ON PROPERTY AND CONTRACT IN POLITICAL ECONOMY

David Ellerman, Dept. of Economics, Boston University   Dec. 1973

INTRODUCTION

The purpose of this paper is to present an introductory analysis
of the appropriation and transfer of property in political economy.
These matters have been largely neglected in the price theoretical
models of neoclassical political economy.

VECTORIAL DESCRIPTION OF THE CREATION AND TRANSFER OF PROPERTY

We must first develop a formal apparatus or model for giving an
abstract description of either the de facto (factual) or the de jure
(legal) creation, transfer, and termination of property. In the factual
interpretation of a model, the "creation, transfer, and termination"
of a commodity will mean respectively the production or creation of
the commodity, the transfer in the exclusive factual possession and
control of the commodity, and the destruction, consumption, or using
up of the commodity. In the legal interpretation of a model,
"creation, transfer, and termination" will mean respectively the
creation of the ownership title to a commodity, the transfer of the
ownership title, and the termination or extinction of the ownership
title. We will first describe the mathematical apparatus which may
by used in either a factual or legal model of the operation of a
private property market economy.

We assume that all commodities are "goods", as opposed to "bads"
or "noxious commodities", so that it will be appropriate to call them
"assets". The mathematical apparatus gains in conceptual simplicity
and symmetry if we adopt the following definition of "liabilities":
the loss (respectively, gain) of x units of a certain type of asset
or commodity is equivalently described as the gain (loss) of -x units

of that type of "liability". Let us first restrict attention to trans-
fers. Suppose that a party A transfers a vector of assets $Z = (z_1, \ldots, z_n)$
to a party B and that B transfers a vector of assets $X = (x_1, \ldots, x_n)$
to A. The definition of "liabilities" allows us to describe this
bilateral transfer of assets as the unilateral transfer of the vector
of <u>both</u> assets and liabilities $Y = (y_1, \ldots, y_n) = Z - X =$
$(z_1-x_1, \ldots, z_n-x_n)$ from A to B. For example, if A transferred 2
bushels of apples to B and B transferred 3 bushels of nuts to A, then
that could be described as the A to B transfer of the vector $(2, -3)$,
where the first and second components represent bushels of apples and
nuts respectively.

The definition of "liabilities" is consistent with the evaluation
of a quantity vector at a price vector. If the market price vector
(in dollars) is $P = (p_1, \ldots, p_n)$, then the market value of the assets
and liabilities transferred from A to B is the scalar product $P \cdot Y =$
$p_1y_1 + \ldots + p_ny_n$. The market transaction would be completed if B
transferred $P \cdot Y$ dollars to A. If we treat money as the zeroth commodity
then the total market transaction would be the A to B transfer of the
vector of assets and liabilities $Y' = (-P \cdot Y, y_1, \ldots, y_n)$, and $P' \cdot Y' = 0$
where $P' = (1, p_1, \ldots, p_n)$. The possible market transaction vectors of
assets and liabilities are the vectors Y' orthogonal to the price
vector P'. i.e., the vectors $Y' = (y_0, y_1, \ldots, y_n)$ such that $P' \cdot Y' = 0$.

Assets are not only transferred; they are created and terminated.
The termination (respectively, creation) of an asset can also be
described as the creation (termination) of the corresponding liability.
The transfers of an asset from party to party form a chain (or flow)
which has an initial and a terminal point (a source and a sink).
The same transfers can be equivalently described as the chain or flow
of the corresponding liability in the <u>opposite</u> direction (and <u>backwards</u>
in time, if time is taken into account). Let us take the "holding"

of a commodity as an abstract term which can mean either factual pos-
session and control, or legal ownership. Then the terminal transferee,
terminal holder, or sink of an asset (respectively, a liability) is the
initial holder, initial transferor, or source of the corresponding
liability (asset).

A party can be the terminal transferee and holder of a vector of
assets $X = (x_1,\ldots,x_n)$ as well as the initial holder and transferor
of a vector of assets $Z = (z_1,\ldots,z_n)$. As before, the two-way process
can be simply described as a one-way process. The party is the initial
holder and initial transferor of the vector of assets and liabilities
$Y = Z - X$. The legal creation of the ownership title to the assets Z
is called its "legal appropriation". The legal termination or extinction
of the ownership title to the assets X is the original meaning of the
phrase "legal expropriation" (e.g., "expropriation", Black's Law
Dictionary, St. Paul: West, 1968.). We will construe the term only in
this sense of "termination of title" (so that it is the strict op-
posite of "appropriation"), and not in its acquired sense of meaning
the compulsory legal transfer of title to the government usually
under the doctrine of eminent domain. The term "expropriation" can,
however, be avoided by simply considering the appropriation or initial
ownership of vectors of both assets and liabilities, e.g., $Y = Z - X$.

We will restrict attention to the canonical or paradigm case where
commodities are produced or used up as the deliberate result of
intentional human activities, so that some party incurs the de facto
responsibility for creating the assets and liabilities (i.e., the party
which performed the activity). This case is broad enough to include
normal consumption and production activities. In the canonical case
where there is a de facto responsible party, the basic principle of

legal imputation (i.e., legal responsibility assignment) is the
responsibility principle: that legal responsibility is to be imputed
in accordance with de facto responsibility. That is, the legal
responsibility for creating a commodity or for destroying, consuming,
or otherwise using up a commodity is to be imputed or assigned to
the de facto responsible party. Thus the legal appropriator (i.e.,
initial legal owner or holder) of a created asset or liability is to
be the party de facto responsible for creating the asset or for creating
the liability (by using up the corresponding asset). When there is
no intentionally responsible party, then the law must fall back upon
various secondary imputation principles involving concepts of
"negligence", "strict liability" (i.e., liability without fault), and
"cost minimization". Many interesting cases, where the ordinary canons
of legal responsibility do not seem to apply, have been discussed in
the contemporary legal and economic literature on products liability,
accident liability, and externalities.

The last piece of needed formal machinery is an abstract description
of a party performing responsible actions which create assets and
liabilities. We must utilize, in these political-economic models,
the juristic distinction between (natural) persons (i.e., responsible
agents) and things (i.e., merely causal or productive agents), and
between the responsible actions of persons and the merely productive
or causally efficacious services of things. Since the concept of
"responsibility" has been somewhat neglected in political economy,
it may be useful to first informally compare it with the notion of
"productivity". When persons, by their intentional actions, use things
to create a certain product, then both the persons and things are
productive or causally efficacious in the production of the product.

But only the persons incur the responsibility for the product since things are without responsible capacity. The point is that, instead of the things being responsible for the product, the persons are _also_ responsible for using the things, i.e., for using up those services of the things. Thus the actions of the responsible agents are responsible not only for creating the product (typically assets) but also for using up the services of the merely productive agents (i.e., for creating those liabilities). Since "responsible actions" play a distinguished role vis-a-vis "merely productive services", we will use a formalism which (unlike production functions) incorporates that distinction. The following formalism is a simplification and adaptation of control theoretic concepts.

Let "$\leq$" denote the natural partial ordering of vectors induced by the component-wise orderings (i.e., $(u_i) \leq (v_i)$ if and only if $u_i \leq v_i$ for all $i = 1,\ldots,n$) and let $0 = (0,\ldots,0)$ by the n-dimensional zero vector. With a party (i.e., each person or group of persons acting jointly as in a household or firm), we associate a _commodity space_ S consisting of all the party's possible holdings of asset vectors $X = (x_1,\ldots,x_n)$ where $0 \leq X$. An _action space_ A of possible "actions" or "operators" is also associated with each party. A party has an _input-output function_ $\varphi : A \times S \longrightarrow S$ which specifies how an action $\alpha \in A$ acts on an _input vector_ $X \in S$ to yield an _output vector_ $Z = \varphi(\alpha; X) \in S$. The action α _creates_ (the vector which is) the difference between the output vector $Z = \varphi(\alpha; X)$ and the input vector X, i.e., $Y = Z - X = \varphi(\alpha; X) - X$. That resultant vector Y is a vector of assets and liabilities called an _input-output vector_. The distinction between responsible actions and productive (but not responsible) services is expressed by the distinction between the

action space A and the commodity space S. We will say that, by the action α, the party is <u>responsible</u> for creating the assets and liabilities in the input-output vector $Y = Z - X = (y_1,\ldots,y_n)$. The vector of <u>created</u> <u>assets</u> is the vector $Y^+ = (y_i^+)$ where $y_i^+ = \max(y_i,0)$ for $i = 1,\ldots,n$. The vector of <u>used</u> <u>up</u> <u>assets</u> is the vector $Y^- = (y_i^-)$ where $y_i^- = \max(-y_i,0)$ for $i = 1,\ldots,n$. Then $0 \le Y^- \le X$, $0 \le Y^+ \le Z = \varphi(\alpha;X)$, and $Y = Y^+ - Y^-$. In the usual models of consumption and production, it is customary to represent only the commodities created or used up by the activities. That is, the vector $X - Y^- = Z - Y^+$ of assets unaffected by the activity is usually taken to be the zero vector, and we will follow that convention. For example, if the party is a household which purchases a vector of commodities X and consumes it (i.e., performs an action α transforming X into 0), then $X = Y^- = -Y$ and $Z = \varphi(\alpha;X) = 0 = Y^+$.

LAISSEZ FAIRE APPROPRIATION

Property appropriation has been largely neglected in the theoretical literature of law and political economy. The orthodox view seems to be that there is only a legal assignment of ownership rights when some ownerless entity is claimed from nature or in peripheral cases where ill-defined property rights need to be specified. Hence it is believed that most "appropriation" took place long ago (as in the Lockean myth of an original state of society), and that there is only the <u>transfer</u> of property rights in an established and on-going property system.

The legal mechanism for the voluntary transfer of property rights is the system of contracts (in particular, sale contracts where the rental of an entity is construed as the sale of certain services yielded by the entity). A party can transform some commodities into other commodities by market transfer contracts. In the example of the

B to A transfer of X and the A to B transfer of Z, the party B trans-
formed X into Z by transfer contracts. In recognizing and validating
the exchange contracts, the legal system terminates B's ownership of
X by transferring it to A and initiates B's ownership of Z by trans-
ferring it from A.

There is <u>another</u> way that a party can transform some commodities
into other commodities, e.g., transform X into Z, which does not
involve transfers between parties. That is, a party can transform
X into Z by action, instead of by transfer. That is why an on-going
property system inherently involves the appropriation as well as the
transfer of property (i.e., of assets and liabilities). Thus, in
addition to the legal machinery of voluntary exchange contracts, there
must be some legal mechanism whereby a party's ownership of the
used up assets X is terminated (but not by transferring it to another
party) and whereby the party's ownership of the created assets Z is
initiated (but not by transferring it from another party). In terms
of assets and liabilities, a party can acquire a vector $Y = Z - X$
by transfer or by creation. If the voluntary exchange contract is
the legal transfer device, what is the legal means of appropriation,
i.e., of imputing the legal responsibility for the creation of Y?

An example of the imputation of legal responsibility in accordance
with de facto responsibility would be a civil or criminal trial where
a jury or judge makes a decision as to whether or not a designated
party is the de facto responsible for a given tort or crime ("guilty
or not guilty"). If a legal authority had to make such an explicit
imputation every time that (say) a consumer intentionally destroyed
a commodity by consuming it, then the property system would clearly
be unworkable. But the interesting and important fact is that there
is a <u>laissez faire solution</u> which allows the legal system to restrict

explicit imputations to illegal activities.

Suppose that a party performs an action α which uses up the commodities X. That party, by the action α, is de facto responsible for creating the liabilities -X, so, in principle, that party is to have the legal responsibility for those liabilities. If the party is already the owner of the assets X, then the laissez faire legal policy of "letting the chips lay where they have fallen" would be correct (i.e., in accord with the responsibility principle). Suppose that the law had intervened and made an explicit imputation in the form of a property damage suit. The legal liability for using up X was assigned to the defendant (who was de facto responsible for creating the liability -X), and a compensatory damage payment was enforced from the defendant to the plaintiff (the owner of X). But the party de facto responsible for creating -X was, by assumption, the owner of X, so the defendant and the plaintiff are the same party, and thus that party would pay itself the damage payment. The point of this hypothetical explicit legal imputation is that exactly the same result would be obtained if the law did nothing - if the law "let it be". That is the basic idea of the laissez faire mechanism of appropriation or imputation. Since the party de facto responsible for using up the assets is already their owner, the law's inaction is, in effect, a correct implicit imputation of legal responsibility - as if by an 'invisible judge'.

A party's action might not only use up a vector of assets $X = Y^-$ but create a (non-zero) vector of assets $Z = Y^+$. Since the party is, by its action, de facto responsible for creating both -X and Z (i.e., for creating $Y = Z - X = Y^+ - Y^-$), the two vectors could not consistentl be imputed to different parties. If a party owned X and thus laissez

faire appropriated the liabilities -X, then the law would sanction the
X owner's claim on the assets Z (unless the law intervened to explicitly
impute both -X and Z to another party). Loosely speaking, the owner
of the input vector X "pays the costs" so he has a legally defensible
claim on the (appropriable) "benefits" (unless the costs are also
reassigned). In principle, the appropriator of $Y = Z - X$ is to be
the responsible party, i.e., the party which performed the responsible
action that transformed X into Z. The laissez faire mechanism of
appropriation imputes the input-output vector Y to the owner of X.
Thus the laissez faire mechanism functions correctly in principle if
the input owner is the responsible party.

A party can legally transform a property holding X into Z in two
ways: (1) by exchange with other parties, or (2) by action (consumption
or production). That is, a vector of assets and liabilities $Y = Z - X$
can be acquired by transfer or appropriation. In the normal operation
of the property system, assets and liabilities are legally appropriated
and legally transferred without any legal commands or judgments. There
are laissez faire (L-F) mechanisms of transfer and appropriation. The
L-F mechanism of transferring property without legal command is
voluntary contractual exchange. The L-F mechanism of property appro-
priation is that of assigning the liability for used up assets by
"letting the chips lay where they have fallen", and then letting the
party which "bears the costs" claim the created assets.

We have seen that a private property market economy incorporates
a laissez faire property mechanism (for the appropriation and transfer
of property) which functions in tandem with the laissez faire price
mechanism. Prices guide the decisions made by parties concerning
which transformations of property will be made in production, exchange,

and consumption. The property mechanism governs the changes in property rights (appropriations and transfers) which result from the chosen production, consumption, and exchange activities. The laissez faire price mechanism can malfunction, and that may prompt governmental intervention. The L-F property mechanism can also malfunction, and the legal interventions to correct and compensate for such malfunctions constitute a significant part of the activities of the legal system. Voluntary contracts can be fraudulent, mistaken, breached, etc., and a party other than the owner of certain assets can be de facto responsible for taking or using up the assets without any voluntary transfer on the part of the owner (e.g., theft, conversion, torts involving property damage, etc.).

What sort of insurance is there that the L-F mechanism of appropriation will function correctly (when the law does not intervene)? The basic theoretical principle, which supports the mechanism, is that the proper functioning of the contractual transfer mechanism will maintain the correspondence between de facto possession and control of a commodity vector X and its legal ownership, so that when a party is de facto responsible for using up X, it could only be the owner. That is, if the only factual transfers of commodities are voluntary legal transfers (no thefts or conversions) and if all voluntary contractual transfers of commodity ownership are fulfilled by the corresponding factual transfers (no breached, fraudulent, or mistaken contracts), then the party that uses up X must be its owner.

It should be noted that when a party uses property owned by another party, then the commodities X thereby used up are certain services of the property. If the property owner consents to such usage (e.g., in a loan or rental of the property), then those property-services X have been legally transferred to the user -

so the user _is_ the owner of the commodities _used up_. On the other
hand, if the property owner did not consent to the transfer of the
services X, then the party responsible for using up X would not be
the X owner, and the owner's L-F appropriation of the liabilities
-X would be incorrect. But that would also be an illegality (e.g.,
conversion) prompting legal intervention (at the X owner's request)
to set aside the laissez faire solution by explicitly imputing the
legal responsibility for creating -X (using up X) to the de facto
responsible party, and by enforcing a compensatory damage payment
to the X owner. It is 'as if' the borderline between a legal activity
(where the law "lets it be") and an illegal activity is structured so
that when a laissez faire imputation of the 'invisible judge' is in
error, then it would be an illegality and thus legal grounds would
exist for the intervention of a (visible) judge who could overrule
the laissez faire 'decision'.

Pathology illuminates the otherwise invisible properties of health.
The explicit content of the law's action in the case of an illegality
(the imputation of legal responsibility in accordance with de facto
responsibility) reveals the implicit content of the law's inaction in
the case of legal activities. However, the 'invisibility' of the
laissez faire 'judge' has evidently led to the view that only the
transfer - and not the appropriation - of property is involved in an
on-going private property market economy. It also seems to have
fostered the view that the imputation of legal responsibility in
accordance with de facto responsibility is somehow only applicable
to illegal activities. The point is that only illegal activities
generally require an _explicit_ application of the responsibility
principle by a legal authority. The responsibility principle is the
paradigm norm of legal imputation as well as the basic principle of

private property appropriation (assets and liabilities), but a private
property system would be impractical if a (visible) judge or jury had
to make a decision about de facto responsibility every time a commodity
was consumed or produced. The view that the ordinary canons of legal
responsibility are only applicable to illegalities is just as incorrect
as the view that the principle of increasing some people's welfare
without hurting others is only applicable when the 'visible hand' of
the government intervenes into the laissez faire price mechanism to
correct inefficiencies due to externalities or other market failures.

We have restricted attention to the canonical case where assets
are produced or used up as the result of intentional activities (e.g.,
production and consumption) so that there is a de facto responsible
party. There are, of course, many cases where assets are created and
destroyed solely as the result of natural forces so that there would
be no responsible party. While the laissez faire mechanism of appro-
priation would still 'operate', the responsibility principle would
not apply. In many applications involving human activities, it may
still be difficult to clearly delimit a responsible party. This
seems true, for example, in the case of many externalities where
certain assets X are destroyed. It might also happen that there is
a party clearly responsible for destroying X, but that there is no
clearly defined property right to those assets (e.g., quietness,
unobstructed views, air currents, etc.). But when one party is de
facto responsible for destroying assets X owned by another party,
then that "ownership externality"[1] causes a malfunction in the L-F
price mechanism, i.e., inefficiency, as well as a malfunction in the
L-F property mechanism of appropriation, i.e., the misimputation of
the liabilities -X to the X owner instead of to the responsible party.

1. Francis M. Bator, "The Anatomy of Market Failure", The Quarterly
   Journal of Economics, LXXII (August, 1958), 363.

Contrary to the exclusively price theoretical (i.e., narrowly "economic") analysis of R. H. Coase,[2] the task of the legal system is to correct $\underline{both}$ malfunctions.

APPROPRIATION IN THE THEORY OF THE FIRM

The most important and controversial example of property appropriation in political economy is that which occurs in production. It lies at the heart of the so-called "distribution" problem. The assets used up and the assets created in a firm during a given time period are respectively the inputs and outputs of the firm. The vector $Y = (y_1, \ldots, y_n)$, which lists the quantities of the outputs as the positive components and minus the quantities of the inputs as the negative components, is the $\underline{\text{input-output vector}}$ of the firm. Since the vector $Y = (+Y^+) + (-Y^-)$ includes $\underline{both}$ the assets and the liabilities created in production, i.e., the $\underline{\text{positive product}}$ $+Y^+$ as well as the $\underline{\text{negative}}$ product $-Y^-$, we will also call it the $\underline{\text{whole product vector}}$.

Conventional economic theory employs the metaphor that the input suppliers have "claims" on the product and that, after they receive their "distributive share", some party is the "claimant" of the remaining "residual". But that is $\underline{only}$ a metaphor. One accurate description of the structure of property rights in a firm would better serve the scientific purposes of political economy than any number of price theoretical metaphors. There is no such "distribution" of the ownership of the outputs. One party owns $\underline{all}$ the outputs, i.e., all of the created assets or positive product Y^+. Price theorists evidently are prone to deny or ignore that undivided and undistributed ownership of the outputs because of the payments made to the input suppliers. But the difficulty lies in the preconception that the firm's positive product Y^+ is the only "product" that might be legally held by the

2. R.H. Coase, "The Problem of Social Cost", $\underline{\text{The Journal of Law and}}$ $\underline{\text{Economics}}$, III (October, 1960), 1-44.

parties. That preconception overlooks the negative product, i.e., the input liabilities $-Y^-$. The point is that the party which owns all the output assets Y^+ <u>also</u> holds all the input liabilities $-Y^-$. Instead of there being any ownership distribution, one party has the undivided ownership of the whole product vector $Y = (+Y^+) + (-Y^-)$.

Furthermore, the assets and liabilities in the whole product vector Y are not transferred to that party from other parties. That party is the <u>initial</u> <u>owner</u> or <u>appropriator</u> of the whole product. The whole product appropriator is the initial party in the forward chain of legal transfers of the output assets Y^+ as well as the terminal party in the forward chain of legal transfers of the input assets Y^- (i.e., the initial party in the backward chain of legal transfers of the input liabilities $-Y^-$).

The product-sharing metaphor seems to be motivated by marginal productivity theory. Consider a competitive profit-maximizing firm with a production function $y = f(x_1,...,x_n)$. Let $Y^0 = (y^0, -x_1^0, ..., -x_n^0)$ be the input-output vector which maximizes $P \cdot Y$, where $P = (p, p_1, ..., p_n)$ is the market price vector and $Y = (f(x_1, ..., x_n), -x_1, ..., -x_n)$. The first order conditions are $pf_i = p_i$, where $f_i = \partial f(x_1^0, ..., x_n^0)/\partial x_i$ for $i = 1,...,n$. Multiplying each side by x_i^0, we see that the <u>market</u> <u>value</u> of $f_i x_i^0$ units of output is the same as the <u>market</u> <u>value</u> of x_i^0 units of the ith input, but the <u>ownership</u> <u>rights</u> to the two assets are quite distinct. What the input suppliers do own - namely x_i^0 - is equal in value to $f_i x_i^0$ units of output, but they do not also own that "share" or any part of the outputs. The party which does appropriate all the outputs y^0 also appropriates the liability $-x_i^0$ and transfers it to the input suppliers by purchasing the asset x_i^0. When the input suppliers are thus paid the purchase price $p_i x_i^0$, some economists are evidently motivated to describe that ordinary market transaction with

the metaphor that it is "as if" the input suppliers had "claimed" and sold their "distributive share of the product", i.e., the equal valued $f_i x_i^o$ units of output. Similarly, what the whole product appropriator does appropriate, namely Y^o, is equal in market value to $y^o - \sum_{i=1}^{n} f_i x_i^o$ units of output, but that party owns not only that "residual share" of the outputs but <u>all</u> the output assets $Y^{o+} = (y^o, 0, \dots, 0)$ as well as all the input liabilities $-Y^{o-} = (0, -x_1^o, \dots, -x_n^o)$. Furthermore, the <u>mere</u> (marginal) <u>productivity</u> of inputs does not account for any owner-ship claims on the outputs, and that agrees with the above mentioned fact that the input suppliers have no claims on a share of the outputs to "account for" in the first place. It is the appropriation of all the output assets and input liabilities which needs to be accounted for, and it is de facto <u>responsibility</u> - not productivity - which, in principle, accounts for the appropriation of the liabilities and assets created by using up the inputs to produce the outputs.

A firm, as a legal party, is usually a proprietorship, a partner-ship, or a corporation, and in each case, it is <u>that</u> legal party which legally appropriates the input-output or whole product vector of the enterprise. To put the matter abstractly, the party which appropriates the whole product of a firm is the party which would be identified with the firm itself, when the firm is considered as a legal party rather than just a productive organization. Hence, we will refer to the party which appropriates the whole product of a firm simply as the 'firm'.

The product-sharing metaphor also fails to give a coherent account of the fact that the 'firm' has the discretionary control right over the production activities. Since the 'firm' appropriates all the input liabilities $-Y^-$, the 'firm' must be the last buyer and terminal owner of all the input assets Y^-. Since any party has the legal right to control its use of its property, the 'firm', as the owner of the

inputs Y^- being used up, has the sole legal right to control and manage that usage.

Since the 'firm' owns 100 per cent of the output assets, holds 100 per cent of the input liabilities, and has 100 per cent of the discretionary legal control over production, it is clear that the 'firm' (i.e., the whole product appropriator) has a central and rather asymmetrical role vis-a-vis the other parties which only supply inputs. There seems to be no scientific reason why that role of the 'firm' should be misleadingly presented as only a claim to the residual (by using the 'product-sharing parable'), and then the residual assumed to be zero (e.g., constant returns to scale) in an attempt to portray all the parties in symmetrical roles. That approach essentially leaves the 'firm' out of the theory of the firm.

Since there is no distribution of the product ownership (except in a metaphorical sense), the "problem of distribution" is an ill-posed problem which requires reformulation. The problem splits into a price theoretical component, concerned with the determination of the market price vector P, and a property theoretical component concerned with the determination of the initial ownership of the input-output vector $Y = (+Y^+) + (-Y^-)$. The past appropriation of the input assets $+Y^-$ and the future appropriation of the output liabilities $-Y^+$ takes place in production and consumption activities that are (by assumption) outside of the given productive activity (which creates $Y = Y^+ - Y^-$). Since similar considerations apply to those activities, we may restrict the property theoretic analysis to the appropriation of the input-output vector of the given firm. Neoclassical economic theory focuses of the determination of the price vector, i.e., on price theory. But neoclassical economics does not formulate the central question; "Which party is to appropriate the input-output vector of a firm?", i.e.,

"Who is to be the 'firm'?".

When the question is asked, it usually elicits such answers as "the owners of the instruments or means of production" or "the owners of the firm". The first answer is insufficient, because if the "instruments of production" (e.g., capital or natural resources) are rented, leased, or borrowed, then their owners are only input suppliers. The first answer might thus be rephrased as "the owners of the services of the instruments or means of production". That answer is insufficient if those services only form a proper part X_1 of the input vector X. Suppose that another party owns the other inputs $X_2 = X - X_1 \neq 0$ (so $X_1 + X_2 = X = Y^-$). The X_1 owner might "claim" the right to discretionary control over the production process on the basis of the ownership of X_1, but that "claim" is incorrect and even contradictory. Since X_1 and X_2 are 'mixed' and 'intermingled' in the production process, the discretionary control over the use of X_1 would imply discretionary control over the use of X_2 and thus contra-dict the symmetrical "claim" of the X_2 owner. Each of the symmetrical property owners can only consistently have: (1) the discretionary control right over his use of his property when that does not imply the same control over the property of others, and (2) the right to veto (i.e., veto control over) the use of his property by others. In order to have the discretionary control right (i.e., the right to management) over the production process, a party which owned some of the inputs would have to buy out the other input owners.

Hence, in order to be plausible, the proposed answer needs to be amended as "the owners of the capital funds used to buy all the inputs X", i.e., "the party which owns all the inputs X". Similarly, the loose expression "the owners of the firm" can only boil down, upon analysis, to mean the party which owns the input vector X. For example,

the collectivity of the stockholders of a corporation (i.e., "the owners of the corporation") own the capital funds which (instead of being loaned out) are used to purchase all the inputs, so that party owns all the input assets X. Hence, it seems safe to take the standard answer to the question "Which party is to appropriate the input-output vector $Y = (+Y^+) + (-Y^-)$?" to be: "the party which has purchased and owns all the input assets $X = Y^-$".

The standard answer is insufficient. The ownership of the assets $X = Y^-$ and the appropriation of the liabilities $-X = -Y^-$ are as distinct and different as the plaintiff and defendant in a suit for property damages. For example, suppose that one party owned the assets X but that another party took the assets and destroyed or otherwise used them up. In a damage suit, the law would impute the legal responsibility for creating $-X$ not to the X owner but to the de facto responsible party. The ownership of the assets X <u>only</u> determines the identity of the party that is the plaintiff - not the identity of the defendant. The X ownership only determines to whom the responsible party is liable, i.e., who receives the compensatory damage payment. The example quite simply illustrates the insufficiency of the answers: "the owners of all the input assets", "the owners of the firm", "the owners of the means of production", and so forth. The example also involves an illegality which justifies the law's intervention and the explicit imputation of legal responsibility.

Here is where the laissez faire mechanism of appropriation plays a decisive role. We have already noted the impracticality of the explicit legal implementation of the responsibility principle whenever commodities are used up or produced, and hence the practical necessity of the laissez faire mechanism in a private property system. The

laissez faire mechanism utilizes a surrogate criterion of imputation
as an operational substitute for the theoretical criterion of imputation
i.e., de facto responsibility. The L-F surrogate criterion is precisely
the ownership of the vector of input assets or used up assets $X = Y^-$.
The surrogate criterion of imputation functions correctly if and only
if the asset owner (i.e., the plaintiff in a hypothetical property
damage suit) is the same party as the party de facto responsible for
creating the corresponding liability (i.e., the responsible defendant).
While it is not theoretically sufficient to be the party owning all the
inputs X, it is exactly that party which satisfies the laissez faire
surrogate criterion of imputation. Hence, within the scope of the
laissez faire mechanism of appropriation, the party which owns all the
used up inputs $X = Y^-$ legally appropriates the input-output vector
$Y = (+Y^+) + (-Y^-)$ of the firm. It remains to check the correctness
of the laissez faire imputation, i.e., to identify the party de facto
responsible for using up the inputs to produce the outputs. It is a
question of fact.

THE HIRED LABOR SYSTEM AND THE SELF-MANAGEMENT SYSTEM

The group of people who jointly perform the de facto responsible
actions, which use up the inputs Y^- to produce the outputs Y^+ of a
firm, is the group consisting of all the people (blue-collar, white-
collar, etc.) who work in the firm. We will refer to that party as
the working community of the firm. Since that party is de facto
responsible for creating the input-output vector Y, the working
community of a firm is, in principle, to be the 'firm'. The system
of production, where the working community of each firm appropriates
its whole product and democratically controls its productive activities
(i.e., where the people who work in each firm are the 'firm'), is the

system called _self-management_ (also known as labor-management, laborism, or workers' management).

In the present-day system of production, the de facto responsible party in a firm, i.e., the working community, is _not_ the party which legally appropriates the input-output vector (except for a handful of cases). How can that happen? There is a very simple way that the L-F surrogate criterion of imputation can be abused causing the laissez faire mechanism to misimpute the input-output vector to a party different from the de facto responsible party. Simply treat de facto responsible human action itself as an input commodity and create a special contract for the legal transfer of the ownership of that peculiar commodity. Then any party with sufficient capital can buy the 'input', responsible human action (i.e., labor), as well as the usual input commodities, and thereby acquire the legal role of "owner of all the input assets". Thus, any party with sufficient capital can satisfy the _surrogate_ criterion of imputation and legally appropriate the whole product of a firm, even though the party de facto responsible for creating the whole product is still the working community of the firm. That, in brief, is the modus operandi of the _hired labor system_ (also known as capitalism).

To formally develop the analysis, it is sufficient to consider a simple model of a firm where (during a given time period) the responsible agents working in the firm perform the actions L which use up K units of services of the merely productive agents (capital) to produce $Q = f(L, K)$ units of output. The same 'technological' information plus the distinction between responsible and merely productive agents can be expressed by an input-output function $\varphi : A \times S \longrightarrow S$ where $\varphi(L; (K, 0)) = (0, Q)$. The labor L is taken to include the work of _all_ those who work in the firm regardless of

their legal role. The working community, by the labor L, is de facto responsible for creating the assets and liabilities in the whole product vector $Y = \varphi(L;(K,0)) - (K,0) = (0,Q) - (K,0) = (-K,Q)$. If the working community of the firm purchased the capital services K (i.e., rented the capital), then the working community, as owner of the input vector $Y^- = (K,0)$, would laissez faire appropriate the whole product $Y = (-K,Q)$. Then the party responsible for creating Y would also appropriate Y and would be the 'firm'. The firm would be self-managed.

The hired labor system is characterized by the law's validation of the contract for the rental of persons, i.e., the contract for the sale of human actions, which is variously called the employer-employee, master-servant, employment, or, simply, labor contract. In order to represent the legal treatment of labor as a transferable commodity, we will augment the commodity vectors to allow for a labor component. This augmentation, for the purpose of formally analyzing the hired labor system, changes the conception of the input, the output, and the input-output vectors. They are now respectively $X = (L,K,0)$, $Z = (0,0,Q)$, and $Y = Z - X = (-L,-K,Q)$. The working community's performance of L, which creates $(-K,Q)$, would now be represented as the creation of $(L,0,0)$ and $(-L,-K,Q)$ which vectorially sum to $Y^* = (0,-K,Q)$, i.e., the augmented or three dimensional version of $(-K,Q)$. In the new notation, the basic fact about responsibility (noted above) is that the working community is de facto responsible for creating $Y^* = (0,-K,Q) = (L,0,0) + (-L,-K,Q)$.

In the hired labor system, the members of the working community are legally viewed as only the original owners of the commodity labor. A self-managed firm, within the hired labor system, would be legally viewed as a case where the 'L owners' (the working community) bought

the other input K, and then, qua owners of all the inputs $X = (L,K,0)$, laissez faire appropriated the input-output or whole product vector $Y = (-L,-K,Q)$. It should be noted that the working community would legally appropriate Y, not because it was responsible for creating Y, but solely because it satisfied the laissez faire surrogate criterion of imputation, i.e., input ownership.

The legal validation of the labor contract creates the legal possibility of a non-self-managed firm. The K owners can, by the labor contract, purchase L, and then, qua owners of all the inputs $X = (L,K,0)$, laissez faire appropriate the input-putput vector $Y = (-L,-K,Q)$. That is, since the "employer" owned the input assets $Y^- = X = (L,K,0)$, then, within the scope of the laissez faire property mechanism, the employer would bear the input liabilities $-Y^- = -X = (-L,-K,0)$ and thus have the legally defensible claim on the output assets $Y^+ = (0,0,Q)$. The difficulty in the hired labor firm is that the change in the "legal ownership" of the "commodity" labor does not change the de facto responsible nature of human action. The firm's working community as a whole (which may include working employers) is still jointly de facto responsible for creating $Y = (-L,-K,Q)$ (as well as L), but the party which legally owns the input assets $Y^- = X$ (e.g., the collectivity of the stockholders of a corporation) legally appropriates Y. The working community is, regardless of the legalistic superstructure, de facto responsible for creating $Y^* = (0,-K,Q)$, but the labor contract, in effect, decomposes that vector into a paid for part $(L,0,0)$ and an unpaid for part $(-L,-K,Q)$. The owners of K can pay for the one part $(L,0,0)$ and then additionally acquire the ownership of the other part $Y = (-L,-K,Q)$ (by L-F appropriation) without paying for it and without being responsible for creating it. The hired labor firm thus inherently involves the misimputation of the

input-output vector Y as well as the misidentification of the party that is to be the 'firm'.

The labor contract induces the malfunction in the L-F appropriation mechanism, i.e., the divergence between the surrogate and the theoretical criteria of imputation. As noted before, the appropriation mechanism depends on the proper functioning of the contractual mechanism. When an input owner purchased the input commodities, those transfer contracts would be fulfilled by the factual transfer of the possession and control of the inputs to that party so that it could be solely de facto responsible for using up the inputs. If the input purchase contracts are thus fulfilled and there are no further factual transfers, then the input owner and only that party can be de facto responsible for using up the inputs. That, in brief, is the 'inner logic' of the L-F property mechanism. The services of things (e.g., machines, tools, and other materiel) _can_ be factually transferred from seller to buyer so that the buyer can be solely responsible for using up those services to obtain certain results. Things are interpersonally transferable. But persons are not. The services of a person _cannot_ be factually transferred from the 'seller' to the 'buyer' so that the 'buyer' can be solely de facto responsible for using those services and for the results. People can at most voluntarily co-operate and collaborate with other people, but then they are jointly de facto responsible for the results of their actions. Coercion is the only way that a person can be employed and not be de facto responsible for the results of his behavior - but that is not voluntary.

There is in fact no such thing as the voluntary transfer of labor. Yet, it is precisely that performance which is required to fulfill the voluntary contract for the legal transfer (sale) of labor, i.e., the labor contract. The labor contract cannot be fulfilled. It is

therefore an _invalid_ contract (by the standard principle of contractual
jurisprudence called "impossibility of performance"). In fact, the
labor contract is _mistaken_ in its very conception - the assumption
that human actions are transferable commodities. The reason for the
invalidity of the labor or self-rental contract applies a fortiori to
the self-sale or self-enslavement contract, but the voluntary self-sale
contract is already legally recognized as being an invalid contract.

Just as the self-sale contract was nevertheless legally validated
in slavery systems, the law - in the hired labor system - legally
validates the labor contract and accepts a _surrogate performance_
(other than the voluntary transfer of labor) in fulfillment of the
labor contract. Since the "employees" cannot in fact voluntarily
turn themselves over to be "employed", as irresponsible human tools,
by the "employer", the law accepts the 'next best thing' as a surro-
gate performance in fulfillment of the employment contract - namely,
the voluntary and obedient co-operation of the employees with the
employer (within the scope of their employment). Thus, in spite of
the labor contract, all the people who work in a firm (i.e., employees
and working employers) are jointly de facto responsible for using up
the inputs to produce the outputs.

The analysis and critique of the labor contract rests squarely
on the factual assertion about the factual non-transferability or
inalienability of labor and thus the joint de facto responsibility
of the working community of any firm for the input-output vector.
Those basic facts, which might be referred to as "the non-transfer-
ability of labor", are evidently not controversial. The legal system
itself fully agrees. In order to verify this, simply consider a
case where the law intervenes (thus setting aside the L-F mechanism
of appropriation and its surrogate criterion) to explicitly recognize

the facts about responsibility, e.g., consider an illegal activity performed by employees in accordance with their employer's instructions. When the law attends directly to the facts, then the legalized misrepresentation of the facts - the labor contract - is essentially ignored and the de facto responsible nature of the employees' actions is acknowledged. The legal responsibility for the results of a criminal activity is assigned to all those who co-operatively performed the activity. The "employees" in work become partners in crime.

> All who participate in a crime with a guilty intent are liable
> to punishment. A master and servant who so participate in a
> crime are liable criminally, not because they are master and
> servant, but because they jointly carried out a criminal
> venture and are both criminous.[3]

When the "venture" being "jointly carried out" is not illegal, then naturally the de facto responsible nature of employee actions does not change. It is the response of the legal system which changes. Since the activity is legal, the law does not intervene and the laissez faire property mechanism, with its surrogate criterion of imputation, takes over and malfunctions by virtue of the legally validated labor contract.

This analysis of the hired labor system is couched in terms of property theory and contract theory (the creation and transfer of quantity vectors of assets and liabilities) - not price theory. Price vectors were peripherally mentioned, but not used in the analysis. Price theory cannot answer the central question about the organization of production and 'distribution' - namely, "which party is to appropriate the input-output vector of a firm?", or briefly, "Who is to be the 'firm'?". However, a market price vector $P = (w,r,p)$ can be introduced and used to express the results of property theoretic

3. Francis Batt, The Law of Master and Servant, fifth edition by
   George Webber (London: Pitman, 1967), p. 612.

analysis in value terms. The working community factually creates and transfers the liabilities and assets $Y^* = (0,-K,Q)$ to the employer, i.e., the working community receives +K from the employer (or, equivalently, transfers -K to the employer), uses up +K (creates -K) in the production of +Q, and transfers +Q to the employer (or sells Q in the employer's name). It should be noted that, in accordance with the analysis of the labor contract, the labor L is both created and used up by the working community, and is not factually 'transferred' to the employer (i.e., does not appear in the vector Y^* factually transferred to the employer). In value terms, the working community is de facto responsible for creating the value $P \cdot Y^* = (w,r,p) \cdot (0,-K,Q)$ $= pQ - rK$ and transferring it to the employer. But the working community's performance is legally misrepresented as only the creation and transfer of $(L,0,0)$, so the employer only pays $(w,r,p,) \cdot (L,0,0) =$ wL in return. As in any misrepresented or fraudulent contract where a party acquires the ownership of one thing, e.g., $(0,-K,Q) =$ $(-L,-K,Q) + (L,0,0)$ valued at $pQ - rK$, but pays for something else, e.g., $(L,0,0)$ valued at wL, the party nets the difference in value, e.g., $pQ - rK - wL$. That 'surplus' value $P \cdot Y = (w,r,p,) \cdot (-L,-K,Q) =$ $pQ - rK - wL$ is the value of the unpaid for part Y of what the working community created (which is laissez faire misappropriated by the employer), and that value is usually called the "profits".

The hired labor system (i.e., capitalist production) is customarily considered, by both advocates and critics alike, to be consistent with, if not necessitated by, the institutions of private property and volunta contract. However, we have seen that the system is based on the legal 'validation' of an invalid contract - the labor or person rental contract. That violation of the contract institutions in turn allows

one party to legally appropriate property (e.g., Y) which another

party is de facto responsible for creating - in violation of the

basic principle of private property appropriation. In short, the

'peculiar institution' of renting people, i.e., the hired labor or

capitalist system of production, stands in direct contradiction

with the institutions of private property and voluntary contract.

The system of production, that is necessitated by the institutions

of private property and voluntary contract, is the system of

self-management.[4]

---

4. The standard economic analysis of a self-managed market economy
    is developed in: Jaroslav Vanek, The General Theory of Labor-
    Managed Market Economies, Ithaca: Cornell University Press, 1970.