試就"Resources and transaction costs: how property rights economics furthers the resource-based view"一文回答下列問題：（請以中文作答否則不予計分，共計50分）

1. 本文如何從property right 的角度看待resource?（15分）

2. "TRANSACTION COSTS" 與 "value creation and appropriation" 及 "sustained competitive advantage" 各有何關連？請分別敘述。（20分）

3. 本文之貢獻何在?（15分）

RESOURCES AND TRANSACTION COSTS: HOW PROPERTY RIGHTS ECONOMICS FURTHERS THE RESOURCE-BASED VIEW

KIRSTEN FOSS[1]* and NICOLAI J. FOSS[2]

[1] Copenhagen Business School, Frederiksberg, Denmark
[2] Copenhagen Business School, Copenhagen, Denmark; and Norwegian School of Economics and Business Administration, Bergen, Norway

Property rights economics furthers the resource-based view of strategic management in a number of ways. First, resources are conceptualized as being composed of multiple attributes for which property rights may be held. Second, a resource owner's ability to create, appropriate, and sustain value from resources depends on the property rights that he or she holds and on the transaction costs of exchanging, defining, and protecting them. While transaction costs are a major source of value dissipation, reducing such dissipation may create value. Implications for the RBV analysis of sustained competitive advantage are derived. Copyright © 2005 John Wiley & Sons, Ltd.

INTRODUCTION

According to Nobel Prize winner, Ronald Coase (1992: 716):

> [b]usinessmen in deciding on their ways of doing business and on what to produce have to take into account transaction costs ... In fact, a large part of what we think of as economic activity is designed to accomplish what high transaction costs would otherwise prevent.

For example, consider the DeBeers diamond cartel and the practice they have adopted for organizing sales. A customer informs DeBeers of her wishes for a specific number and quality of stones. DeBeers then offers the customer a packet of stones—a 'sight'—that roughly corresponds to the customer's wishes. The sight is offered on a 'take-it-or-leave-us' basis, where refusal to take the sight means that DeBeers refuses to deal with the customer any more. The price is calculated based on the overall characteristics of the stones and no negotiation over the price is allowed.

Does this strategy reflect raw market power on the part of a player that controls 80 percent of the world market for raw diamonds? Property rights economists have argued that it does not (Barzel, 1982; Kenney and Klein, 1983). Rather, this is a practice that maximizes created value in firm–customer relations by reducing the costs customers otherwise would have expended on sorting and negotiating, and it arguably exists for this reason (it would be superfluous in a zero transaction cost world). DeBeers sorts the product, but only in a coarse manner. The 'take-it-or-leave-us' practice and the non-negotiable price mean that negotiation costs are effectively eliminated. As only minimum resources (i.e., transaction costs) are spent on sorting and negotiating, DeBeers' practice maximizes the total created value that the parties to the transaction can split. Similar practices can be observed in many other industries, such as the prepackaging of fruit and vegetables in grocery stores, or block booking in the movie industry (Barzel, 1982, 1997; Kenney and Klein, 1983).

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Strategic management research has paid little attention to transaction cost-reducing practices. However, their theoretical explanation has important implications for strategic management and, in particular, the resource-based view (the 'RBV') (Barney, 1991; Peteraf, 1993). First, transaction costs and value *creation* appear to be linked. Sorting costs, which are part of transaction costs, reduce created value in an exchange. However, certain sales practices may reduce transaction costs, increasing created value. In other words, they 'accomplish what high transaction costs would otherwise prevent.' Second, transaction costs and value *appropriation* appear to be linked. Suppose DeBeers posts prices that reflect the mean quality of the diamonds in a given sight. If DeBeers then allows customers to sort between the diamonds in a sight, customers will only pick high-quality stones. DeBeers' sales practice raises customers' (transaction) costs of sorting to infinity, allowing DeBeers to maximize the share of created value that it can appropriate from its resources.[1]

This paper explores the relations between transaction costs, and value creation and appropriation, relating the discussion to the RBV. In the process, we proffer concepts that are new to strategic management. Specially, we focus our arguments using the *economics of property rights* (EPR) (e.g., Coase, 1988; Alchian, 1977; Demsetz, 1988; Eggertson, 1990; Barzel, 1997). Property rights to resource attributes consist of the rights to use, consume, obtain income from, and alienate these attributes. Property rights are important to strategy because a resource owner's ability to create, appropriate, and sustain value from resources partly depends on the property rights that he or she holds and how well they are protected. In turn, transaction costs—the costs of exchanging, protecting, and capturing property rights—are important to strategy because they influence the value that a resource owner can appropriate. This conceptualization unifies the theoretical constructs of resources, property rights, transaction costs, value creation and appropriation.

Our contribution to clarifying the micro-foundations of the RBV is related to Lippman and Rumelt's (2003a, 2003b) recent attempt to construct a cooperative game theory foundation for the RBV. They point out that prices and, therefore,

the share of created value that is appropriated by a particular resource owner are bargaining outcomes, and they perceive value creation as mainly driven by search for new uses of resources. We broadly agree with this view. However, unlike Lippman and Rumelt we stress the crucial importance of transaction costs for value creation and appropriation. Our explicit focus on transaction costs helps explain how value can be created by reducing transaction costs and brings attention to ways of appropriating created value beyond bargaining. The sales strategy of DeBeers illustrates a means of increasing the value appropriated from customers. DeBeers raises the value it can impute to its bundle of resources solely by reducing overall transaction costs—without altering its bargaining power.

The design of the paper is as follows. We begin by applying the basic tenets of EPR to the notion of a resource. This leads to an understanding of resources as bundles of property rights to resource attributes, which in turn provides insight into value creation and value appropriation. The value that a resource owner can create and appropriate depends not only on the use, scarcity, and outside options of the resource (Barney, 1991; Lippman and Rumelt, 2003a), but also on the transaction costs of trading and protecting the property rights to the attributes that make up the resource. Further implications of EPR for the RBV are then developed by first examining value creation and appropriation in a setting where transaction costs are zero (Coase, 1988), and then tracing the implications for value creation and appropriation when transaction costs are added. The questions we address and seek to answer through this exercise are: How do transaction costs influence value creation and appropriation? What insights into opportunities for value creation and appropriation are gained through a focus on transaction costs? We relate EPR to the key RBV model (Barney, 1991; Peteraf, 1993). Finally, avenues for future work are discussed.

REFINING RESOURCE ANALYSIS: PROPERTY RIGHTS AND RESOURCE VALUE

Applying property rights economics to strategic management

The EPR has only been explicitly applied to the strategic management field in a few previous papers (Mahoney, 1992; Foss and Foss, 2000; Kim

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[1] In fact, the sales practice may itself be a valuable resource for DeBeers.

and Mahoney, 2002; Foss, 2003), although property rights notions appear in analyses of the strategic implications of intellectual property issues (i.e., Teece, 1988; Argyres and Liebeskind, 1998; Oxley, 1999). However, EPR goes far beyond issues of intellectual property. We therefore turn to the fundamentals of the EPR, particularly as these relate to resources and resource value.[2]

Units of analysis

The EPR stresses that transactions involve the exchange of property rights rather than the exchange of goods per se (Coase, 1988). Hence, the unit of analysis is the individual property right. Although the units of analysis of EPR and the RBV differ, the EPR view agrees with the RBV position that resources matter for the analysis of sustained competitive advantage. However, the EPR *refines* the RBV understanding of resources, and how they create and appropriate value.

Different definitions of 'resources' are provided in the literature (see Wernerfelt, 1984; Barney, 1991; Grant, 1991). However, they all tend to see resources as 'elementary particles'—irreducible units. Resources are often better thought of as 'molecules' that are composed of bundles of rights to attributes. 'Attributes' consist of the different functionalities and services (Penrose, 1959) that assets can supply. Property rights are held to such attributes (Barzel, 1997) and consist of the right to consume, obtain income from, and alienate these attributes (Alchian, 1977). For example, a hi-fi system can play different kinds of music, with different levels of bass or treble at different volumes. All of these functionalities are attributes over which the owner holds property rights. However, the hi-fi's ability to play extremely loud music may not be realized if the law or neighborhood norms prevent this service. The relevant use rights are then constrained. Strategic assets, such as brand names, may also have multiple attributes, some of which may be similarly constrained. An owner of a brand name can decide in which contexts she wishes to deploy the brand name. However, her use rights may still be constrained, for example, if she is prohibited from using the brand name as a domain name on the Internet. How property rights are constrained by the law, agreements, or norms

influences how much value a resource owner can create and appropriate from the resource.[3]

Resources as bundles of property rights

These examples suggest that it is useful to think of resources as *bundles of property rights to attributes*. The resource is an important aggregation of the unit of analysis (the individual property right), because resources are traded or accumulated more often than individual property rights over attributes. The way in which attributes are bundled in goods often reflects production costs and technical constraints. However, transaction costs also play an important role.[4] Attributes are usually traded in bundles to economize the costs of specifying and trading individual resource attributes (Foss and Foss, 2001). Firms often acquire the entire bundle of property rights to a resource, such as a production facility, to avoid the costs of specifying and trading only those attributes that are of economic interest to the firm. However, such transaction costs hinder the resource owner in realizing the full potential value of the resource, because some attributes that are not used by the current owner are not traded (e.g., production time may be costly to trade). If the relevant transaction costs are somehow reduced so that such attributes can be specified and traded, the resource owner may appropriate more value from the resource.

Thinking of resources in terms of property rights to valued attributes implies that resources are not given, but are the *outcomes* of processes of economizing with transaction costs. Obvious examples are those resources that only exist *because* of transaction costs, such as contracts, and the DeBeers sales practice.[5] Seemingly identical resources may

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[2] Only those aspects that are relevant to the RBV are discussed here. See Eggertson (1990) for a comprehensive presentation.

[3] This adds a property rights dimension to Penrose's (1959) distinction between resources and the services they yield. The services that a firm can derive from its resources (i.e., the fungibility of the resources) are not only constrained by path dependencies, the functionalities of the resource, and managerial imagination (Penrose, 1959), but also by the transaction costs of realizing the economic potential of the property rights and by the way in which those property rights are constrained.

[4] Relevant transaction costs are costs of drafting contracts (i.e., contracts become incomplete), costs of monitoring (which make moral hazard viable), measuring attributes (which induces adverse selection), and costs of protecting against entry and imitation (which reduce property rights to income streams from controlling certain market shares and resources).

[5] For example, whether goods such as copying machines and servicing agreements are sold as a combined good (i.e., a 'tying arrangement') depends on the costs to the seller or lessor of

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be economically different when they are controlled by firms that are not equally capable of protecting the relevant resource attributes. For example, the 'same' kind of employees, employed in different firms with different incentive systems, will engage in different morally hazardous activities. From an economic standpoint, they are different resources and will be paid differently.

Resource value and transaction costs

Another implication of the property rights view of resources is that transaction costs influence the value that a resource owner can create and appropriate. The resource value that an owner can create depends on the bundle of property rights that she holds for the attributes of the resource, the constraints imposed on these property rights, *and* the costs of trading them. The value that a resource owner can appropriate also depends on transaction costs. Value appropriation presupposes that the owner can *exclude* non-owners from using or destroying attributes to which he holds property rights. While the resource owner has the legal right to exclude non-owners from using and obtaining value from his resources, he may still find it too costly to exclude non-owners from *all* possible uses of the resource. In effect, he cedes the relevant rights (Barzel, 1997). Similarly, given costs of protecting property rights over attributes, owners often choose to control the relevant property rights to varying degrees, an aspect reflected in the value that a resource owner can appropriate. For example, in a franchise chain the value of a brand name to the franchisor will be eroded (Dierickx and Cool, 1989) when it is too costly to the franchisor to exclude franchisees from using the name to sell low-quality products.

When resources are conceived of as bundles of property rights, the potential value that a resource owner can create and appropriate does not only depend on supply and demand conditions for the entire bundle of property rights, but also on how this bundle is constrained, the transaction costs involved in realizing the value of individual property rights, and the transaction costs of controlling the property rights to the attributes that constitute the resource. *Attempts to maximize resource value must take such transaction costs into account.*

monitoring the impact of non-standard servicing on the machine (Elzinga and Mills, 2001).

Controlling property rights: The capture and protection of property rights

An important part of transaction costs are the costs of using legal and/or private means of protection. Positive transaction costs imply that most property rights are not fully protected and can be subject to capture efforts (henceforth, 'capture'). By 'capture' we mean resource-consuming activities to appropriate value from other strategizers *without compensating them.*[6] Moral hazard, adverse selection, and hold-up are familiar examples of capture. While capture is different from exchange, it may take place in exchange relations. For example, two parties to a transaction agree on a price for a resource with certain attributes, such as a certain quality level); however, the supplier may deliver a resource of poorer quality. Such moral hazard on the part of the supplier amounts to capturing (some) valued resource attributes from the buyer (Chi, 1994).[7]

Given this definition of capture, 'protection efforts' (henceforth, 'protection') can be defined as the resource-consuming activities that strategizers undertake to reduce other strategizers' incentives to capture property rights. Since capture takes many forms, the notion of protection in EPR goes significantly beyond making and keeping resources costly to imitate or substitute (Teece, 1988; Barney, 1991). In addition to such protection strategies, property rights may be protected by choosing governance structures in order to reduce capture in the form of moral hazard or hold-up (Mahoney, 1992; Chi, 1994; Hart, 1995; Williamson, 1996), by using the legal system, by establishing private orderings (Williamson, 1996), deterring entry (Tirole, 1988), by writing contracts, and by adopting sales strategies to hinder adverse sorting (as in the DeBeers example) (Barzel, 1982; Kenney and Klein, 1983). The RBV mainly considers a subset of these protection activities, namely protecting against imitation, but stands to gain from considering a broader set than it presently does.

To illustrate, consider an insurance company that is the first to market a particular kind of

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[6] Thus, capture creates what economists call 'externalities.'

[7] There is also a dimension of capture to competition. Competitive imitation and substitution, as well as competition in terms of quality, technology, and price, may be seen as capture because these competitive activities reduce the value that a resource owner can appropriate without compensating the owner of that resource (Barzel, 1994; Foss, 2003).

accident insurance concept, which in turn comes heavily into demand. The product can be fully protected from imitation using legal means. Moreover, assume that suppliers and customers can only bargain for a small part of the value created by the new concept. Given all this, the insurance company would seem to implement '... a value creating strategy not simultaneously being implemented by any current or potential competitors and ... these other firms are unable to duplicate the benefits of this strategy' (Barney, 1991: 102). In other words, the company seems to have realized a sustained competitive advantage. However, this may not be the case. The price of insurance contracts cannot perfectly reflect the true accident risks of each individual who takes out insurance due to the transaction costs. Given variation in risks, some customers, namely those with high accident risks, capture value in excess of what they pay for (i.e., 'adverse selection;' Akerlof, 1984). At the limit, all of the rents from the new strategy will be eroded through the value capture/adverse selection of customers.

This example implies that protection of resource value goes beyond keeping resources non-imitable. Resources are not fully protected from value erosion unless they are protected from *all* kinds of capture. In the example, the proper way to protect value would be to segment the customer base. The example further indicates that EPR has implications for value creation, appropriation, and sustained competitive advantage, implications which add to the RBV. In order to explore these implications, we first examine value creation and appropriation in a setting where transaction costs are zero, which is the setting underlying the *Coase theorem* (Coase, 1988). The zero transaction cost setting serves as a useful benchmark, because it represents a state in which maximum value is created. We then explicitly consider transaction costs, and examine their implications for value creation and appropriation relative to the benchmark situation.

RELATING TRANSACTION COSTS TO VALUE CREATION AND APPROPRIATION

The Coase theorem

In short, the Coase theorem states that all value that *can* be created from the exchange and use of an economy's available goods *will*, in fact, be created when transaction costs are absent. The underlying assumptions are that in such a surplus-maximizing equilibrium strategizers have full information,[8] there are no costs of defining and protecting resource property rights, and there are no bargaining costs.

As the costs of exchanging property rights are zero, all property rights to all attributes can be exchanged and are optimally bundled into resources.[9] In this situation, there will still be constraints on the use rights over resources, but these constraints will be defined in a value-maximizing manner. In other words, externalities cause no avoidable loss of value. Given the optimal constraints and costless exchange, resources will be put to their best possible uses. In this benchmark situation, *the maximum value that resources can create will be realized.*

Another way of stating that the cost of exchanging property rights is zero is that the prices for all those resource uses that are realized in the value-maximizing equilibrium emerge immediately from costless bargaining processes. For example, consider a parking space that is located adjacent to a supermarket. Since information and bargaining costs are zero, the supermarket owner will bargain with all users of the parking space so that all property rights to the various attributes of the parking space will be priced. Relevant attributes may be the time, date, and proximity to the supermarket entrance. Different prices for different bundles of property rights for these attributes will likely emerge. Since prices are perfect signals of scarcities, all attributes will be perfectly rationed, so that no queues emerge and reallocating the use rights for the parking space cannot increase created value. However, while the zero transaction cost condition implies that total resource value will be at its maximum, the issue of value appropriation is not directly addressed. For this, further theoretical apparatus, namely bargaining theory (Lippman and Rumelt, 2003a), is required.

As bargaining is costless, the value created by the use of resources is always independent of the value that each individual resource owner appropriates. One may think of parties to transactions

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[8] This is a strong version of the Coase theorem (as in Coase, 1988; and Barzel, 1997).

[9] However, the very notion of a 'resource' becomes somewhat redundant in this extreme, as many exchanges will involve property rights over attributes rather than resources per se.

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(i.e., resource owners) as first agreeing to maximize the value that can be created from their resources, and then splitting this value through bargaining to define each party's share of the created value (Milgrom and Roberts, 1992). Since all promises are enforceable, resource owners will always receive at least their opportunity costs and resource investments will always be covered (Hart, 1995). In other words, *value creation is independent of value appropriation when transaction costs are zero.*

The zero transaction cost setting does not imply long-run, perfect competition, and is therefore compatible with resource owners earning rents. As Coase (1988) notes, rents may be earned when the supply of input resources is not perfectly elastic, independent of whether transaction costs exist or not. As property rights are perfectly protected, these rents are sustainable. However, since bargaining (and forming coalitions) is costless, the owner of a scarce resource is unlikely to appropriate all rents.

While the rudiments of the resource-based view of sustainable competitive advantage (Barney, 1991; Peteraf, 1993) are thus far consistent with the zero transaction cost assumption, this assumption only leaves limited room for understanding the links between resources and sustained competitive advantage. In order to explore these links in detail, the assumption that transaction costs are zero must be abandoned.

The introduction of transaction costs brings both bad and good news to strategizers. The bad news is that in a positive transaction cost world realizing the full potential of all resources is impossible with respect to value creation. Moreover, resource value can be eroded in numerous ways by the creative attempts of other strategizers to capture value. The good news is that the presence of transaction costs generates sources of value creation and appropriation (i.e., strategic opportunities) that would not exist if the transaction costs were zero.

Value dissipation and value erosion: Bad news for strategizers

In a positive transaction cost world, some *value dissipation* is strictly unavoidable. Dissipation results because protecting property rights is costly and because a lack of protection induces strategizers to expend resources on costly capture. If a strategizer increases the protection of her property rights in order to reduce others' capture,

she may reduce one kind of value dissipation while increasing another one. Similarly, reducing protection in order to save on protection costs increases others' capture efforts. Therefore, for a given strategizer there is an optimal amount of dissipation, namely the amount that maximizes appropriated value.[10] Given such an optimum, changes in the costs of protection and capture change the amount of dissipation. For example, a strategizer's cost of protection may decrease because he adopts or creates new sales practices (as in the DeBeers example), contractual forms, or sorting or monitoring technologies. Capture and protection efforts will be different in the new equilibrium.

Direct and indirect dissipation

Two kinds of dissipation exist. Protection and capture *directly* reduce realized value compared to the zero transaction cost situation because the efforts themselves are costly and therefore consume value. Protection efforts, such as attribute measurement and exclusion of non-owners, are examples of direct dissipation. An example of capture that directly dissipates value is customers who sort between unsorted goods of varying qualities in order to select only those that have a higher value than the posted price.

Protection may also lead to *indirect dissipation* to the extent that the value-creating exchange of property rights is hindered, as when knowledge is kept in-house in order to protect against imitation (cf. Reed and DeFilippi, 1990). The knowledge does not then become an object of know-how exchange within a network of reciprocating firms (Von Hippel, 1988). Losses in the form of unrealized gains from knowledge exchange constitute one form of indirect dissipation, while capture may be another. For example, if many consumers sort the product, rather than just one, value is comparatively wasted. Moreover, customers may engage in costly competition over unprotected property rights (Barzel, 1997). If capture is sufficiently intensive, indirect dissipation emerges in the form of reduced transaction volume in the market. Other sources of indirect dissipation arise from morally hazardous behavior that induces suboptimal levels of production, and from holdup and imitative efforts that diminish investments.

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[10] Value creation therefore requires that resource owners consider not only their own costs of protection, but also the costs to other strategizers of engaging in capture (Skaperdas, 1994).

Value erosion

The RBV notion of value erosion (Dierickx and Cool, 1989)—value dissipation as seen from the perspective of a resource owner—is easily aligned with the EPR notion of dissipation. Specifically, value erosion refers to the reduction in a resource's value that is induced by a reduction in others' capture costs or by an increase in the resource owner's own protection costs. Value erosion thus measures the change in a resource owner's appropriated value due to changes in the equilibrium between capture efforts and protection costs. For example, producers of digital products experience value erosion due to the declining cost of copies for private users. Value erosion is caused by both direct dissipation (i.e., users' capture costs and producers' protection costs) and indirect dissipation (i.e., investments in intellectual assets decline).

Unowned resources and value erosion

Supporters of the RBV sometimes argue that unique locations are rent sources (see Lippman and Rumelt, 2003b). For example, a unique, non-imitable riverside location for a production site may have the potential of creating sustained competitive advantage due to the low transportation costs it provides to the firm. However, the interdependence between the resource (the site) and the public good (the river) creates a problem of sustaining rents that has not been considered in the RBV literature. While the location may stay inimitable, *ex post* competition may develop for use of the river as other firms located further inland develop less expensive means to bring goods to the river (i.e., the equilibrium is disturbed by a technological innovation). These other firms will also use the river for transportation. If congestion occurs, the actual cost to the firm of transportation is high although the monetary price it pays is low. In the extreme, the firm's locational rents may be completely eroded by queuing costs.

This example illustrates a situation in which a firm can fully protect its own property rights to resource attributes, with the exception of its income rights related to the location of the land. Rents are initially earned because of complementary relations between resources. However, only one resource is under the control of the firm, which makes it harder for the firm to limit indirect dissipation. Even if all resources were owned by the firm, efficiently rationing the use of resources may be costly. For this reason, some property rights over attributes may be left uncontrolled with respect to their use internally in the firm. In those instances, resources are not necessarily sources of sustained rents, since increases in the demand of some attributes may result in value erosion of other resources. In sum, the EPR clarifies value erosion in the RBV (Dierickx and Cool, 1989: 1508).

Sources of value creation: Good news for strategizers

The above reasoning points to two main methods of value creation that emerge with the introduction of transaction costs. The first is to reduce protection costs so that *direct* value dissipation diminishes. The second is to reduce *indirect* dissipation. The following example illustrates how the reduction of direct and indirect dissipation translates into value creation.

Consider a uniquely located (hence, inimitable) parking area that is adjacent to and owned by a supermarket.[11] In this case, customers value the combined good, namely the combination of what the supermarket offers and the parking spaces. This will be reflected in both the demand the supermarket faces and the prices it can charge. The supermarket will earn a profit from being located next to the parking space. The source of this profit is the positive externality in consumption. Thus, use rights to the parking space are unprotected in the sense that non-owners can use this attribute without directly compensating the owner. However, the owner will still make the parking space available to non-owners when she can appropriate its value through its complementarity to the supermarket's offerings.

Assume now that the supermarket's pricing decisions can be represented in terms of the monopoly diagram familiar from economics textbooks (see Figure 1).

D_1 is the demand curve that the supermarket would face in the absence of the parking space. Created value is represented by the area *IJHC*.

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[11] If instead the supermarket did not own the parking space, it would be more costly for it to take measures to control dissipation of the value created by the parking space: patrons of other shops would compete with the supermarket's customers for the parking space, and such competition would gradually erode the rents earned by the supermarket on its location. This is the same situation as in the above example of the riverside location.

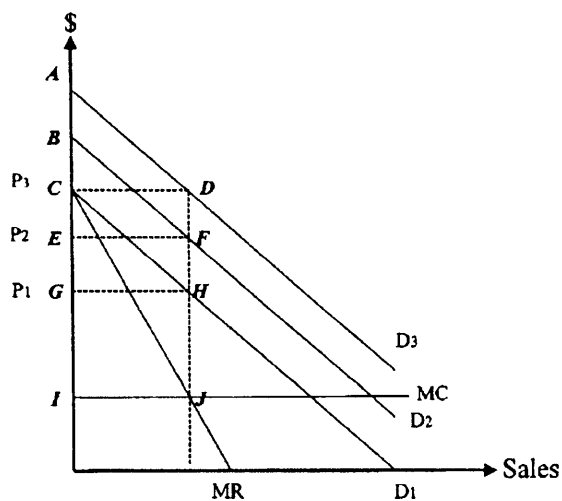548　　*K. Foss and N. J. Foss*

Figure 1.　Value-creating price rationing

However, if the supermarket constructs a parking space and does not restrict its use, D_2 is the combined demand curve for the goods offered by the supermarket *and* the free services of the parking space. The price is lower in the absence of the parking space (P_1), because consumers value having access to a parking space. Total created value increases by *BFHC* to *IJFB*. The supermarket can appropriate *EFHG* ($=$ *BFHC*) by charging the higher price (P_2) for its goods. However, when a limited number of parking spaces are offered for free, customers queue for those spaces. This results in direct dissipation of value in the form of waiting time and indirect dissipation in the form of a smaller transaction volume than would have obtained if queuing costs were zero. (In Figure 1 it is assumed that not all value is dissipated in this way).

Value dissipation can be reduced if the supermarket extends the number of parking spaces, or if it protects its property rights and charges patrons for parking. The demand curve will shift outwards because customers have to expend fewer resources on queuing. Total created value increases by *ADFB* to *IJDA*. If the supermarket charges the equilibrium price that fully rations parking space (i.e., $P_3 - P_1$), and prices supermarket goods at P_1, it can appropriate the extra value (*CDFE*) generated by pricing the parking space.[12] The cost of

pricing the parking space has to be subtracted from *CFDE*, so as long as this cost is less than *CFDE*, to the supermarket gains value by pricing the parking services.

We have thus far assumed that the value of each parking space to customers is independent of location and time. However, in reality customers value parking spaces next to the entrance higher than other spaces, and they value parking at peak shopping hours more than at other hours. A single price will therefore not perfectly ration the use of parking spaces. If the supermarket can devise means of reducing the cost of pricing and enforcing property rights to these attributes, it will appropriate an even greater portion of the resource's value. In the case of a parking space, this may require investments in resources such as ticket and control systems. The ability to reduce indirect dissipation and capture a greater share of the value of attributes provides incentives to invest in such transaction cost-reducing technology.[13]

Pricing the parking lot is not the only means by which the supermarket can limit indirect dissipation. Alternatively, the supermarket can limit the time cars are allowed to park or it can limit access. However, the only way to *fully* limit indirect dissipation is to price each parking space according to its attractiveness to costumers. This may suggest that resource attributes should always be priced to fully realize their value-creating potential. This intuition is incorrect, as pricing is costly in the presence of transaction costs (Coase, 1988).[14]

Resource attributes are not priced when it is prohibitively costly to exclude non-owners from

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[12] Here we have assumed that extending the parking lot is more costly than pricing parking services. Although customers are never worse off in the example, the monopolist supermarket captures all created value from the parking space and from

pricing parking spaces. In other words, customers have no bargaining power. Also, we have assumed that customers have similar queuing costs and valuations of parking spaces. Relaxing these assumptions does not compromise the overall conclusion.

[13] Will the supermarket earn rent on the parking lot? The answer to this question depends on: (1) its ability to keep the transaction cost-reducing resources inimitable; (2) the costs of acquiring these resources; and (3) its bargaining with landowners and construction companies as well as other strategizers who are interested in acquiring the land for resale to the supermarket. It may be common knowledge that parking spaces adjacent to supermarkets create value for the supermarket, although the supermarket is unable to price each parking space. Rents may then be captured by suppliers, or by strategizers who acquire the land for resale to the supermarket. The amount of rent captured by third parties depends on the specificities of the bargaining situation.

[14] Cf. Lippman and Rumelt's (2003a: 1085) observation that '... intuition suggests that a resource bundle will be more valuable if it can be accurately priced.' Transaction costs determine whether resources 'can be accurately priced.'

capturing property rights to the attributes, when attributes are costly to define and measure in verifiable ways, and when resource attributes are not in demand. More generally, some attributes and entire resources are more costly to price accurately than others, making it more costly to constrain dissipation for these resources. However, by restricting access to such resources, firms can limit dissipation and maximize value. This type of restriction arises when resources are kept in-house, a key theme in the RBV (Dierickx and Cool, 1989; Reed and DeFilippi, 1990).[15]

TRANSACTION COSTS AND SUSTAINED COMPETITIVE ADVANTAGE

The EPR is not a strategic perspective per se and does not directly address the issues of why some firms are persistently more successful than others. Thus, the issues of why firms are heterogeneous and pursue different strategies are not directly addressed by EPR. In contrast, firm heterogeneity is central to the RBV and much research has been directed towards establishing the circumstances under which firms earn sustainable rents from superior resources. Unlike the RBV, the EPR does not distinguish between the resources that give rise to sustained rent and those that do not. Nevertheless, the EPR can contribute directly to strategic analysis.

EPR's contribution to the analysis of sustained competitive advantage starts with the central point of the preceding discussion. The value that strategizers will realize and appropriate from resources depends on transaction costs. Thus, the rent differentials that resources create are partly a function of the differential costs of protecting resource attributes from capture. If a resource owner is able to create and appropriate more value from her bundle of resources compared to the competition, she has the potential of enjoying a sustained competitive advantage. In other words, sustained competitive advantage depends on transaction costs.

Determining the conditions under which firms enjoy a sustained competitive advantage is one of

the main issues in the RBV. Barriers to competition are particularly important here (e.g., in the notions of *ex ante* and *ex post* limits to competition; Peteraf, 1993), and much effort has been put into the identification of factors (such as the nature of the resource or the resource accumulation process) that create such barriers. Competition is also important in the EPR (Alchian, 1977), but the main focus is on competition for less than perfectly protected property rights (Barzel, 1997; Hirshleifer, 2001). As has been argued, such competition is important in determining the value that a resource can create and the value that the owner of the resource can appropriate. Analysis of how transaction costs influence competition over less than perfectly protected property rights, therefore, provides important contributions to the RBV with respect to understanding the conditions for sustained competitive advantage.

Peteraf (1993) has elegantly summarized much of the RBV into 'four cornerstones of competitive advantage' that represent necessary conditions for sustained competitive advantage. In the following, these cornerstones serve as a means of more precisely identifying the contribution of EPR to furthering the RBV analysis of sustained competitive advantage.

Heterogeneity

The RBV analysis of heterogeneity stresses inherent efficiencies of resources (Peteraf, 1993) and differences in resource complementarities (Dierickx and Cool, 1989; Denrell, Fang, and Winter, 2003) as sources of firm heterogeneity. The EPR contributes a further dimension to resource and firm heterogeneity by stressing that resources are composed of property rights to attributes. Property rights are typically bundled in resources due to the cost of exchanging individual property rights and the cost of protecting these rights. Resources are therefore outcomes of processes of economizing transaction costs, and they vary in their efficiencies and potential for being combined in a complementary manner because they encompass different attributes.

By implication, resource heterogeneity fluctuates with innovations in sales practices, contracting practices, and other transaction cost-reducing technologies as well as with changes in legislation and norms. Firms thus have heterogeneous resources

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[15] Resources may also not be priced because they are extremely firm specific (Lippman and Rumelt, 1982). Such resources are best used in-house. The fact that there are no prices on such resources does not imply a potential for value creation. However, we doubt that such resources are common.

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not just because of different initial resource endowments and subsequent learning effects, but also because they are subject to different regulations (i.e., constraints on use rights), and face different costs of protecting and utilizing resource attributes in production or exchange. When resources change with changes in transaction costs and legislation, so do the values they can create and that the firm can appropriate.

Barriers to *ex ante* competition

The RBV stresses *informational* barriers to *ex ante* competition as a necessary condition for rents (Barney, 1986; Makadok and Barney, 2001). The EPR adds a different mechanism by which discrepancies between value and price may be established on strategic factor markets.

In the EPR, resource heterogeneity is caused by variations in the types and levels of valued attributes that resources embody. Such variation requires costly measurement (Barzel, 1997). Costly measurement implies that not all attributes are priced and that some strategizers may be able to capture value from non-priced attributes (Barzel, 1982). Strategizers on strategic factor markets that have low costs of capture because of superior efficiencies in searching and/or low opportunity costs for searches will be able to purchase resources—bundles of property rights over attributes, *including* the highly valued one—at prices below their value to the seller. This indicates that rent capture is connected to transaction costs (in this case, measurement costs), and that variation in the attributes of resources is a dimension that is important for understanding rent capture.

Barriers to *ex post* competition

The general lesson from both the RBV and the EPR is that barriers to *ex post* competition are a necessary condition for the sustainability of competitive advantage. However, *ex post* competition may be conceptualized more broadly in the EPR than in the RBV. In the RBV, *ex post* competition is mainly a matter of competitive imitation and resource substitution (Barney, 1991).

The EPR adds to this by pointing to *ex post* capture in many other forms, such as moral hazard, adverse selection and holdup, and to other elements of competition over less than perfectly protected attributes (see further Barzel, 1997). All of these capture activities can be subsumed under *ex post* competition for unprotected property rights over resource attributes. The value that the focal firm can appropriate from its resources is determined by the capture activities of other firms, the firm's bargaining power *vis-à-vis* suppliers, buyers and employees, and the capture of employees. If capture activities are fully foreseen before the resource is acquired, their impact on value creation and appropriation will be taken into account in the reservation price of buyers (or sellers). However, if there are (transaction) costs for estimating capture or unforeseen changes in transaction costs, value erosion will occur. Thus, when forming expectations about future resource values (Makadok and Barney, 2001), managers should also assess the capture potential that is associated with these resources.

The EPR can expand the avenue of research pursued in the RBV with respect to identifying resource characteristics that may limit *ex post* competition and contribute to sustained competitive advantage. In the RBV, causal ambiguity is often seen as a characteristic that supports sustainability (Lippman and Rumelt, 1982). However, from an EPR perspective, causal ambiguity may also make it costly to write contracts and enforce performance norms. Causal ambiguity may therefore reduce value creation and appropriation. This creates a trade-off between protecting against imitation and protecting against other forms of capture.

Immobility

While the RBV suggests that resource immobility is preferable from the firm's point of view, transaction costs imply that immobility leads to underinvestment. Granting resources outside options, such as giving patent rights to research scientists, may increase their bargaining power (make them more 'mobile') *and* improve their investment incentives (Hart, 1995). This points to a trade-off in certain situations between immobility and value creation, and therefore refines the analysis of immobility as a condition of sustained competitive advantage.

CONCLUSION

Contribution to theory

Coase's (1992: 716) insight that '... a large part of what we think of as economic activity is designed

to accomplish what high transaction costs would otherwise prevent' has important implications for the RBV of strategic management. Incorporating transaction costs more fully into the RBV introduces new sources of value dissipation and erosion. As suggested by Coase, strategizers will actively seek to reduce the value dissipation and erosion caused by transaction costs. In essence, strategic opportunities arise from reducing transaction costs.

The purpose of this work has been to clarify how transaction costs create opportunities for value creation and appropriation. The argument used the EPR lens to develop a more refined understanding of the notion of a resource and of the determinants of resource value. Resources can usefully be conceptualized as bundles of property rights to resource attributes, where the relevant property rights are subject to potential capture and therefore need protection. Capture and protection are costly activities that directly and indirectly diminish created value relative to the maximum value attainable if transaction costs are zero. Thus, transaction costs, along with conditions of scarcity, demand, imitability, and sustainability, influence resource value. Strategizers have incentives to create value by reducing dissipation, taking into account that such reduction is also costly and provided they can appropriate a sufficient part of the created value. The reduction of dissipation takes various forms, including the pricing and protecting of resource attributes. These insights refine the RBV analysis of sustained competitive advantage by adding new dimensions to notions of resource heterogeneity, *ex post* and *ex ante* competition, and immobility (Peteraf, 1993).

Taken together, all this indicates that the EPR can significantly contribute to the RBV analysis of strategic opportunities. According to Lippman and Rumelt (2003a: 1080), the RBV predicts that firms will focus their energies on developing 'complex "homegrown" resources ... Yet a glance at corporate reality reveals that much more effort is devoted to combinations, deals, mergers, acquisition, joint venture and the like.' They therefore suggest that more attention be devoted to such resource assembly, particularly under conditions of super-modularity. We concur, but argue that created value is not only constrained by knowledge of resource complementarities, but also by the transaction costs that attend the exchange aspects of 'combinations, deals, mergers, acquisition, joint

venture and the like.' Even more generally, the EPR indicates that resource value is significantly influenced by transaction costs, and that strategic opportunities arise when the transaction costs of defining, protecting, capturing, and exchanging property rights change.

Future work

The present paper is among the first applications of EPR to the RBV (see also Foss and Foss, 2000; Kim and Mahoney, 2002; Foss, 2003). Much work remains to be done. Among the many new avenues for development of the RBV that are implied by the EPR are the following.

Further theoretical development

This work has primarily examined how notions of transaction costs and property rights refine the understanding of resources and value creation and appropriation. Further theoretical development may proceed along at least three paths. The first begins with the observations that resource value is threatened by all sorts of capture efforts, and that competitive activities may be understood in terms of the capture and protection of property rights (Barzel, 1994). EPR may help to integrate the RBV with strategic theory that is more concerned with the external environment (Porter, 1980). A second path of development is to address those resources that create value because they economize transaction costs, such as specific ways of sorting goods (e.g., in retail and in such markets as fruit and vegetables), sorting customers (e.g., credit classes in banking), contracting, and the use of private orderings (Barzel, 1997; Williamson, 1996). While such resources have been neglected in the RBV (but see Mahoney, 1992; Chi, 1994), they are important sources of value creation. A third path is to connect with the significant amount of literature on technological spillovers (externalities) (Shy, 2001).[16] This literature highlights the central trade-off between limiting spillovers to other firms (i.e., protect property rights to knowledge resources) vs. sharing with these firms (and under what circumstances), and the links this trade-off has with R&D investment incentives. While EPR can frame the central ideas of the spillover literature, the latter adds

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[16] We are grateful to an anonymous reviewer for this suggestion.

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an emphasis on competitive dynamics that is not included in this paper's approach.

Formal modeling

The development of mathematical RBV models has recently begun (e.g., Makadok, 2003). The EPR draws attention to many variables, margins, and trade-offs (Foss and Foss, 2001). Formal modeling is necessary to fully clarify the potentials and limits of this approach with respect to furthering the RBV. One attractive line of research is to apply and develop formal game theory models on contests over insecure (i.e., costly to protect) property rights, and how such contests dissipate value (e.g., Skaperdas, 1994; Hirshleifer, 2001). In these treatments, strategizers are explicitly modeled as having (in our terminology) capture and protection functions, and differential endowments of resources to spend on these activities. Predictions as to which player will win in contests over insecure property rights, how much value will be dissipated, and how alternative kinds of social organization may reduce such dissipation can therefore be made. The relevance of this formal, game-theoretical approach to the non-formal approach developed in the present paper is that the formal apparatus can give precise meanings to such key EPR concepts such as capture, protection, and dissipation. The formal approach can also model the interaction between strategizers that have differential resource endowments, and between different capture and protection efficiencies (i.e., differential capabilities in these activities).

Empirical research

One avenue of empirical research in the RBV has been to pursue the implications for performance of different resource types. For example, Miller and Shamsie (1996) discuss the sources and sustainability of competitive advantage in the Hollywood film studios in terms of 'property' and 'knowledge-based' resources. Empirical RBV work can accommodate the unique insights that EPR brings to the RBV by incorporating in such exercises the 'transaction cost resources' mentioned above—forms of contracting, sorting systems, credit rationing systems, and other practices that firms adopt to protect resource value. While there is reason to suspect that such resources are very important in a number

of industries, extremely little is empirically known about their contribution to sustained competitive advantage. Work on this issue may utilize operationalizations and measures that have been developed in the empirical literature on transaction cost economics (David and Han, 2004).

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