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THE INTERRELATIONSHIPS OF RENTS,
EXTERNALITIES AND THE LAW

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Introduction

Economic rent is an old concept in economics beginning with Ricardo which involves variance in definition, theoretical acceptance and acceptability. One reason for this is that from the introduction of the term there has been controversy over rent's measurement, interpretation and existence. In this paper these controversies are side stepped. The purpose of this paper is to discuss first several perspectives on the concept of rent as a foundation for secondly discussing rent, externality and the internalization of externalities with legal changes. In the next section on rents some old ideas are reviewed first. Then the analysis turns to aspects of rent which largely are currently forgotten in literature but discussed in the European literature before the second world war. Overall this discussion of rents, shows that it is possible under a broader perspective to reconcile the two major views of rent which are often taken as conflicting. Secondly, the discussion shows from a positive point of view that rents do have important allocative functions. This role for rents virtually eliminates the normative positions of Henry George followers who argue for taxing away rents or Marxian economists who argue that private ownership of land is not necessary for allocation purposes. The second and third parts of the paper breaks newer ground as it examines the relationship between laws, property rights, rents and externalities.

There are several important new points that arise from the analysis here. First is that laws which give rise to inefficient resource allocation with externalities give rise to Ricardian rents. Secondly, it is shown that in a high complex economy property rights must be negatively described by general, abstract rules to be well defined. Implicit in this result is, that liability rules cannot create efficient resource allocation.¹

Ricardian Rents, Carell rents, Surpluses and Opportunity Costs

The typical Ricardian conception of rent as a surplus involves defining it as that part of the payment which is unnecessary to the supply. In the case of factors of production it is that portion of the payment beyond the minimum necessary to induce its specific employment and bid it away from alternative uses. To put it more succinctly rent is the part of payment in excess of opportunity cost. When the payment is for an intermediate good and exceeds the total opportunity cost, it is often referred to as producers surplus (differential rents). In this conception of rents their existence and size depends on the elasticity of supply. Complete inelasticity of supply, a la Henry George, implies that all of the payment is a rent. In the polar case of perfectly elastic supply this conception of rent is uninteresting or moot as rents are zero. However, the typical Ricardian case involves partly unelastic supply.²

The term quasi rent was introduced by Marshall in the capital theory³ as a similar phenomenon as Ricardian rent in land rent theory. So from the point of view of basic concept Ricardian rents and quasi rents are the same, each being a surplus.

At the inception of the rent concept, economists concentrated on the perfect Ricardian case with completely inelastic supply. Here the quantity supplied is the same no matter what the price. The rent is not a cost of production (no opportunity costs) and all the factor payment is a surplus. It need not be paid to the factor owner or producer for the supply to continue. Hence, it may be explicitly taxed away, etc. and there will be no effect on the allocation of resources. However, the rent does promote market clearing without positive excess demand. If part or all of the rent were implicitly taxed away by price controls, there would be positive excess demand. Thus the surplus or the

the tax must be paid if prices are attain market clearing levels. Hence absent some tax or other disposition of the surplus the rent payment has an allocative function relative to market clearing or equilibrium.

The prior discussion of rents has focused on the early English language literature. The analysis turns to the question of rents and firm production costs as only first fully discussed in the European literature before the second world war.⁴ In this literature rent is not a surplus over opportunity costs but a necessary factor cost. This notion of rent was discussed regarding land. It was developed by P. Wicksteed, K. Wicksell, and G. Cassel, mentioned in US literature by George Stigler, and completed by Erich Carell.⁵

Let us look at this alternative conception of rent as Carell did. Assume factors of production fit into one of two three categories: land, capital and labor. However, let us allow for heterogeneity in the land quality. Carell conceives of rent for land arising from differences in the scarcity of land quality characteristics and intensity of use. If there are better and lesser amounts of a quality characteristic of land (location, fertility, density, etc.), then each type of land requires a different amount and cost of the other factors, capital and labor. Better quality land requires lower capital and labor costs per unit output. This leads under perfect competition to a higher price for the better land. The worst land which is used is called "marginal land" and earns - if scarce - an "absolute land rent". All better quality land gets an additional differential rent which can also be called a "quality rent". The quality rent can also be seen as an "intensity rent", because better land will be used more intensively, meaning with higher total expenditures for capital and labor.

Three examples illustrate this alternative rent notion. First, suppose one assumes only one possible use for vacant land, apartment housing, and no alternative usage. Assuming this is inexact and unrealistic, since 99 versus a 100 floor buildings represent alternative usages. With a broader

notion of usage, this land has different usage with a 100 floor building as opposed to a 99 floor building. The 100 floor building entails more intensive land usage and more capital and labor employed per geographic unit of land. The user who desires to build 100 floors will be willing to pay more land rent than a builder who will construct only 99 floors, when the better quality land lowers the marginal labor and capital costs for a 100th floor. The difference between what the 100 floor user will pay and what the 99 floor user will pay represents an additional differential, quality or intensity rent which is a necessary part of factor costs, which arise - similar to capital reinvestments - to hold the land in its highest valued use.

A second example concerns land with a desert spring. One could assume its only use is water production. However, it is possible and important to differentiate usage here as in the previous example. Frequent users can be differentiated from continuous users. Each potential usage would influence the determination of the water's price. Suppose sufficient water scarcity that quantity per unit time is limited to the needs of the infrequent users. Certainly the different usages would create different opportunity costs. Infrequent varying demand would create incentives for the spring owner to build a storage reservoir. Thus, more capital and labor will be added to the production activity. The land around the spring and the spring will be used more intensively. The reservoir may allow accomodating all users and increase useful output overall. The addition of the reservoir is completely analogous to the addition of another floor. When the spring can be used with a reservoir, the factor payment for the land will be higher than if the land and spring are used without the reservoir. The increase in the factor payment can be looked at as an additional intensity of use land rent, but it is not a surplus. It is a necessary part of the factor cost so that land is put to its highest valued use.

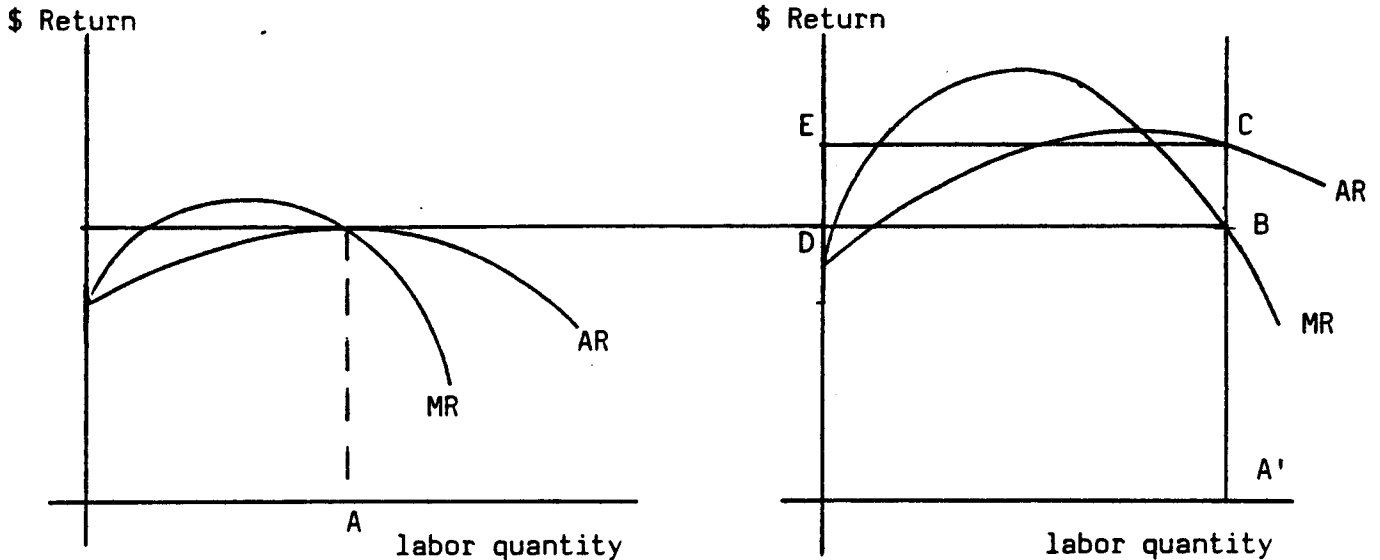
Finally let us consider entertainers. Besides entertaining, one may say that the next best usage of their time is only truck driving, waitressing, etc. However, this perspective is too narrow. There are many different ways they may entertain. In a group of entertainers there may be differences in quality dimensions such as vocal abilities, physical appearance, physical dimensions, etc. The entertainers with high quality characteristics will have competing usages of their time - radio, TV, records, live theatre, etc. They will make more use of other factors of production in addition to their own personal abilities. Hence, their abilities will be used more intensively. Those with high qualities will earn higher Carell rents than those with lower qualities. The difference will be an additional intensity of use rent. But again it is a cost which arise because the necessity to employ the factor in its highest valued use.

The difference between the Ricardian rent and the Carell rent centers on the number of alternative uses of a factor.⁶ Ricardian rents depend on one usage by definition and no alternative usage possibility. The Carell rent conception embodies the notion that there is always alternative usage depending on the intensity with which the factor is used. These differences can be explained graphically as well.

Figure 1 compares two different qualities of land.⁷ The one quality is so low that it is a "free" good. No "absolute land rent" is involved. The other quality is sufficient to create some scarcity in regard to this land's qualities. So an "absolute land rent" will arise. In the left diagram, land is of low quality and a free good. So the labor input (we assume that no capital is involved) will be extended to point A, where average return (AR) and (MR) the marginal return of labor equal each other. With land a free good, A is the optimal point of intensity of usage. On the diagram to the right for higher quality land point A' is the labor usage level and exceeds A. This indicates that it is profitable

to use the scarce high quality land more intensively, with more labor inputs.

Figure 1



Under perfect competition labor inputs are allocated so that their MR are equal. The better land (right diagram) earns a differential rent which is shown by the rectangle BCED. The greater the land quality the more MR and AR are shifted upwards. The labor input on the better land will extend beyond the intersection point of AR and MR. In Carell's conception of rents the differential rent is intrinsic to the more intense use of the land. It is a necessary part of the factor cost of the land so it goes to its highest valued use. In the Ricardian way of thinking there is only one usage for land and the differential rent in the diagram to the right is a surplus and not a part of factor cost and has no allocative function besides market clearing.

Under perfect competition the price for the product is the same whether the land rent exists or not. This means the factor proportions and costs differ. A product which is produced on better land will have less labor costs and more land rent per unit output. Simultaneously, a product which is produced

on free land (free because of bad quality) will require higher labor costs per unit output. In the first case the marginal cost function is the sum of the marginal labor costs and the marginal land cost (arising because of differential rents). In the second case the marginal cost function is equal to only the marginal labor cost function.

Rents and Law

The determination of rents and their classification as a surplus or requisite factor cost is affected by the law. Laws frequently restrict usage of factors or confer privileges. In so doing they may create rents of the surplus or intensity variety. Several frequently discussed examples are illustrative.

Land zoning has received much analysis and discussion largely relative to the question of efficient allocation. But land zoning is a type of law which is intrinsic to rent determination either as a surplus or a factor cost. Zoning laws may be innocuous relative to market allocation of land. Then any rents that arise through the market process are opportunity costs. Noninnocuous zoning laws are the interesting case from an efficiency of resource use point of view of course. These laws restrict alternatives in land use. They make some part of the supply of land for particular usages inelastic. Here the law creates rents in the surplus sense. The factor payments for certain types of land and certain usages will be larger because of the zoning law. This higher payment will be a surplus above opportunity cost in alternative usage.

Governmental franchising of monopoly presents yet another example of how the law can effect the creation of rents as either a surplus or factor cost. Monopoly profits are often described as rents or quasi rents from a short-run perspective. Without any governmental franchising monopoly profits

arise due to an entrepreneur's creativity and productive or contractual efficiency. This profits get dissipated by entry over time. No rents are connected with monopoly in this case.

If the monopoly profit arises from governmental franchise, rents will exist. Their classification as a surplus or factor cost depends upon the specifics of the law giving the franchise. We have to differ two cases. If, firstly, the franchise is specific to one party and not exchangeable or sellable, any monopoly profits are a rent in the sense of Ricardo and a surplus above opportunity costs. This rent may be a short run rent if entrepreneurs are succesful in effectively voiding the franchise through new technological processes, products, etc., and entry. If, secondly, the governmental given franchise is sellable or exchangeable then the "monopoly profit" represents a factor cost to the producer.⁸ But this doesn't mean that no Ricardian rents exist. In this case they are related to the special usage of factors in monopolistic production. The value of factors is higher when they are used in governmentally franchised production than in other sectors. So scarcity is not correctly evaluated correctly in this case.⁹

Rents, Externalities and the Law

The relationship of rents to externalities has been a puzzling question in the economic literature for some time. This is true both from the point of view of uninternalized Pareto relevant externalities and when the externalities are internalized. With our prior discussion of rents and the proper application of property rights ideas, it is possible to establish the relevance of the different rent concepts to external effects, i.e., technological externalities.¹⁰

Let's assume a two party situation with negative externalities. Here agent A "harms" agent B. A's usages or actions are in conflict with B's.

A in his choice ignoring certain scarcity aspects of factors of production used by B. A's opportunity costs fail to reflect these scarcity factors. As A ignores and does not pay the costs of B, the factors used by A are earning a Ricardian rent above the opportunity costs so long as the external effects are not internalized. With external effect the factors used by B are of lesser quality. So the factors earn less than they might if allocated in alternative ways, which are not involved in the external effect. It is of course possible that B earns Ricardian rents before the interaction and conflict with A arises. If this is the case, then the conflict cuts into the Ricardian rents of factors used by B. With the externalities adequate internalized by law, there is no unnecessary surplus above opportunity cost earned by agent A or any of his factor suppliers, similarly for B. All factors only earn their opportunity cost. We come back later on this to describe the type of law which creates efficient internalization.

The situation of A and B just described has been analyzed considerably in the law and economics literature, but not in relation to different rent concepts relevant under different law. Rather the concern has been resource allocation relative to efficiency and uniqueness. These analyses also typically have analyzed legal concepts as a remedy for inefficiency. The legal institutions of interest have been liability assignments and property rights or generic equivalents such as liability rules and property rules, etc. These have been used in the literature with varying meaning and inexactness of definition. Thus it seems mandatory to discuss these concepts and offer some definition beginning with property rights.

One of the first textbook discussions of property rights was by Alchian and Allen in their University Economics. Here property rights are not explicitly defined but are defined indirectly. They say "Private property rights in goods constitute the exclusive rights of the owners to use their goods in any way they see fit, including the right to transfer these rights to other people. Exclusivity of control constitutes a basic component of the private property economic system ... In sum two basic elements of private property are exclusivity of rights and voluntary transferability or exchangeability of rights."¹¹ A similar definition was given by Calabresi and Melamed.¹² Here these ideas are followed as a property right is defined to be a legal title to a usage or action which affords exclusivity of control and transferability.

The term liability has the common element with property rights that it too has been used without an explicit definition. Calabresi and Melamed have inferred also a definition of liability or liability rule when they wrote "When someone may destroy the initial entitlement if he is willing to pay objectively determined value for it, an entitlement is protected by a liability rules."¹³ Later on Polinsky wrote "A liability rules gives each party the right to compensation from the other party for damages suffered..."¹⁴ These precedents are followed as a liability assignment is defined to be a general rule which assures that actions with or usages of resources which damage others will result in an objectively determined payment by the actor or user to the damaged parties.

Clarity of subsequent analysis is enhanced by comparing the definitions of property rights and liability assignment. There are several important dimensions to be discussed. First a property right insures an agent against an ex post liability assignment from an action or usage. It tells an agent ex ante that a usage or action which takes place today and is not forbidden, is free from future damage payments. Simultaneously,

those damages by the acts or usages of another party know ex ante that they will not be able to get damage payments. As a liability assignment assures payments ex post damaging actions or usages to parties other than the user, the liability rule represents a limitation of property rights. Thus the property rights of an individual or a good are usages or actions which are not affected by liability assignments.

Now let us turn back to the externality situation described earlier and look at how liability assignments or changes in property rights can affect the interaction between A and B. First the case of liability assignment is analyzed, but one point must be cleared up. In the context of liability it is not very interesting to analyze a case, where the external effect is due to the use of the same unspecified property right - e.g. the unspecified right to hunt in a certain forest - and where no further unspecified or specified scarce property rights are involved. There is no example where the reciprocal nature of external effects is clearer, because A harms B and B harms A, when the simultaneous use of a property right - e.g. right to hunt - creates a bilateral negative external effect. We know that the appropriate solution for this situation is the specification and personal assignment of the corresponding property right to one of the two persons involved. The problem turns to be more difficult, if we assume that the conflict between A and B involved different property rights. The externality arises because for example the use of hunting property rights (by A) starts to interfere with use of mushroom gathering property rights (by B). We may assume that both property rights were well defined before the conflict. However because of changes in scarcity A and B start to use the rights more intensive interfering and creating an external effect. Suppose that A now acts under a liability assignment. A must compensate B for damages experienced due to A's actions. With this assignment of liability the factors used by A have lesser quality and any Carell rents

earned by the factors are reduced. The factors which are used by B are now like land which has been restrictively zoned for a special purpose. The liability assignment gives them a "false" scarcity. With this false scarcity, they get higher factor returns. These factor returns include a Ricardian rent or payment above their opportunity costs in alternative uses which are not affected by the same liability assignment (e.g. a similar situation were the same factors don't profit from a liability rule). The existence of this type of rent has been indirectly recognized in some prior analysis of liability and liability rules. These analysis recognized that liability assignments of the nature discussed here would cause more firms like B to come into existence as rent seekers. Incidentally the above mentioned facts are one reason why the Coase theorem cannot be true for liability rules. It should also be recognized that liability rules are necessarily linked to the involved parties. No third party outside the conflict can hold that part of right which is called liability or non liability.

Now let us analyze the interaction between A and B when certain property rights are specified and assigned. As in recent literature mentioned¹⁵ the case is simple with an externality which arises because one relevant property right is not specified. Let's take now again a situation where two property rights were well defined and start to interfere because of more intensive use (e.g. hunter who uses his hunting right more intensively and mushroom gatherer in the same forest who uses his mushroom gathering right more intensively). Suppose that the structure of property rights is such that A cannot act without B's approval (this is not equivalent to the situation where B could act instead of A or sell A's property right). Then A must buy the allowance to act from B. This means A and B must bargain over an acceptable level of A's activity (hunting). With this property right structure, the factors used by A are of lesser quality than before relative to the factors used by A are of lesser quality than before relative to the factors used

by B. Those factors used by B are accordingly of higher quality relative to those used by A. The intensity and the proportions in which factors are used will change for both productive activities. The Carell rents earned by factors in both employments will change. Similar to the liability case, factors used by B will have higher rents than the same factors used in an other situation and other property rights structure. So Ricardian rents are created for the factors used by B because the factor payments may be above the opportunity costs. If the law clearly gave A property rights inclusive of damaging B, then an opposite type of negotiation between A and B would occur. A and B would again negotiate with a different outcome. There would be the opposite quality of factor effects. Those factors used by A would have enhanced quality. Those used by B would have diminished quality. Ricardian rents may also arise because some factor payments are above opportunity costs. Intensity of usage and factor proportions are influenced by the change of property rights. This is because resource holders who have not previously supplied resources to either of the activities involved in the externality might choose to supply with the altered property rights structures. Here they would be responding to increases in the Ricardian and Carell rents and changes in opportunity costs. With sufficient lowering of rents it is of course, also possible that resource holders would completely withdraw their supply to the externality involved activities.

The change of factor use seems to be in contrast to some results of the controversy over the Coase theorem.¹⁶ The contrast results from interpretation of property rights. Most writers don't recognize, that the Calabresi-Melamed notion of property right in the weaker form in which it is often quoted¹⁷ is not sufficient to create well defined property rights relative to the conflict and to ensure a market evaluation of a new legal title. This can result in problems, especially in a high complex economy.

If different productive activities are involved in an externality situation rules governing whether the "damaging" party has to bargain ex ante or ex post do not create a new market. Only bilateral negotiations are created. This is also true, when newcomers to the external effect do not participate in the property right¹⁸. So in such a case the result in terms of allocation cannot differ substantially from the liability case. The main difference between liability rules and property rights specified in the above mentioned way is that in the liability case bargaining takes place after the economic period and in the other case before. So we have ex post and ex ante liability to recognize, not liability and exchangeable property rights. Without transaction costs no allocational difference between both cases can exist.

The previous analysis has indicated that there is a need for more precise description of what is called a well defined property right, relative to internalization of external effects and the prevention of Ricardian rents. To clear up this point let us start with the example of two existing property rights, which start to interfere and create an external effect.

Under the solutions mentioned above an accurate market evaluation of the competing activities, hunting and mushroom gathering, would not be possible. Opportunity costs would not reflect accurately scarcity and Ricardian rents would exist. This is because neither ex post liability nor ex ante liability allows maximization of the sum of the Carell rents for both property rights. Instead both situations give rise to Ricardian rents. What could be the solution of this problem?

The answer is sophisticated and simple at the same time: both property rights must be given to one party. The hunting right and mushroom gathering right must come under the disposition of one economic decision unit.¹⁹ Without transaction costs it does not matter which party hold both rights. But it must be one party, whether the hunter, the mushroom gatherer or a third

party. Given both rights to one party, there is no problem of evaluation through markets of the competing usage. The holder of both rights will try to maximize his combined rent from the value of property rights on the corresponding markets.

The difference between the previous analysed case of ex ante liability and the above structure of property rights is a matter of transferability. In the case of ex ante liability, where the mushroom gatherer has the right to prevent actions of the hunter, the mushroom gatherer cannot hunt himself or sell the right to hunt to a third party. This is only possible when he also holds the property right on hunting (vice versa with regard to mushroom gathering).

It should be stressed, that to specify and assign a new property right to internalize an external effect is only necessary, if an unspecified property right becomes scarce (e.g. fish in the ocean as an free resource in earlier times, starts to become scarce so creating conflicts and externalities). When the external effect arises, because the usage of different existing and priorly well defined property rights starts to interfere, we need no additional property right. Joining the existing rights in one hand is necessary and sufficient for efficiency.

Implications for the Evolution of Property Rights

The above results give some insights as to the necessary conditions for lawmakers to efficiently internalize newly arising external effects with new property rights specification and assignment. In a primitive economy it might be efficient to specify and assign property rights, which are restricted on special usage rights (the right to hunt, to gather mushroom, etc.). The more complex the economy is, the larger the number of external effects internalized in the past and arising in the present and in the future. Because it is necessary for proper internalization to join ad-

ditional property rights to a comprehensive bundle of those priorly existing there will exist a "break even" point with regard to specification and assignment of property rights. When the number of property rights controlled by one decisionmaker starts to be larger than the corresponding number of "negative" property rights (prohibitions to act in a certain way), it is more reasonable to specify property rights indirectly in terms of declarations of illegal action or usage. For proper internalization prohibitions must have some characteristics which follow directly from our analysis. The basic characteristic is that such rules should not discriminate or favor any action which is not criminal. Possible dimensions of discrimination are between actions which differ relative to physical or temporal attributes. A physical discrimination would e.g. exist, when hunter are liable against mushroom gatherers. A temporal discrimination against actions with future results would exist, when law is retroactive. A further aspect of discrimination is among different holders of property rights (e.g. discrimination between women against men). So it is possible to summarize the characteristics which are necessary to ensure efficient evolution of private property rights in a high complex economy:

Rules should not

1. address special ends (this means favor or discriminate against actions);
2. discriminate against persons or groups of persons;
- 3, discriminate against future actions.

This is by the way a short formulation of the "general, abstract rules" which Hayek advocates for complex society.²⁰

A legal system which grew up following these rules is able to internalize external effects and to avoid simultaneously Ricardian rents.

Footnotes

¹This has been shown in static framework by Frech III 1979.

²All kinds of rents are in any case qualified by the hypothetical nature of the aggregate demand and supply curves. At any point in time only one point on a demand and supply curve is observed and attained. All other points remain hypothetical "what if" points. They pertain to conditions or situations which do not exist at the analyzed instant. If these conditions did arise at some future point, with price and market interdependence in the economy they would only arise for changes in other markets. These changes would then result in demand and supply curve shifts for the market of concern. Given the probabilistic nature of the surplus conception of rents, the empirical determination of them is impossible. Because of the unobserved part of supply and its frequent change, the opportunity cost of an output, input, legal title or property right is indeterminable and thereby unpartitionable from the total payment.

Because of the short run nature of some rents, the term quasi rent is often used in economic literature (see e.g. Alchian/Allen 1972). From the point of view of basic concept Ricardian rents and quasi rents are the same, each being a surplus and both subject to the theoretical inadequacies noted previously. The distinction seems to exist only out of recognition that the elasticity of supply can and does change according to the length of the time period for which supply is defined. Hence supply may be inelastic over narrow time period but not for the longer time period. The quasi rent term then indicates this and recognizes this short run temporary characteristic of the surplus.

³See Marshall 1930, pp. 71-82.

⁴Alchian/Allen 1972 offers on pp.105-106 a discussion on rent with some of the points made here but with a less complete perspective and different

emphasis.

⁵See Carell 1948 and 1968, Cassel 1932, Wicksell 1913, Wicksteed 1932.

The following translation from Carell 1968 p. 347 gives this position generally.

The older land rent theory which was based on Anderson, West, and Ricardo interpret land rent as a surplus over the production costs for agricultural production. The land rent is no price, which is paid for the use of land. So land rent is also not part of production costs. The land rent is seen as a differential gain which occurs because for one agricultural product the same price is paid with different production costs because of the difference in land quality. Land rent is in this sense not a part of the costs for agricultural products and doesn't influence the price. Land rent follows from the price. P. Wicksteed, K. Wicksell and G. Cassel developed the land rent theory systematically as a theory of price. As for the factors capital and labor it is necessary to pay a price for the use of the scarce factor land. Land rent as a price for using land is - similar to wages and interest rates - a part of the production costs. So land rent is not a result of product prices but a determinant of the product price similar to wages and interest rates.

⁶A similar point is made by Stigler 1966, pp. 247-48.

⁷The diagrams are similar to two found in Carell 1968, p.355.

⁸This point is made in Demsetz 1968.

⁹So Demsetz' argument in his 1968 article is not quite correct.

¹⁰We use the term "technological external effect" in a more narrow way. In our meaning technological external effects exist only when cost or benefit functions are influenced.

¹¹See Alchian/Allen 1972, p.142.

¹²See Calabresi/Melamed 1972, p.1092.

¹⁴ *ibid.*

¹⁵ See e.g. Frech III 1979.

¹⁶ *ibid.*

¹⁷ The Calabresi/Melamed definition of property rights was often misunderstood as some kind of ex ante liability (e.g. Windisch 1981, p. 113-15).

¹⁸ This is because no third party can hold that part of the right which could be called ex ante liability.

¹⁹ Joining the relevant rights should not be mixed up with "merger". In the literature around the Coase theorem a lot of attention was paid to the possibility of mergering to internalize the external effect (see e.g. Nutter 1968). Actually joining the rights must be done for factor owners, not for producers.

²⁰ See Hayek 1960. p. 148-61.

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