exchange. The latter is the protection of the former from the state which is essential for individuals to realise the economic benefits from assets (through enforcement). Others (Commons, 1968; Bromley, 1989, 1991; Schalger and Ostrom, 1992) note that the outcome of the property right allocation depends on the specifications or the rules and entitlements that are related to the use of the right. Schalger and Ostrom (1992) highlight that the benefit stream accruing to a right holder depends on the package of access, withdraw, management, exclusion and alienation rights held by authorised users, claimants, proprietors and owners of a good. The alienation component of the property right bundle enables complete right ownership and then owners of rights to benefit from actual exchange of the right consistent with property rights definitions such as that of Barzel.⁴

2.2. Transaction costs and environmental goods

Regardless of which rights are held in the ‘bundle’, the extent of the benefit stream associated with this bundle is affected by how clearly the rules, responsibilities and entitlements surrounding these rights are defined. For an authorised user with only access and withdraw rights, benefit is eroded if there are high costs of collecting information about when, where and how access and withdraw can take place. For a right owner, the benefits of exchange are eroded if there are high costs to define the good to be exchanged or there are high costs for buyers and sellers to find each other. For many environmental goods the bundles of rights surrounding management, access and exchange are either non-existent or not well defined, this is particularly the case surrounding the excludability component of the right. Goods for which rights and duties, particularly around excludability, are not well specified are considered to be some form of public goods. The undersupply of these and/or the fact that there are uncompensated costs for damage to these is discussed in terms of externalities.

A pure public good is a good that is both non-exclusive and non-rival (Ostrom and Ostrom, 1999). Non-exclusive means that the exclusion part of the right bundle is not well specified and therefore the costs incurred to prevent use by others far outweighs any gains from this action. Non-rival means that consumption benefits enjoyed by one person do not impinge on the benefits enjoyed by another and thereby do not impact on another's willingness or ability to consume (Weimer and Vining, 1992; Grafton et al., 2004). Non rivalry also occurs for production whereby the marginal cost of the provision of a good to an additional consumer is zero (Demsetz, 1970). Most public goods are not pure public goods, the OECD (2001) classifies pure and impure public goods into five categories depending on their degree of excludability and rivalry. Regardless of the purity of the public good, if it is too costly to exclude beneficiaries from the supply of a good it is also impossible to extract a charge for the provision of this good. As a result there are weak financial incentives for potential suppliers to provide the good above the level of private benefit. Poor definition of

³ We note that understanding why transaction costs are distributed across different parties to a policy is also significant to policy design and refinement. This issue is touched on in this paper but is not addressed in detail.

⁴ This is not suggesting that this is the only way that a right holder benefits from a bundle of rights. See Schalger and Ostrom (1992) for an in depth discussion of the implications for benefit of different bundles of rights.

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