THE OPTIMAL ROLE OF THE GOVERNMENT IN A COMPETITIVE EQUILIBRIUM WITH TRANSACTION COSTS

by

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OUTLINE AND SUMMARY

Section I of this paper presents a positive theory of general equilibrium in a competitive economy which includes transaction costs. Paretian optimality conditions are specified in Section II. Section III describes a Pareto optimal government policy for an economy in full competitive equilibrium. This description of the optimal role of the government for any competitive equilibrium with transaction costs is the central theoretical result of the paper. In its optimal role, the government (1) alters the legal system whenever such alterations reduce aggregate transaction costs for a given set of transactions and (2) engages in production whenever such production is profitable in real terms. But the efficient government never simply taxes or subsidizes consumptive or productive activities. This central result is shown not to hold for technologies which permit the joint use of commodities even in the absence of externalities. Section IV specifies two applications: The theorem suggests that democratic governments should be constitutionally prevented from disturbing any competitive equilibrium with specific taxes or subsidies on particular commodities except when several individuals receive simultaneous benefits (or losses) from some commodities. The theorem also demonstrates the Pareto optimality of a relatively laissez faire financial system.

In Section I it is also shown that whenever there are positive private costs of acquiring initial rights to private property, rational, uncontrolled

individuals will devote more resources to the initial acquisition of property (which would otherwise benefit other individuals) than is socially optimal and convert more initially common property into private property than is socially optimal. While the rest of the analysis assumes that all property is initially owned by someone and no property is jointly owned, the result suggests a third role of the government in establishing certain property as common property run by the government or in taxing the acquisition of previously common property. The result also reinforces a suggestion of the central theorem (that democratic governments be constitutionally prevented from disturbing any competitive equilibrium with specific taxes or subsidies on particular commodities other than those rationalized by the presence of collective-type goods) in that it suggests that if a government permits majority rule to tax-subsidize in any redistributional fashion, it will induce individuals to over-devote real resources to the political process in search of redistributions, leading them to compete their net marginal private gains down to insignificant levels while their gross marginal cost, the marginal social loss in terms of foregone real output, remains a significant net cost to the economy.[1/]

Since the first draft of this paper was narrowly circulated in 1968, several other authors (Foley, Hahn, and Kurz) have independently derived theorems similar in formal structure to our central optimality theorem. Our optimality theorem is formally more general only in that it permits <u>both</u> uncertainty and a finite sequence of markets to characterize the competitive equilibrium. However, our discussion of the optimal role of the government, by recognizing the informational basis of transaction costs, differs substantially from that found in the existing literature.

I. THE ECONOMIC THEORY APPROPRIATE TO AN ECONOMY WITH UNAVOIDABLE TRANSACTION COSTS AND THE ASSUMPTIONS OF OUR ANALYSIS

A. The meaning of transaction costs

A transaction or exchange is defined as any transfer of property rights between individuals. Transaction costs are the sum of contract, search and bargaining costs. (The costs of an individual's computing his optimal behavior are assumed to be identically zero.) Contract costs are the joint losses to transacting individuals which result from the initial lack of perfect information regarding the existence and nature of the exchange agreement and the performance of the parties according to the agreement. These include legal fees, court battles, and joint surplus losses resulting from the prohibitive costs of inserting or enforcing certain conditions in an exchange. Search costs are the joint losses to society which result from the lack of initial information of some of the individuals concerning the available exchange offers in the economy. These include advertising costs, shopping costs, and surplus losses due to an individual's rational failure to discover better exchange offers. Bargaining costs are the joint losses to transacting individuals resulting from the lack of initial information concerning the terms of an actual exchange. These include the costs of discovering a trading partner's true reservation prices and of making prior commitments regarding viable trading prices.

We shall assume a competitive general equilibrium so that market prices for each particular kind of good are costlessly known and constant to each individual. This obviously implies the absence of search and

bargaining costs. Consequently, contract costs are the only transaction costs which will be considered in this paper. These costs are still quite a large part of empirically observed transaction costs. They are the joint losses to transacting parties because of the necessity of writing a contract to perfectly protect one's interest in a transaction and include the joint losses due to ignorance or misrepresentation of contract performance, joint losses due to product misrepresentation, and the familiar joint losses resulting from oversimplified contracts such as fixed rental agreements, constant percentage piecerate or quota contracts for workers, budgets or profit-sharing contracts for managers, and cost-plus contracts.

B. Initial acquisition costs

Transaction costs do not include the costs of acquiring the initial distribution of property rights. These costs are assumed to be identically zero as we arbitrarily distribute the initial property in a mutually exclusive, exhaustive pattern. Allowing such costs would immediately admit inefficiencies in a laissez-faire competitive equilibrium because individuals have a private advantage in devoting resources to claiming rights to a given piece of property--i.e., the total revenue from the property--which exceeds the social advantage of these resource-using activities--i.e., the consumer surplus gained by price-rationing the benefits of the property. As a result, too much property would be claimed as private property rather than left as common property and there would be an over-devotion of resources to acquiring property which is not initially owned. Some of the more obvious empirical examples of the latter are:

(1) the California Gold Rush, where the value of the new gold was eaten up by the resources devoted to acquiring it before the next guy could (Abudu) and (2) the overworked fisheries, where competition to acquire a fish before the next guy can get it results in too much current (relative to future) fishing (Marshall).

A recent model of Spence shows a private overproduction of the kind of education which merely identifies, rather than trains, high-productivity workers for firms who cannot initially determine the relative productivities of their different workers without knowing their educational attainments. Using our above result, workers would indeed overinvest in this redistributional form of education if the true productivities of the workers could never be established. However, if true productivities could never be established, then firms would have no apparent way of determining that the better educated workers were the more productive ones. And once we admit that eventually the worker's productivities are established, a system of bonuses can be used to reward those who were relatively productive, thus removing the profit from the activity of redistributional education. When there are prohibitive contract costs of such bonus systems, then the redistributional educational expenditures become a cost of the labor contract and fall under the subsequent analysis in this paper. The exercise shows that optimal government policy in the presence of contract costs may include the kind of tax policy that it uses in the presence of initial acquisition costs.

An element common to property acquisition costs and transaction costs of all types is the devotion of real resources to obtaining property that would otherwise benefit other individuals. It is this element that accounts

for the efficiency of government controls on the property acquisition and transaction processes and the similarity of the efficient controls on these two types of costs.

C. Describing a competitive economy with transaction costs

An economy without transaction costs in competitive equilibrium (e.g., Debreu) can be completely described in terms of consumer benefits and productive services and their respective flow prices (or "rentals") over time. Prices of valuable current benefits and services in a competitive equilibrium in such an economy can be found by equating the current market demand and supply for each benefit and service. Prices and equilibrium amounts of future services and benefits (perhaps contingent on certain technological states of nature) depend upon the time preference and productivity between current benefits and future benefits. Prices and an equilibrium distribution of current rights to future services and benefits depend only on the initial distribution of wealth and the relative attitudes toward risk-bearing between individuals. Capital goods need not be explicitly referred to even though they are the physical sources of consumer benefits and productive services. Bonds and conditional claims are merely contracts through which exchanges of present for future benefits or services are made, and these contracts, like capital goods, need not be part of the description of an equilibrium.

In contrast, an economy with transaction costs cannot generally be described without making reference to capital goods and bonds. Once unavoidable transaction costs are introduced, markets for capital goods will generally replace the markets for benefits or services in a nontrivial

manner. In general, some sequences of separate exchanges of rights to use flows of services or benefits are not worth the sequence of transaction costs required to make such agreements even though exchanges of the capital goods which generate the flows are worth the capital-good-transaction costs. Thus, we cannot generally describe the equilibrium in an economy with transaction costs without making explicit references to transactions in capital goods and future contracts. We shall call any property right -- whether a service right, a leasehold, an ownership right to a present or future capital good, or a conditional claim -- an asset.

We assume that all assets are pure private goods. This is more than a mere convenience intended to rule out the problems posed by non-pecuniary externalities and collective goods[2/]. For it also rules out situations in which some individuals enjoy another's use of a good and pay a market price to subsidize such use. The purpose of this assumption is to assure us that a transaction is required whenever an individual creates benefits for another. Without this condition, our central theorem would not hold. For with third-party beneficiaries of the sales of an output to a given use, it might be efficient for the government to prohibitively tax receipts from the third-parties for the other's use of the good (or prohibitively tax law suits by individuals who lose from another's use of a good) and then merely subsidize (or tax) the production of the good to its optimal level. What the government is doing here is creating an externality by closing down markets to certain joint users and then using subsidies or taxes to solve the externality problem, a process which saves transaction costs for a given final allocation of resources to consumption and production activities. Our central optimality theorem implies that the efficient government never

taxes or subsidizes productive or consumptive activities in a competitive equilibrium.

Each of a finite number of individuals is assumed to be maximizing a continuous intertemporal utility function defined over a Euclidean space of consumption benefits subject to a non-empty, compact, benefit constraint set formed by combining an asset budget constraint for each point in time, a constraint expressing the technological cost and benefit flows of each transaction set, and a production feasibilities set. It follows that desired purchase and sales correspondences exist for each asset. And it follows from the budget constraint at each point in time that Walras' Law and zero-order-homogeneity with respect to accounting prices are satisfied at each point in time. We wish to apply the well-known existence theorem of Gale (Theorem 2) to demonstrate the existence of an equilibrium for each point in time for given expectations of future events and prices. But to do so, we require, in addition to Walras' Law and zero-order-homogeneity, the continuity of excess demand correspondences and the convexity of the set of excess demands that exist at a given set of prices. The usual device generating these conditions is the convexity of preference and production possibilities sets (Arrow-Debreu). But this device will not work in an economy with overhead transaction costs. With overhead transaction costs, the set of individual excess demands at a given set of prices is not a convex set. Without convex excess demands at given prices, there is generally no way to prove that a competitive equilibrium exists, as is illustrated in Fig. 1a. But we shall also assume the presence of competing trading specialists, who each have insignificant overhead transaction costs and are willing to buy, sell, and store any amount of each asset.

The prices at which these specialists trade are determined by transaction costs and their expected future prices and technology. The existence of

Fig. 1a

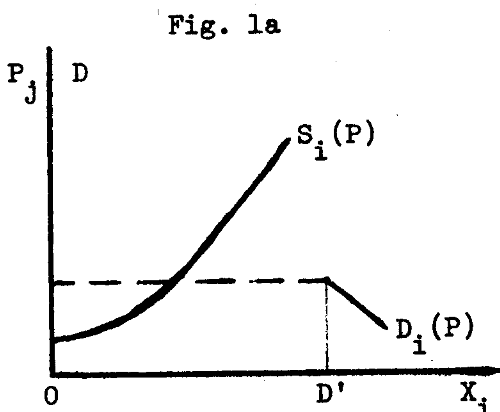
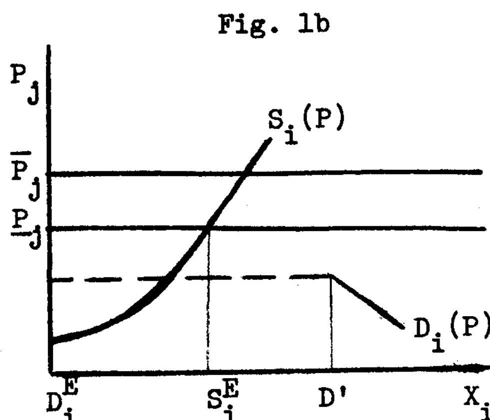


Fig. 1b



X_i = quantity of good i; S_i = quantity supplied of i; D_i = quantity demanded; P_j = the price of good j; S_i^E = equilibrium supply of i given that the suppliers of i are also suppliers of j; $\overline{P}_j$ = buyer's price of j; $\underline{P}_j$ = seller's price of j; $(S_i^E - D_i^E)$ = specialist demand in equilibrium.

these traders assures us that the set of aggregate excess demands at some set of prices is convex and contains zero. This is illustrated in Fig. 1b and is sufficient for the existence of an equilibrium at any point in time, where all prices are non-negative and at least one consumption good price is strictly positive.

D. <u>The optimality question</u>

For the optimality theorem which is the main subject of this paper, we add the assumption that each individual is locally nonsatiated in that in any neighborhood of any consumption bundle, i.e., that there is always a preferred current consumption bundle which contains no less of any consumption good.

While this additional assumption is sufficient for the Pareto optimality of a standard competitive equilibrium, it is not sufficient for Pareto optimality in a competitive equilibrium containing transaction costs, as the role of the government must, in general, also be specified in the latter case.

We shall be concerned with the Pareto optimality of a full competitive equilibrium.

E. Full equilibrium in an economy with transaction costs

A full general equilibrium is said to occur when there is a time-ordered set of desired purchase-sale equilibria, each corresponding to a distinct technology, in which there is perfect knowledge of current price offers, the future price offers that would result under each of the possible future technologies, and the joint probability distribution of future technologies. Consequently, in full equilibrium, individuals all know the probability distribution of "market prices" (i.e., relative prices between assets of agreed upon physical and legal characteristics); they cannot hold differing beliefs concerning such prices.[3/]

Nevertheless, individuals may still have differing probability distributions in equilibrium to the extent that they have differences in information concerning the exchange contract and the physical properties of exchanged assets. These information differences, called contract information differences, are the only source of transaction costs that occur in a full competitive equilibrium.

E. The specification of government policy

We shall assume that there is an economic agent called the government, which sets up a system of contract law, and thereby determines, given rational individual responses to the system, the contract costs associated with each possible transaction. Thus, the government-determined legal structure determines, say by its restrictions on the contract information which individuals can gather and distribute, the contracting procedures whereby individuals are induced to generate certain contract costs. We assume that this legal system is predetermined to be that structure which minimizes aggregate transaction costs for any given set of transactions. (In addition, all governmental administrative costs induced by a transaction are assumed to be included in contract costs by means of a user-tax on the transaction.) Thus, although contract costs are formally represented as technological losses to the transacting individuals, the levels of these costs are determined by a self-interested suboptimization process which is in turn affected by the governmentally supplied system of laws and taxes on transaction activities. The natural adversary relation that arises because of imperfect contract information is what generates self-interested suboptimization processes in which individuals devote real resources to obtaining redistributional gains from their trading partners, the processes which call for governmental restraints on transaction activities.

It should be pointed out that the policies which the government pursues in order to minimize the cost of a given set of transactions is very broad in scope, apparently much broader in scope than the policies which economists

traditionally recommend using the framework of standard economic theory. The government may reduce the costs of a given private transaction by outlawing product misrepresentation, behavior which would have both sides rationally devoting real resources to the production of information advantages which create or prevent mere redistributions between the parties in the transaction. It may also reduce contract costs by imposing certain, universal conditions on all contracts even if the contract specifies otherwise, like caveat emptor and the illegality of penalties for non-performance in excess of actual damages. The government may also reduce the sum of transaction costs by forcing certain transactions that would have taken place anyway (such as land transfers via land appropriation and sale for "urban renewal" and such as the replacement of tax financing with lending via debt financing), thereby eliminating some expenditures of real resources on the production of market information which has purely redistributional effects as it benefits the information producer at the cost of the other party in the transaction (such as information produced by a land buyer about what he is really getting for his money and such as information produced by a private lender about the ability of the borrower to default by "skipping out").

The government may also engage in direct production. Here, we assume that the government directly transacts in assets by producing and distributing any asset in full equilibrium whenever this can be done profitably in real terms (given the costs of each transaction as determined by the governmental policy role described above) and therefore more cheaply in real terms than can private enterprise. Under this policy, the government obviates certain private transactions by itself engaging in production. Fire protection and emergency medical care are important examples.[4/]

In such examples, government production saves transaction costs because government suppliers, in contrast to private suppliers, provide services before attempting to reach a price agreement, if such an agreement is ever reached. In general, the advantage of governmental over private production and distribution is that transaction costs are saved in governmental transactions because of the attenuated profit interest of the government suppliers. This attenuated profit interest is also the source of the government's relative productive inefficiency in that it leads the government to produce generally less efficient quantities at less efficient factor proportions than private producers. When (and only when) the productive inefficiency is less than the transactions efficiency, there is "profit" to governmental production. Alternatively, whenever the "benefits" of governmental production exceed the "costs," there is "profit" to government production.

It is assumed that an individual's purchases and sales have no effect on his relative incomes through its effect on governmental production or the legal system. It is also assumed that any taxes or subsidies that arise (other than the above-mentioned transaction taxes and any user changes for government-supplied private goods) are lump sums. These assumptions will serve to rule out social inefficiencies resulting from: (a) spreads between buyer's and seller's prices which are not justified by real transaction costs and (b) purchases or sales which redistribute from others via induced changes in government policy. More directly, they allow us to use parametric market prices in specifying the budget constraints introduced in Subsection C above.

F. Summary of the specifications and the problem

To briefly summarize the specifications introduced in this section: We shall consider: a complete array of private good-assets in a competitive

economy admitting (a) positive costs of some transactions, (b) specialist traders with no overhead transaction costs, (c) a legal system which determines the level of private costs associated with every possible private transaction set so that aggregate transactions costs are minimized for any complete set of transactions and which does not change with the set of transactions in ways which redistribute incomes and (d) government production under a benefit-cost criterion. This economy always has a current competitive equilibrium, a set of current market prices for which no excess demands exist given the expected joint probability distribution of all future events and market prices of each individual. We shall show that a full competitive equilibrium (a current equilibrium in which the joint probability distribution of all future events and prices is known by everyone) in our economy is a Pareto optimum under the assumption of local nonsatiation.

II. NECESSARY AND SUFFICIENT CONDITIONS FOR A PARETO OPTIMUM

We now state three obviously necessary conditions for Pareto optimal current decisions. The first is that a legal system be chosen among the feasible alternatives such that there is a minimum of aggregate transactions costs for a given allocation of real resources to consumption and real production.[5] By keeping the allocation of resources to consumption and real production the same, we are holding constant the utility levels of all individuals. Nevertheless, the real resources saved by an improvement under the first condition could be used in such a way as to benefit at least one person without harming anyone else. In other words, any change based upon the first condition satisfies a Pareto Condition.[6] The tricky

part of applying the first condition lies in changing the process of making transactions, while, at the same time, adjusting the new economy in such a way that the equilibrium allocation of resources toward the consumption and production or real assets remains the same at the same distribution of utility. This condition for Pareto optimality applies immediately, however, to economic activities which only alter the equilibrium allocation of resources to nontransaction activities through lump sum redistributions of wealth. Such activities should be -- and, like the crimes of blackmail and extortion often are -- effectively outlawed, because, whatever the distribution of wealth, these activities represent wasted transaction costs; the costs of blackmail and extortion are 100 percent transaction costs because they are made solely in order to transfer property rights.[7]

The first condition for Pareto optimality is not implied by our assumption that the government minimizes aggregate transaction costs for any given set of transactions. Transactions for the consumption or production of consumables can conceivably stay constant while transactions can still vary. This can be done by varying transactions made in financial assets. Our prior assumption on the behavior of the government is strong but does not guarantee quantities of transactions in financial assets such that there is a minimum of transaction costs for a given set of transactions in real assets, transactions determining the allocation of resources to consumption and the production of future consumables.

The second condition for a Pareto optimal allocation of resources is that each individual has maximum utility for a given set of transactions. This condition is trivially satisfied in that it is immediately implied by our rationality assumption.

The third necessary condition for Pareto optimality determines an optimal division of resources between transactions and real production or consumption activities. It is simply that there is no alternative set of transactions in real assets that satisfies a Pareto Condition.

These three necessary conditions, taken together with an initial distribution of resources, are also sufficient to determine a Pareto optimal current allocation of resources. For, given an initial distribution of resources and of information, the first condition determines an optimal cost of making any transaction involving real assets, the second condition determines the value of making the transaction by attaching individual benefits to the various real assets, and, using these two conditions, the third condition determines reallocations until further transactions in real assets can no longer be made that will satisfy a Pareto condition. When such a situation is achieved, there is a Pareto optimum.

If there were no transaction costs, these three conditions would degenerate into the second and third conditions. The second would still be trivially satisfied by our rationality assumption. The third, which is equivalent to the familiar definition of Pareto optimality, would of course, be satisfied in a competitive equilibrium containing no transaction costs.

Since the second condition is trivially satisfied under our rationality assumption, we can concentrate on the first and third conditions.

III. ACHIEVING A PARETO OPTIMAL GENERAL EQUILIBRIUM

A. Satisfying the first condition for Pareto optimality

Since we are given minimum aggregate transaction costs for any complete set of transactions, we need only establish that in competitive equilibrium, there is a minimum aggregate cost of transactions in financial assets for a given set of transactions in real assets, in order to assure a minimum aggregate transactions cost for a given allocation of resources to production and consumption activities. Now for a given set of transactions in real assets, an individual's deficit or surplus is given at each point in time. The individual selects amounts of each type of financial transaction which minimizes his cost of financing the given set of real transactions by minimizing the sum of his interest payments and his cost of transacting in financial assets. (This implies, of course, that he is maximizing the difference between his interest revenue and his cost of transacting in financial assets when he has a surplus.) Aggregating these financing costs over all individuals, and using the fact that aggregate interest payments over all individuals are identically zero, we find that aggregate transaction costs have been minimized for the given set of transactions in real assets.

This result may seem rather peculiar because each individual is minimizing finance costs rather than costs of transacting, but it should be kept in mind that when an individual incurs higher costs of transacting "merely" to reduce the interest cost of his deficit, he is reducing someone else's interest return by an equivalent amount and is thereby reducing transaction costs by a like amount. Hence, in a world with competitive banking, when an individual incurs extra costs of transacting in acquiring

bonds which bear higher interest than money, he is also reducing the banks' cost of transacting by an equivalent amount for the latter cost is also equal to the same interest differential. Thus, the conventional Friedman-Samuelson argument for the undersupply of real cash balances does not apply in a competitive money economy. An analogous argument in a competitive money economy with completely avoidable transaction costs is found in Thompson (1973).

B. Satisfying the final condition for Pareto optimality

The original economy, altered by only those programs which enable the economy to satisfy the first condition for Pareto optimality, also satisfies the third and final condition, which states that there is no reallocation of real assets that makes at least one individual better off without harming anyone else. To see this, first note that we may now treat transaction costs as privately incurred, unavoidable real costs of transferring real assets from one user to another; this follows from (1) the assumed taxation of transactions according to the real costs the government incurs in redefining property rights, so that all real transaction costs are private transaction costs and (2) the above-achieved minimization of transaction costs for any allocation of resources to the production and consumption of real assets.

Our proof will make use of a profit maximization condition. Therefore, we make two additional, supporting assumptions. First, output prices are set so that the buyer pays all of the transaction costs and resource prices are set so that the seller pays all of the transaction costs. Our theorem is therefore restricted to the case of no sales of intermediate goods, although we conjecture that a proof exists for the general case. Second, with no loss of generality, we assume that retained outputs are "sold" to the producer at market prices (but no transaction costs).

Now the individual's optimization problem, described in Section I, is a stochastic dynamic programming problem. Following Bellman's Optimality Principle, we consider the last transaction date first. The Pareto optimality of our competitive equilibrium at the last transaction date for given allocations in the previous periods is easily established by a variant of the classic proof of Arrow of the Pareto optimality of a competitive equilibrium without transaction costs. In particular: Suppose that the equilibrium from the last transaction date to the end of life is not a Pareto optimum. Then there is a feasible allocation of resources from that date to the end of life which differs from an equilibrium but which makes someone better off without making anyone else worse off. The existence of locally nonsatiated, rational consumers facing parametric prices and the absence of consumption externalities implies that the allocation hypothesized to be Pareto superior would require a greater value of consumption and therefore of income for an individual who benefits in the allocation and no smaller value of consumption and income for anyone else when the new allocation is evaluated at equilibrium prices. So the aggregate value of income in the new allocation at equilibrium prices exceeds the equilibrium value. But aggregate profits are already maximal over the feasible production set at equilibrium prices. So the hypothesized allocation is infeasible, which is a contradiction. Now, consider the next to last transaction date. Prospective consumption from the last transaction date to the end of life is determined by the savings of each real asset in the prior period. So we may write the next-to-last transaction date's lifetime utility as a function of consumption benefits and savings of real assets in the next-to-last period. This is maximized subject to an income constraint stating that the value of consumption and savings is the value of output in the next-to-last period and a real-asset transactions cost

constraint containing real asset endowments at the next-to-the-last transaction date. This does not deny that individuals hold cash or bonds as stores of value; rather, it converts these assets into their debt-equivalents of real assets in the last period, appropriately reducing the real assets of the creditors and suppliers of cash in the last period so that the net effect obeys a real asset income constraint for each individual. It is crucial here that we have already achieved minimal transaction costs for any given set of transactions in real assets. Now, suppose that there is an alternative, feasible set of consumption and productions in the next-to-last period such that at least one individual is better off and no one else is worse off. Then, as above, the value of present and prospective future consumption evaluated at equilibrium prices must be higher for at least one individual and no lower for anyone else. This implies that profits evaluated at equilibrium prices are higher than in equilibrium, which again is a contradiction as it implies that the alternative allocation is infeasible. This same procedure can be applied to all transaction dates back to the present.

IV. TWO APPLICATIONS

One rather immediate application of our result is in determining the government's optimal role in the financial system. The efficient government may create assets which compete with privately supplied money. As long as they are costlessly produced paper assets, their acceptance as media of exchange is sufficient evidence for their superiority over privately produced paper monies in certain sets of transactions. And the efficient government may control the quality of privately produced monies in order to reduce the cost of transacting with such monies. This can be done, for example, by offering public insurance against the non-redemption (via bank failures)

of the privately supplied monies of contributing banks whose monies also satisfy certain safety features. But it is generally inefficient for the government to otherwise tax (or to subsidize) the creation of private monies. Clearly inefficient are policies which prevent interest payments on private monies, restrict branch banking or entry into the banking business, or tax the private money supply by requiring private banks to transfer government money to the government in order to issue their private money. The superiority of a special variety of this laissez-faire type of monetary system over a system constrained sufficiently for the government to manipulate the total money supply in a setting which permits involuntary unemployment is shown in Thompson (1974).

A powerful application of our result on the general overdevotion of resources to the initial acquisition of property rights can be established once we introduce an explicit mechanism for government decision making. Assume the government decision process is an unconstrained, non-unanimity, voting process. Then the principles of efficient government policies which we have described, once recognized, will be adopted. For a voting system will always choose some Pareto optimal allocation over a non-Pareto optimal allocation. However, if the voting process is allowed to treat questions of income distribution, a Pareto non-optimality arises in that individuals will devote resources to obtaining redistributions through the political process until the real resource cost of obtaining a redistribution is no less than the income which is redistributed. In such a situation, the marginal redistribution leaves the recipient no better off but the loser significantly worse off so that redistributions occur which should not occur from a Paretian standpoint. The individuals would all be better off

if they estimated their lifetime utility, counting future redistributions through the voting process, performed initial lump-sum redistributions in order to achieve at least these utility levels, and then made further redistributions of income with the voting process unconstitutional.[8/]

The strong suggestion of the above application, combined with the central theorem of the paper, is that the efficient government should never tax or subsidize ordinary transactions in an equilibrium unless such policies serve to internalize technological externalities, cancel pecuniary internalities (Thompson (1968)), or close down markets in order to create externalities that are more cheaply internalized by tax policy than by the free market. One may object to this suggestion by arguing that it is too difficult a burden on society to have to gather information on whether or not various taxes satisfy any specific efficiency criteria. But without the specification of the basis of taxation, how can administrators of the private property system know what to do? Consider, for example, a judge deciding, say, a class action suit for smog damage. How can he know whether to admit the suit unless he knows whether or not the observed tax structure is already making the smog creator pay the social cost of the smog? Only by knowing the basis of observed taxes can the judge know he is making a correct decision.

SUMMARY

A Pareto optimum is achieved in a competitive equilibrium containing transaction costs but only pure private goods when the government establishes a legal system which minimizes aggregate transaction costs for each set of transactions and uses real benefit-cost calculations to make production decisions. On one hand, this result permits a more pervasive influence of government than one obtains from the standard view, where only monopoly and externalities rationalize government intervention. On the other hand, it places rather severe limitations on the government policies which can be rationalized in the presence of contract costs. In particular, in a competitive equilibrium containing market imperfections, or positive contract costs, the efficient government applies no taxes or subsidies on property transactions (transactions not involving the sale of contract services or contract information) other than user taxes to collect the marginal cost of government-provided legal services. The efficient government can only alter the legal system or compete with the private sector by producing substitute goods when it is profitable in terms of real benefit-cost analysis. This implies, for example, that while efficient governments may produce money in competition with private enterprise, they may not place restrictions on the private supply or interest rate on private money.

However, our general result on the inefficiency of indirect taxes does not hold once we allow (a) positive costs of property acquisition or (b) goods with joint users. In the former case we have too many resources devoted to acquiring property rights, and in the latter, a Pareto improvement may be possible in which the government prevents the sale of rights to use a good

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However, our general result on the inefficiency of indirect taxes does not hold once we allow (a) positive costs of property acquisition or (b) goods with joint users. In the former case we have too many resources devoted to acquiring property rights, and in the latter, a Pareto improvement may be possible in which the government prevents the sale of rights to use a good

with several simultaneous users and simply subsidizes the output of the good. An additional role of the government suggested by the former is that the government should restrict the private acquisition of otherwise common property, managing and producing the common property under a benefit-cost criterion.

Finally, while the additional role of the government suggested by the presence of goods with joint users in an optimum permits all sorts of taxes and subsidies, these taxes and subsidies must serve only to remove pecuniary internalities and technological externalities; they must not serve to redistribute wealth. The losses of redistributional tax-subsidy policies in a democracy can be viewed as a special case of the general overdevotion of resources to acquire property from others given initially undefined property rights. It would save the resources that individuals in a democracy are continually induced to devote to acquiring or preventing redistributions via the political process if individuals were given, at this moment, the estimated present value of the income they will acquire or lose from the dynamic voting process (static non-unanimity voting processes never have an equilibrium [Thompson (1969)]) and the further redistribution of utility were made unconstitutional.

FOOTNOTES

1/ This does not rule out government produced charity according to the standard benefit cost criteria mentioned above. That is, it does not rule out redistributions which satisfy a Pareto condition given the initial, constitutionally determined, distribution of property (see Thompson (1967)).

2/ While the gathering of information regarding the nature of a contract or a particular product in a transaction creates private transaction costs, the gathering of information which would alter market prices, such as inventions and weather forecasts, need not create what we are calling "transaction costs." If the latter type of information is produced and withheld from the public for a certain length of time in order to reap a speculative gain from individuals who are not aware of the relative inferiority of their information, there would be different expectations of market prices between individuals, and therefore the economy would be out of equilibrium. If, on the other hand, the use of this type of information were immediately sold at positive prices by a system of patents, it would mean that the information is a collective good. Since we are assuming that there is both a full general equilibrium and no collective goods, our model formally excludes the production of the type of information which alters market prices. A freely competitive economy would not be optimal if either differences in market price information or collective goods were to exist (see Thompson (1966) and (1968), respectively).

3/ This was pointed out in footnote 2. Some severe and unfamiliar misallocations resulting from the phenomenon of differing subjective probability distributions on future market prices between individuals are pointed out in Hirshleifer (1971) and Thompson (1966).

4/ However, the most obvious examples are found in the production of several kinds of collective goods such as national defense, bridges, and weather information. Such collective-type goods may be produced by the efficient government, not because of any free market under- or over-production of these goods (which would merely dictate a subsidy or tax policy), but because the private costs of erecting barriers, collecting, and excluding nonpayers (costs which are avoided when the government tax-finances and freely distributes its output of the collective good) may exceed the wastes due to misdirected incentives involved in the government's non-private-property reward structure (see Thompson (1965)).

5/ The aggregate of real transaction costs, when several types of resources are devoted to transaction activities, are dependent upon the weights on resources used in computing these costs. Our weights are the marginal productivities of the respective resources in saving some numeraire resource used in all transactions (say, leisure time).

6/ We have assumed that the government's administrative cost of effecting this change, if the change is possible, is zero.

7/ Examples of these activities which have been allowed to run rampant in the U.S. economy are property ownership exchanges which do not alter the use of the property but are privately advantageous only because the buyer is more bullish regarding the property than the seller. Such "purely speculative" transactions are most familiar in markets for raw land, that will be used by neither the buyer nor the seller, and previously issued bonds and stocks, that are either nonvoting or held for a period too short to allow any owner to affect the decisions of the company. This speculation

problem does not arise in our model because differences in price expectations are not consistent with a full general equilibrium.

8/ One can, indeed, read this in the U.S. Constitution, where Congress is only empowered to make laws in the general welfare. But our courts have apparently chosen to interpret this so broadly that the constraint is meaningless.

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