The public interest in resource rent

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Abstract

Resource rent is defined as a surplus value, i.e. the difference between the price at which a resource can be sold and its respective extraction or production costs, including normal returns. Reasons to collect resource rent include ensuring a return to the owner of a resource, avoiding inefficient allocation, and achieving ethical objectives. Rent recovery should not be confused with cost recovery. Cost recovery aims at recovering a variety of costs that arise from resource use, whereas rent is a return to the owner. Rent is best treated separately from externalities even though a negative externality can be seen as a reduction in rent realised by another user of the resource. Depending on their design, rent recovery mechanisms can therefore capture the value of externalities otherwise unaccounted for. Any rent regime has to take into account local circumstances and values (e.g. in New Zealand recreational access to public resources is traditionally free).

Introduction

Resource rent[3] – also commonly known as economic rent – is a concept that has been part of resource management policy in New Zealand for several decades, particularly in relation to the extraction of minerals[4] but also for other resources such as geothermal energy, sand and shingle, and, somewhat more recently, coastal space.

While rent collection for resources such as coal or gas has been relatively straightforward, rent collection for resources such as coastal space has been much more difficult. At enactment, the Resource Management Act 1991 provided for regulations to collect resource rentals in the coastal environment and since 1997 the Act has provisions for collecting coastal occupation charges. But for a variety of reasons, the implementation of these has failed (e.g. see Palmer *et al.*, 2005).

At least part of the problem has been confusion over the concepts involved, i.e. what is meant by the terms resource rent and rentals (e.g. see Kimber, 1994; and Palmer *et al.*, 2005). In some situations, people believe they have ownership and use rights when in fact the public (or the government on behalf of the public) is the rightful owner. For instance, during the debate over coastal occupation charges in New Zealand, boat owners argued: *"Why should I pay for storing my boat on public land, it is public space isn't it"* (see Palmer *et al.*, 2005). Government

briefing papers and cabinet papers also indicate that there is confusion about rent amongst government departments (e.g. see Cabinet, 2006; Cabinet Policy Committee, 2006; Ministry of Fisheries, 2005; Treasury, 2006).

The policy debate over resource rent suffers from a failure to frame the issue properly. While literature on rent is available, it usually does not provide a clear explanation of the concept for a non-technical audience. As a consequence, readers often confuse rent recovery with cost recovery or payment for externalities, or they focus on rent collection mechanisms rather than finding agreement on what they actually want to achieve by collecting rent. If 'resource rent' is to be collected, both officials and stakeholders require a clear understanding of the concept.

This paper aims to clarify the concept and increase understanding of what resource rent is and what it is not. This provides a starting point for discussing why, when and how rent should be recovered. However, rather than using complicated models, we explain the concept in simple terms.

We begin by discussing the range of costs that arise from resource use. This provides the basis for defining and conceptualising resource rent before examining why rent should be collected. We then look at some common questions in relation to rent and its recovery. Before concluding, we apply the concept of rent in a case study on freshwater allocation in New Zealand.

What is resource rent?

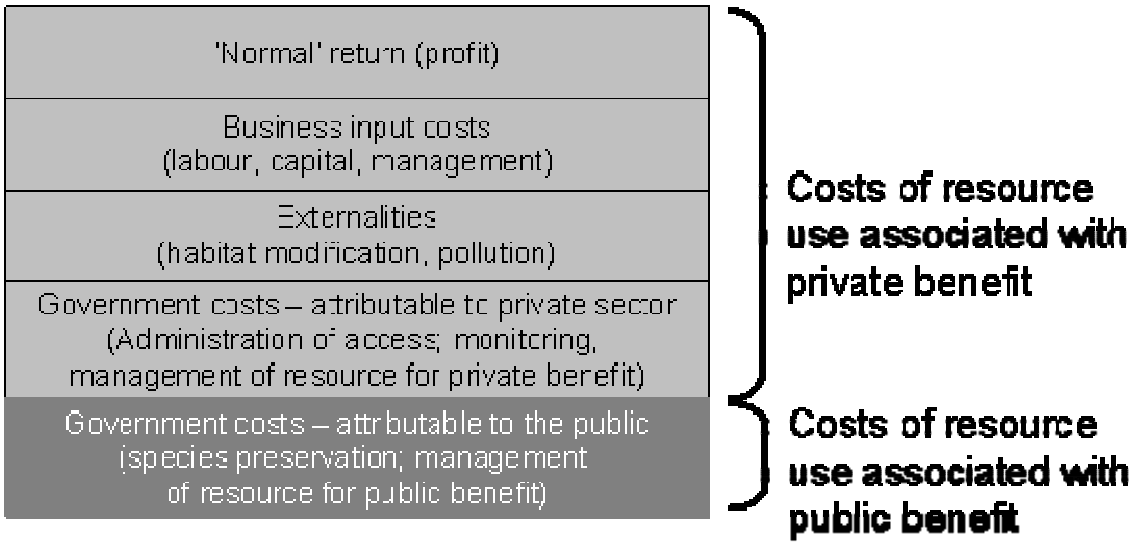
In economics, rent is a surplus value, i.e. the difference between the price at which an output from a resource can be sold and its respective extraction and production costs, including normal return (DFID, 2003; Luchsinger & Müller, 2003; Sharp, 2003; Stoneham *et al.*, 2005).

Thus, before looking at the concept of resource rent itself, it is useful to classify and assemble a list of costs that are associated with resource use (see Figure 1).

Consider a business that wants to use a resource for a commercial venture. Business inputs are perhaps the most obvious costs. They include costs for land, materials and operating costs (including wages), and capital (e.g. repaying a loan). Input costs are also deemed to include the variety of charges, taxes, and rates not directly related to resource use that central and local government impose on all businesses in order to support a range of social functions. These might be thought of as the social costs of doing business.

Externalities are costs and benefits arising from the use of a resource that are experienced by someone other than the resource user and are neither paid nor accounted for. For example, in a fisheries context, negative externalities may include by-catch (e.g. non-target species are adversely affected) and pollution. When paid for, externalities become business input costs.

Figure 1: Cost of Resource Use



Source Adapted from Stoneham et al. (2005)

Government costs *attributable to the private sector* include all those costs that the government incurs to manage a resource for the benefit of the business (or because of the business)[5]. This may include policy development costs, administration costs, and the costs of monitoring, whether or not these costs are actually recovered. In fisheries it may include research costs in order to determine, say, the Total Allowable Catch.

Finally, *'costs' are defined to include a 'normal' return*. 'Normal' return means the return to labour and entrepreneurial/management skills that these resources would get elsewhere in the economy, as well as a competitive return on capital. It typically amounts to between 5 and 10%. (What exactly constitutes a 'normal' return may however be debatable.)

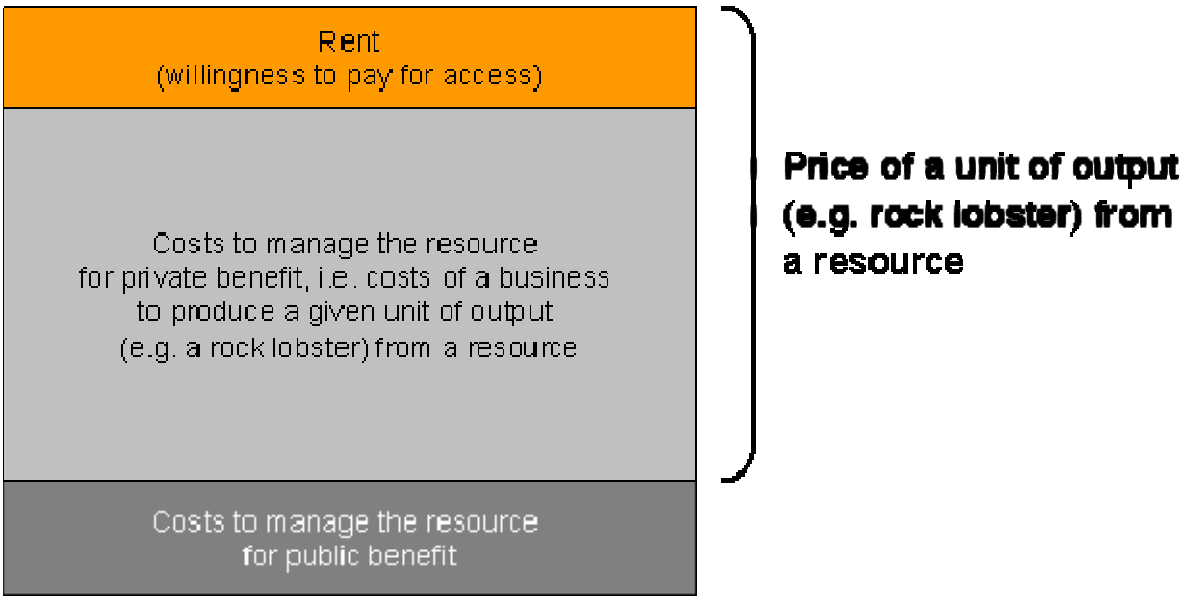
The above costs arise when a business uses a resource. However, some costs of managing a resource are *attributable to the public*, i.e. the government incurs costs to manage a resource for the benefit of the public. This may include costs for species preservation and biodiversity protection or management costs that arise because of public rather than private use. These costs should be paid by the public and are not relevant to the determination of business costs or resource rent.

Rent is therefore the surplus value that remains after all costs, including a normal return (i.e. normal profit), are accounted for.

Resource rent – some examples

Assume a given price of a unit of output (e.g. a rock lobster) from a resource (see Figure 2). As mentioned above, rent is the amount remaining after all costs of a business to bring this rock lobster to the market, including 'normal returns', have been deducted. It is therefore also the maximum 'willingness to pay' for access to a resource. In an auction setting, a fisher would keep bidding for access to the resource up to the point where he or she is able to obtain no more than a normal return from that resource. This maximum bid represents rent – the amount of value in excess of normal returns.

Figure 2: Price of a unit output from a resource

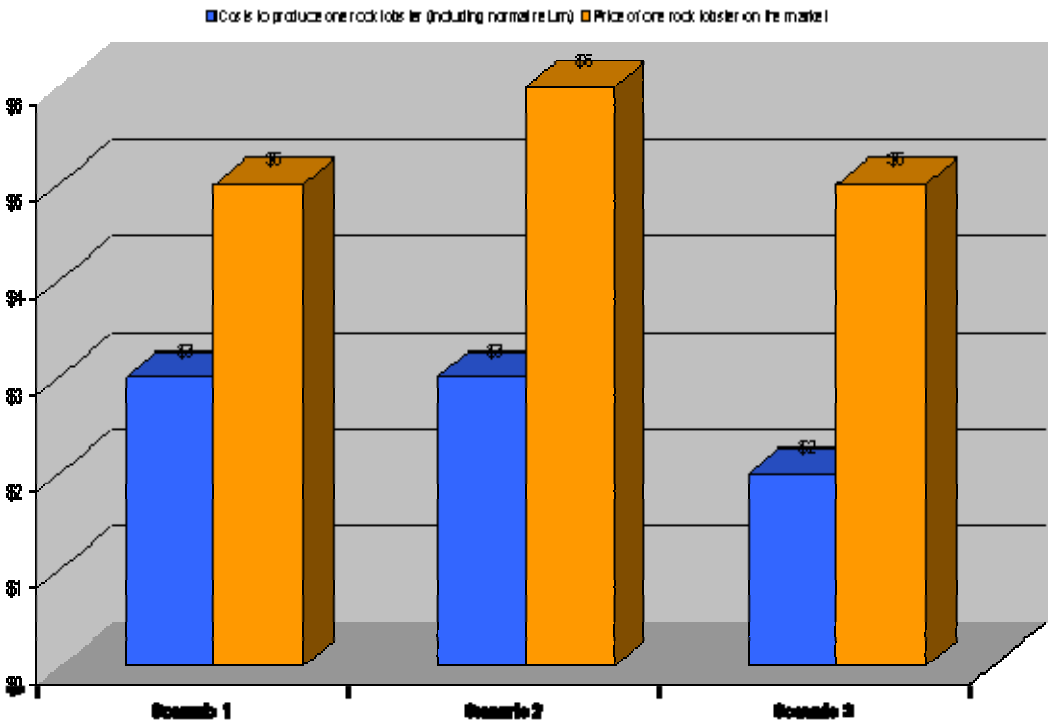


Source: Adopted from Bloneham et al. (2006)

Because costs already include 'normal profit', rent can also be thought of as 'super-profit'. Unless the resource rent is actually collected, this surplus value will be kept by the business over and above its normal profit.

Consider the "production" of rock lobster (see Figure 3). In Scenario 1 the costs to produce one rock lobster (i.e. labour, boat, gear and the like, and including normal profit) amount to $3. The rock lobster is sold for $5 on the market. Resource rent therefore amounts to $2. The fisher would thus be willing to pay up to $2 for access to the resource.

Figure 3: Production of rock lobster



In Scenario 2 the market price for rock lobster has increased to $6, while costs remain the same at $3. Resource rent therefore increases to $3.

In Scenario 3 the market price for rock lobster is unchanged compared to Scenario 1. However, the fisher has managed to reduce costs from $3 to $2. This could be due to his/her entrepreneurial skills and more efficient use of labour and capital. Resource rent increases from $2 to $3.

Thus, when the price of the output from the resource (rock lobster) increases (or decreases), rent also increases (or decreases). Similarly, when the business lowers its costs (assuming the price remains constant), rent increases[6]. Note that, if rent becomes negative, e.g. because prices fall and the fisher can no longer earn a normal return, one would expect higher-cost fishers to exit the industry.

It is also possible that a fisher has access to a more plentiful resource and therefore has lower costs, e.g. $2 instead of $3 per lobster. This fisher will generate more rent, but it is due to the nature of the resource rather than the skills of the fisher.

Rent – more than a monetary concept

So far we have discussed rent only in monetary terms, i.e. a fisher may be willing to pay a certain amount to gain access to a resource. However, conceptually, rent still exists when it is not paid for, it is simply captured by the resource users. This is not a problem if there is no competition

for the resource[7]. However, if there is competition, then questions arise as to how much resource rent is being captured by users rather than paid to the owners of the resource.

In such cases we may therefore need to estimate the rent captured by resource users, including users that are usually not charged (e.g. kayakers on a river). However, economics is most useful when benefits can be accurately and readily quantified in monetary terms but quite limited when benefits are intangible or 'fuzzy' (e.g. the enjoyment we receive by paddling on a river).

It is thus useful to think about rent not only in monetary terms but also in terms of how we value resources and the benefits we may receive from making use of them.

Different kinds of rent

Rent can be categorised into different kinds depending on how it is created. In general one can distinguish three different kinds of rent, which can occur separately or jointly: differential, scarcity, and entrepreneurial rent. Differential rent (also called quality or Ricardian rent) arises because of differences in the quality of similar goods or inputs (e.g. production sites), as illustrated above in the example where a fisher has access to a more plentiful resource. Scarcity rent emanates from excess demand for (or restricted supply of) the good or resource (e.g. scenario 2 in the rock lobster example). Entrepreneurial rent (also called quasi-rent) can accrue due to entrepreneurial skills or managerial investments. A company may invest in advertising, training of employees, and so forth. These investments can result in a higher price (e.g. via branding) or lower costs (better technology) (Banfi *et al.*, 2005; Luchsinger & Müller, 2003). Scenario 3 in the rock lobster example illustrates entrepreneurial rent.

While this discussion helps to clarify the concept and its meaning, it also shows some of the challenges of applying the concept. In practice, identifying and measuring rent is not straightforward. As Sharp (2003) notes, "*at any point in time […] rent is contingent on market conditions, technology and the system of property rights used to govern access and management*". While the market price for, say, rock lobster may be relatively easy to determine, the costs of private businesses are known only to the businesses. In the absence of real auctions for access to resources, this makes an estimation of rent difficult for public officials.

Why collect resource rent?

Ownership

Ownership of a resource such as land is usually thought of in terms of a bundle of rights in relation to this resource. Ownership typically includes the right to benefit from its use, including the right to some form of return (e.g. see Ostrom, 1999; or Scott, 1983 for a discussion on property rights). From this property rights perspective, rent collection is dependent on ownership (i.e. the respective bundle of rights), and conversely ownership entitles owners to a return on their assets.

This entitlement is equally applicable to private and public resources. Nevertheless, while the resource rent in privately owned resources is typically captured by the owner, resource rent in

publicly owned resources such as freshwater or coastal space is typically captured by the user or occupier of the resource. For instance, while the New Zealand government is not unlike a private owner of land (or resources) held in fee simple title, the public rarely collects rent through a lease, rental charge, or royalty for these resources. The wealth is captured by the users, and the public forgoes rent. Sometimes costs are recovered, but that is not the same thing.

Capturing rent generally increases public welfare if the government has expenditure options with positive net benefits, provided that rent recovery does not introduce distortions or transaction costs that outweigh these gains. In principle, therefore, the government should seek to recover rent in publicly-owned resources; failures to do so are more likely to be explained by political considerations than by over-riding public welfare considerations. For example, rather than increasing public welfare by collecting rent, the government might be seeking to maximise votes in the next election.

Avoiding inefficient allocation of resources

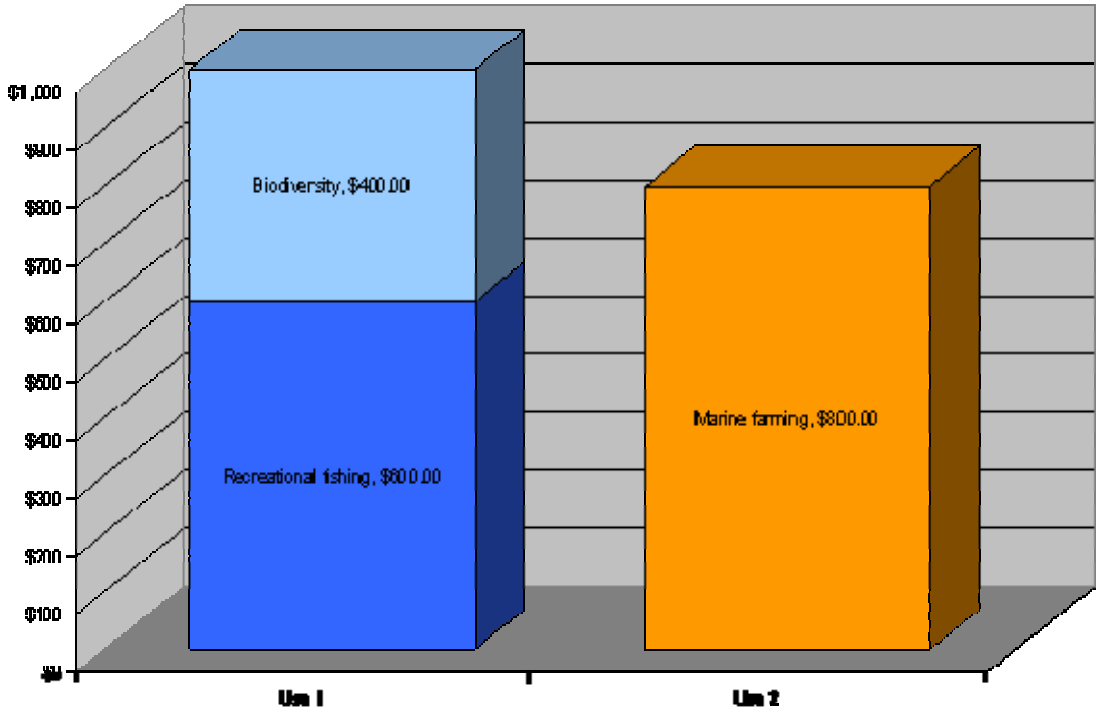
Resources should be allocated to those uses that create the most value (including monetary, non-monetary, tangible and intangible value). The aim is to maximise net benefit and to avoid an allocation scenario where the use of the resource creates value that is lower than the highest value use. Collecting resource rent helps to protect against inefficient allocation of the resource.

There are two different kinds of 'inefficient' allocation. The first is *over-allocation* of a resource, which can result in over-exploitation or congestion. For example, a groundwater resource can be over-used if there is no allocation limit, and roads can be congested during peak traffic flows. In essence, too many users (abstractive water users, commuters) compete for the same resource and reduce the total benefits able to be obtained. Charging rent is a way to alleviate pressure on the resource from competing users, thereby achieving more efficient use.

Over-allocation can also be avoided by simply imposing a limit on resource use – this is often done with water resources. Permits are allocated to the first ones to apply until no more remains to be allocated. This 'first in, first served' approach avoids one source of inefficiency, but not the second – which is *misallocation* of a resource. Just because a resource user was able to get in first does not mean that his or her use is the highest beneficial use of that resource, especially after time has elapsed and prices and/or technology have changed.

Consider coastal space that, in its present state, is worth $600 per year as a favourite fishing spot for local anglers and – assuming that one can estimate the monetary value for things like biodiversity – $400 per year for its biodiversity, shown as 'Use 1' in Figure 4. Suppose that same coastal space is worth $800 per year as a location for a marine farm, marked 'Use 2', and that this is incompatible with the existing uses. Assume further that no private person or group is willing to pay for the biodiversity, or that those who are willing to pay are not eligible to compete for the site.

Figure 4: Considering coastal space and biodiversity as 'Use 1'



Under these assumptions, even if local anglers were willing to pay for fishing, marine farmers would be able to outbid them unless the government charges rent of more than $800 per year (or decides that marine farming in this area would not be permitted). As a result the alternative uses (biodiversity and recreational fishing), which *together* have a higher value than marine farming in this example, would miss out, resulting in inefficient allocation of this coastal space.

The opportunity cost[8] for this area is $1000 per year (i.e. $600 per year for fishing, and $400 per year for biodiversity). Therefore, the authority responsible for this area should charge any commercial users rent of $1000 per year to avoid inefficient allocation. If a commercial user is willing to pay this rent, then it is presumably a higher value use, otherwise the site will remain available for recreational fishers and biodiversity values.

In principle, the value of these competing uses should be taken into account by a local authority when it considers whether to approve use of coastal space for marine farming. But for various reasons, including both legislative and political factors, this might not happen. It is also difficult for a political decision-maker to know the cost structure and profitability of proposed commercial activities, and therefore difficult to determine which use should have preference. Estimating biodiversity and fishing values can also be challenging, of course.

By setting a rental value, a local authority establishes an approximation of what a resource is worth to the community (e.g. for recreational fishing and biodiversity), and competing resource users can decide whether they are willing to pay that much to use the resource. The collection of resource rent can therefore help to avoid inefficient resource allocation.

In theory, local anglers could be charged rent as well, or required to bid for the site. However, such a proposal would need to consider contextual issues (discussed later) and could be impractical given the large number of recreational fishers (typically a significant portion of the general public) and their diverse interests in fishing.

A third type of inefficiency can arise over time if rent is not collected – dynamic inefficiency, arising from missing or distorted incentives for innovation. If the owner of a resources does not collect rent, this can reduce the pressure to innovate because privately captured rent would be artificially inflating profits and could obscure low returns to capital and labour. Not collecting rent can also alter the nature of innovation, directing it to improving efficiency of other "costly" resources rather than the "free" resource that is in fact scarce. If the owner is also the user of the resource, failure to recognise rent as a source of profit can similarly lead to dynamic inefficiency.

Ethical considerations

In addition to the above arguments, there are ethical reasons to collect rent. For instance, Sharp (2003) notes that rent collection can be justified on the basis of inter-temporal redistribution of wealth (see also Caragata, 1989:122), i.e. one can shift the temporal profile towards the future. Based on the notion of 'strong sustainability' (e.g. see Sinner *et al.*, 2004, for an explanation of the 'strong sustainability' concept), the depletion of non-renewable resources such as natural gas may be permitted provided the development of renewable resources compensates for this depletion. Rent recovery from non-renewable resources could thus be used for developing renewable alternatives. Even under the notion of 'weak sustainability', it can be argued that rent should be collected to enable investments that will enhance the welfare of future generations.

A further ethical issue relates to the fairness of some individuals or businesses having free access to a scarce public resource while others cannot enjoy the same privilege because the resource is fully allocated. To take a freshwater example, a farmer with rent-free access to water for irrigation is typically able to pay more for land than a farmer without a water permit and will, as a result, be more successful in competing for land and will generate higher profits. Principles of equity would suggest that these situations are "unfair" (as well as possibly being inefficient), because people are not being treated on equal terms.

In summary, there are three reasons for collecting resource rent: ownership and ensuring a return on one's assets, avoiding inefficient allocation, and achieving ethical objectives.

Common issues regarding rent and its recovery

How much rent should be collected?

Based on the above, one can argue that at least some rent recovery by the government is appropriate from the users of public resources. However, it does not follow that *all* rent should always be recovered in these circumstances.

The prospect of a business capturing some resource rent (i.e. above normal profits) is an incentive for that business to continually improve through innovation. If the government takes

all rent, including entrepreneurial rent, it would remove the incentive to improve, as a business would always be left only with the 'normal' return. Conversely, as explained above, collecting no rent can reduce the pressure to innovate or distort the nature of innovation.

Public rent recovery is therefore a matter of negotiating the right balance – ensuring a return to the owner while still leaving incentives for innovation.

What mechanisms are available for rent collection?

The collection of rent usually comes about through negotiation between the resource owner and the resource user. This can result in a fixed sum, or one of a variety of mechanisms can be used, including auctions, royalties and taxes.

In an auction, the resource owner sells access rights through a competitive process. The rental price would be determined by the offers of the bidders, which in turn reflect bidders' willingness to pay.

Royalties include different types: a specific royalty, an ad valorem royalty and an accounting profits royalty. A specific royalty is a levy applied to the per unit volume of production (e.g. $ per tonne of sand mined). An ad valorem royalty is a percentage applied to the annual value of production (e.g. pay 12.5% of the value of petroleum extracted each year). And an accounting profits royalty is a mechanism whereby the resource owner receives a share of the profits once all significant costs have been recovered (as a percentage of annual profits).

The resource rent tax is similar to the accounting profits royalty in that it takes a portion of the rent after deducting all capital and operating costs from revenue. However, it also allows any losses to be carried forward and only taxes the positive cash flow of a particular operation.

The above mechanisms can also be combined or adapted (e.g. through negotiations). There are also other, perhaps more radical ways, including privatisation of a public resource whereby rent is captured 'in one hit' through the sale value, or nationalisation, whereby the government makes all the profits on behalf of the public.

Which of the collection mechanisms or combinations are most appropriate will depend on the individual circumstances and criteria used (e.g. effectiveness, efficiency, equity, political acceptability).

What are some important considerations for rent collection mechanisms?

When designing a rent collection mechanism, it is important to take into account the following considerations.

First, avoiding or minimising economic distortions is a key issue for rent recovery. By economic distortions we mean affecting the quantity or value of the output so that it is no longer efficient. Sharp (2003) notes that while there is some disagreement in the literature about the distortions introduced by rent recovery mechanisms, auctions and tendering are seen as having the least

negative effects. Nevertheless, while a rent recovery mechanism can introduce economic distortions (i.e. economic inefficiencies), not collecting rent will most likely also create distortions.

Second, a poorly designed rent collection mechanism can negatively affect innovation. For instance, consider an immature (but perhaps preferred) industry that could not pay rent based on competing existing uses (e.g. wave energy). Attempting to collect rent could prevent this immature industry from developing because, at least initially, costs may be very high and only the potential to generate and capture rent would justify development. In this situation, a government (or even a private owner) might choose to forego rent for a period of time (thereby providing a 'rent holiday'), with the prospect of collecting rent in the future. Or a government could use a resource rent tax or accounting profits royalty, effectively sharing the profits and the risk with a developer.

Finally, there may be cases in which rent recovery would be unfair to the resource user. For instance, where resource rent has already been fully captured through an initial allocation mechanism such as an auction for tradable permits, subsequent rent recovery would amount to double dipping (unless the amount is known to bidders before the auction so they can determine their bids accordingly) (e.g. see Sharp, 2003).

Is there a need to take into account the specific context?

Our discussion so far has considered rent in somewhat ideal circumstances and without considering the local context where rent is to be applied. The somewhat theoretical approach – of either estimating rent so that the value of different uses can be compared or making users pay rent for reasons discussed above – will need to take into account the local circumstances or traditional, cultural and societal values.

In New Zealand, collecting resource rent will need to take into account New Zealand's tradition of free recreational access to certain resources; see the case study below. This does not mean, however, that cultural traditions must always be maintained – in some cases, open access is a significant part of the problem and change is necessary for sustainable management.

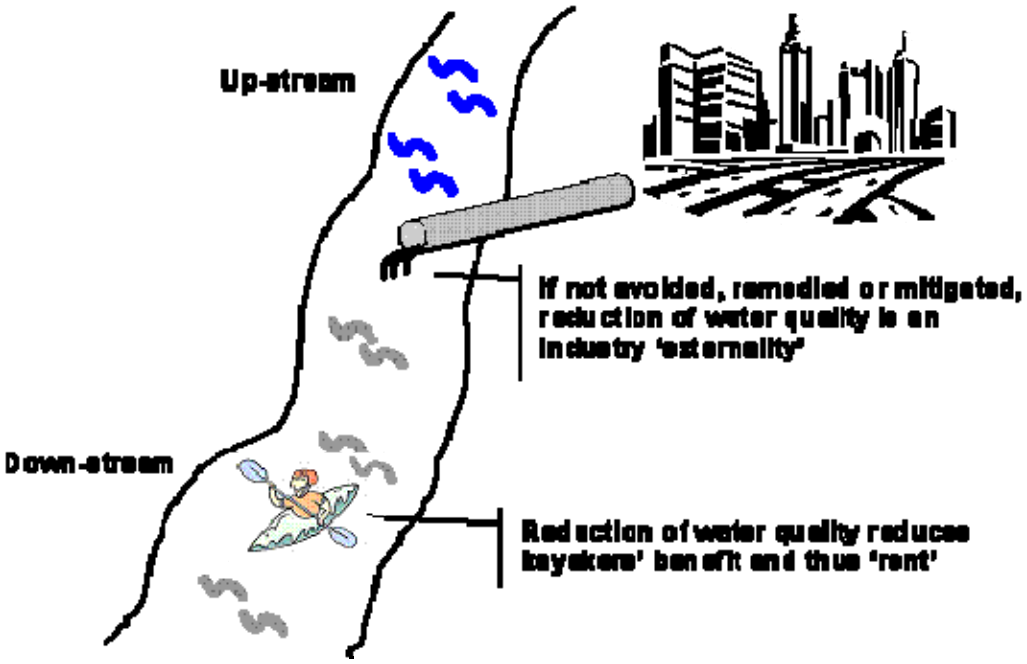
Ownership issues can also be context-specific. In New Zealand, for instance, there are Maori ownership claims to some rivers and other 'public resources'. In such cases it might be possible to hold rental revenue in a trust pending resolution of such claims, or there could be negotiated arrangements with Maori regarding how the revenue would be used.

What is the relationship between externalities and rent?

It was noted earlier that externalities are costs that arise when a business uses resources, i.e. they are best treated separately from 'rent'. However, in practice there can be difficulties when trying to distinguish between rent and externalities. A negative externality can also be seen as a reduction in rent realised by another user of the same or a related resource.

Consider a river where recreational kayakers capture certain benefits, i.e. rent, via the opportunity to use in-stream flows (see Figure 5). Further upstream, another user such as a factory may impact on the river and downstream users via effluent discharges. These impacts reduce rent opportunities for the kayakers and are also regarded as an externality of the upstream use. Charging the factory owner for this deterioration would provide an incentive to reduce the adverse effects. If the factory is not able to pay for these charges out of its profits from using the river, this suggests that the resource has a higher value for kayaking and in-stream values than for discharges from the upstream factory.

Figure 5: Uses of a river



Recall that externalities that are not internalised get captured as rent by either the owner or the user of the resource. In this example, the externality (if unpaid) represents a reduction in the rent opportunity for one set of uses (kayaking and other in-stream uses) and an increase in the rent captured by another – the factory. But resource rent also exists in the absence of externalities; any surplus value represents rent.

Where externalities occur, the important point is to enable the value of competing uses, and all positive and negative effects, to be expressed in a way that creates incentives for the highest value uses to gain or retain access to a resource. This usually means treating externalities directly and devising a separate mechanism to collect rent.

What should rent be used for?

Where resources are owned by private individuals, there is no constraint on how rental income is spent. If someone pays rent for using land, the owner is not required to use this rent in relation to

the property. Instead, it would be up to the resource owner to decide what to do with the money (e.g. buy a car).

Similarly, where the government owns or manages a resource on behalf of the public, in principle there is no reason why rental income should be used only in relation to the resource or activity being charged for. Rather, since the government owns a public resource on *behalf of the public*, the rent should be used in a way that provides maximum benefit to the public.

There is one important caveat to this general principle, however. In the absence of policy instruments to recognise and account for *externalities*, they will appear to be part of resource rent and, depending on the mechanism for collecting rent, could be captured by the owner of the resource. A good case can be made for using a portion of the rent to compensate for those externalities in some way (e.g. creating alternative recreational opportunities or improving water quality).

Water allocation in New Zealand: a case study

In New Zealand, local authorities allocate water on a first-in, first-served basis, i.e. those first applying for a permit to abstract water will usually also be the first to receive their water permit. When the available resource is fully allocated, no more permits are granted, and generally all permit-holders have equal rights. Although permit holders generally pay some administrative costs of their permit, they do not pay for externalities and they do not pay a rental charge for water, i.e. they capture all resource rent (i.e. the economic benefits from using the water).

Over time, increasing amounts of water have been allocated to power generators, farmers, public water supplies and other consumptive users. In some cases, total allocations from a given resource are subject to limits specified in regional plans or water conservation orders, or there are environmental flow or level requirements specified for rivers and aquifers, but many resources are over-allocated (e.g. as observed in the Canterbury region).

Passive users such as anglers or kayakers are often among the existing users of these freshwater resources. Although making use of the resource, they do not consume the resource or use it commercially. Passive users are ineligible to apply for or hold water permits and are therefore unable to secure their ‘existing use’ except by seeking allocation limits or in-stream flow requirements through a planning or rule-setting process. Combined with the first-in, first-served approach to allocation, this can easily lead to inefficiency, i.e. misallocation between uses, as consumptive uses displace passive uses.

Applying resource rent

How can we apply the concept of resource rent to resolve this problem? A local authority could divide a river’s flow into two main parts: a (non-commercial) environmental flow and a commercial allocation. The baseline allocation for the environmental flow would cater for ecological requirements and for a level of recreational, cultural, and amenity values (the environmental flow).

Determining the boundary between environmental flows and water available for allocation to other users is not straight forward, but in principle it should be based on equating the marginal benefits from competing uses, i.e. allocating water so that the value of an additional unit of water for non-commercial passive users is equal to the value of an additional unit for commercial users[9].

Water in excess of environmental flows would be available to commercial users but rent would be payable (e.g. for irrigation, hydro-power, commercial rafting, etc.).[10] Allocating this water via auction would help to ensure efficient allocation between commercial users. This would ensure that the owner, i.e. the public, gets a return from those using a public resource for private benefit. Collecting rent from these users would also improve the efficiency of allocation (provided demand is higher than supply) because higher value uses will tend to acquire the permits.

However, non-commercial passive users might also value these "excess" flows, and there are two possible approaches to ensure they are only displaced if the commercial uses are higher value. First, the regional council can set a reserve price (rental payment) to represent the non-commercial values – a commercial user would get access to water only if they were willing to pay at least this amount. Alternatively, if non-commercial users were sufficiently organised to bid themselves, they could be authorised to hold permits in return for paying rent. This option is generally appropriate only for additional allocations above the baseline where clearly defined groups are the primary beneficiaries.

Rent would not be charged for the baseline allocation, i.e. the environmental flow, for two reasons. Attempting to charge rent for the baseline flow would incur substantial, probably insurmountable, transaction costs and free-rider problems. Secondly, recreational access to freshwater resources has traditionally been free in New Zealand and in this case efficient allocation can be realised without charging rent to these users. Not paying rent does however not imply that non-commercial and passive users have an automatic right to an increased share of (or all of) the water should the number of non-commercial and passive users increase over time.

Efficiency will be further enhanced if transaction costs of transferring permits, after the initial allocation, are kept to a minimum. This enables permits to move to the highest value use (either temporarily or for the duration of the permit) to reflect changing prices (e.g. for electricity from hydro power stations or for products of irrigated agriculture) in a dynamic market economy. However, it is essential that externalities of resource use be well-managed and, preferably, charged for. Otherwise, market-based mechanisms for allocating water between competing uses (i.e. auctions and transferable permits) can actually lead to economically inefficient and environmentally destructive outcomes.

Conclusion

By considering the variety of costs that arise from resource use, resource rent is identified as a surplus value, sometimes called 'super-profit'. There are a number of reasons to collect resource rent, including obtaining a return on one's assets, avoiding inefficient allocation, and achieving ethical objectives. Not collecting rent means it is captured by someone other than the resource owner, typically the resource user. Inefficient allocation can arise either when the absence of rent collection allows low-value uses to pre-empt higher value uses, or when a 'free' resource becomes over-exploited. Ethical objectives might include conserving a resource for future generations and ensuring that all competing users for resources are treated fairly.

Rent recovery should not be confused with cost recovery. Rent is also best treated separately from externalities. However, in practice there can be difficulties when trying to distinguish between rent and externalities. A negative externality can be seen as a reduction in rent realised by another user of the same or a related resource. In the absence of separate mechanisms to address externalities, the value of externalities will typically be captured by resource users and be treated as profit. As such, rent recovery mechanisms, depending on their design, can collect as rent the value of externalities otherwise unaccounted for.

Any rent regime has to take into account the specific context, i.e. local circumstances or traditional, cultural and societal values. Ownership issues, e.g. claims from indigenous peoples, also need to be considered and addressed.

It was noted in the beginning that, to many people, the concept of rent and its application are not clear. We hope that this paper helps to increase understanding and provide a basis for the successful application of the concept in practice.

References

ACIL. (1991). Crown-owned minerals: Allocation and Pricing. Wellington: Resources Policy, Energy and Resources Division, Ministry of Commerce, New Zealand.

Banfi, S., Filippinia, M., & Mueller, A. (2005). An estimation of the Swiss hydropower rent. *Energy Policy 33*, 927-937.

Bardwell, L. V. (1991). Problem-Framing: A Perspective on Environmental Problem-Solving. *Environmental Management, 15*(5), 603-612.

Cabinet. (2006). Coastal Occupation Charges - Cabinet Paper, S7335 (MR120), 1 May 2006. Minister of Fisheries, New Zealand.

Cabinet Policy Committee. (2006). Coastal Occupation Charges: Improving the current regime (Cabinet paper sent to Cabinet Policy Committee on 3 May 06 but withdrawn by MfE and DOC).

Campbell, H. F., & Lindner, R. K. (1989). Fishery Management Rent - Definition and Distribution.

Caragata, P. (1989). Resource Pricing - Rent Recovery Options for New Zealand's Energy and Mineral Industries: Ministry of Energy.

Chan, C., Laplagne, P., & Appels, D. (2003). The role of auctions in allocating public resources: Productivity Commission, Australia.

DFID. (2003). Resource Rent: Department for International Development. http://www.keysheets.org/fisheries/FiscalReformKeysheet2.pdf

DOC. (2006). An introduction to concessions. http://www.doc.govt.nz/About-DOC/Concessions/index.asp

FAO. (1998). Integrated coastal area management and agriculture, forestry and fisheries: Food and Agriculture Organization of the United Nations. http://www.fao.org/documents/show_cdr.asp?url_file=/docrep/W8440e/W8440e18.htm

Kimber, W. (1994). Coastal Rentals under the Resource Management Act (prepared under contract to the Ministry for the Environment, New Zealand).

Löfgren, K.-G. (1995). Markets and externalities. In H. Folmer, H. L. Gabel & H. Opschoor (Eds.), *Principles of Environmental and Resource Economics*: Edward Elgar Publishing Ltd.

Luchsinger, C., & Müller, A. (2003). *Incentive Compatible Extraction of Natural Resource Rent*. CEPE Working Paper No. 21. Centre for Energy Policy and Economics (CEPE), Federal Institute of Technology, Zürich.

Mansfield, E. (1979). *Micro-Economics: Theory & Applications* (3rd ed.): W. W. Norton & Company, Inc.

Ministry of Commerce. (1996). Minerals Programme for Coal: Energy and Resources Division, Ministry of Commerce, New Zealand. http://www.crownminerals.govt.nz/coal/docs/min-prog-for-coal.pdf

Ministry of Fisheries. (2005). Coastal Occupation Charges, Internal document: S7153, 18 November 2005. N. Z. Ministry of Fisheries

Ostrom, E. (1999). Private and common property rights. In *ENCYCLOPEDIA OF LAW & ECONOMICS* (pp. 332-352): Edward Elgar and the University of Ghent.

Palmer, J., Crengle, H., & Sinner, J. (2005). *Implementation failure: Resource Rentals for the Occupation of Coastal Space*. Ecologic Research Report No. 5. www.ecologic.org.nz.

Samuelson, P. A. (1976). *Economics* (10th ed.): McGraw-Hill Book Company.

Scott, A. (1983). Property Rights and Property Wrongs *Canadian Journal of Economics / Revue canadienne d'Economique*, *16*(4), 555-573.

Sharp, B. (2003). Creation and Appropriation of Resource Rent in Ocean Resources: Department of Economics, University of Auckland.

Sinner, J., Baines, J., Crengle, H., Salmon, G., Fenemor, A., & Tipa, G. (2004). *Sustainable Development: A summary of key concepts*. Ecologic Research Report No. 2. www.ecologic.org.nz.

Sinner, J., Palmer, J., Fenemor, A., Crengle, H., & Baines, J. (2005). *The adoption of market-based instruments for resource management: Three New Zealand case studies*. Ecologic Research Report No. 3. www.ecologic.org.nz.

Smith, B. (1999). *The impossibility of a neutral resource rent tax*. Working papers in Economics and Econometrics No. 380.

Stoneham, G., Lansdell, N., Cole, A., & Strappazzon, L. (2005). Reforming resource rent policy: an information economics perspective. *Marine Policy*, *29*, 331-338.

Taggart, M. B. (1999). *Sustaining the Yukon's Economy over the Long Term: The Role of Mining.* School of Environmental Studies, University of Victoria, Canada.

Treasury. (2006). Interdepartmental Discussion Document: Specific revenue mechanisms in environmental policy, 30 May 2006. Treasury, New Zealand.

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[3] Hereafter referred to as either resource rent (in relation to natural resources), economic rent or simply rent.

[4] Some government departments in New Zealand also refer to resource rent as royalties. This terminology is misleading as a royalty is merely a mechanism to collect rent.

Figure 1: Costs of resource use

[5] They may also be termed 'avoidable' policy and management costs in that these costs could be avoided if the resource were not used or exploited.

[6] Of course, this rent is to be understood in conceptual terms. It does not mean that this rent is actually collected or paid – this is to be decided by whoever owns the resource.

[7] In fact, if there is no competition, i.e. if the resource is not 'scarce', there is technically no resource rent. Any rent that does exist is due to the unique skills or other attributes of the users – if there were 'surplus value' from the resource itself then other users would be competing for access to it.

[8] Opportunity cost is a term used in economics, to mean the cost of something in terms of an opportunity foregone (and the benefits that could be received from that opportunity). That means that if one chooses to study on Saturday night, then the opportunity cost is the fun the person is missing by not going to a party.

[9] This approach implies that the boundary is determined based on economic rather than political or ideological considerations.

[10] Where there are ownership claims by Maori, it might be possible to hold rental revenue in a trust pending resolution, or there could be negotiated arrangements with Maori regarding how the revenue would be used.