Welfare Economics and the Vita Theory

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I. Introduction

A useful welfare economics died giving birth to Pareto optimality.1 However, the elegance associated with the most refined version of general equilibrium theory seems to assure optimality's life after death. Nonetheless, a theory that treats the functional distribution of income as given and the personal distribution as nonexistent cannot draw robust conclusions regarding a fundamental welfare issue, namely the equity of the personal income distribution.

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Pareto's optimality optimum is Pareto optimality as currently understood by economists. Inequality assumes: (a) want-satisfaction is a function only of present production and process; (b) individuals' want-satisfactions are independent; (c) preferences are revealed only in a market; (d) individual preferences are given; and (e) property and human capital distribution is given rather than determined (see Tavasci, [23, 20]). On the other hand, Pareto's socialistic definition of utility from his The Mind and Society has been discussed by Tavasci as "a social concept, deriving from ethical, moral, religious, political, etc., as well as economic causes" ([23, 7]). This conception would lead to the broader interpretation of utility used in this article. Harsanyi [21, 21] as well as others mistakenly equate Pareto's optimality with Pareto's utility.

In this article I argue that the faults in traditional welfare optima go beyond the tendency to use optimality in a futile effort to avoid the ethics of distribution. First there must be a theory of the personal income distribution. In order to avoid the treatment of labor as just another commodity, I use a human developmental or anthropogeographic model that describes the process of cumulative acquisition of competences or credentials over time. Traditional human capital theory, an approach that relies too strongly on static exchange optima and that continues to treat labor as an abstraction, is modified by integrating individuals into the labor supply in stages over time. These stages are benchmarks in the labor market vitae of persons and hence the term, vita theory. The vita theory of the personal income distribution itself has been developed in greater detail elsewhere [7]. In the present article a vita theory of the labor market is used to highlight the true nature of welfare optima as well as to show the requirements of any new welfare economics approach.

The focus of the vita theory is on the ways in which persons are able to increase their options in seeking higher incomes over a lifespan. Once those variables over which individuals have personal control are identified, it is clear that some individuals have far more options than others. Then, the goal of a welfare economics is to identify the constraints and to judge whether and how they can be eliminated. In other words, the distant peak of a utility mountain is of little
relevance to those confined to the initial base
by those persons that enable persons to
the preferred destination.

The equity which the options or the
endowments that provide the options are
distributed becomes a legitimate equity for
welfare economics. Problems of equity — espe-
cially distributions at birth — take economists
into a terrain of collective choice and ethics
that must rather leave to others. As I show,
however, because utility functions are
interdependent in reality, only a homogen-
izing force such as an ethic can leave persons
otherwise satisfied with unequal marginal
utility conditions. Among those to whom
students have relinquished equity prin-
iciples is philosopher John Rawls. It thus
seems appropriate to appraise the Rawlsian
difference principles within the construct of the vita
theory modified through its merger with
interdependent utility functions. Whether one
agrees with Rawls, he has forced the equity
issue into the open. When economists come
collide with the ethics closet they find themselves
again confronted with utilitarianism, an ethi-
cal system from which they have been retreat-
ing during the past century.

II. The Vita Theory of the Personal
Income Distribution Robes.

The purpose of this section is to provide a
summary of the vita theory.1 Its main thrust
can be simply stated. Assume that one labor
market exists for each general human capital
classification. The individual's quantity of
human capital determines which labor mar-
ket the person enters. A person "qualifies" for
a particular labor market by the state of his or
her health and "characteristics" at that point in time. Determination of
vita begins at birth when one's race, sex,
religion, national origin, inherent mental and
physical capacity, inheritances, and family
background are duly noted.

The vita is "added to" over one's lifespan
by education, other training, and experience.
The individual has some control over the
"length" and "depth" of his or her vita. Since
labor demand is related to product prices and
a changing technology, however, only the rate
individual can predict with any accuracy the
derived demand for workers with vita of his
or her type. Moreover, specific labor supply
conditions are a collective consequence
outside personal control. Then, given one's
vita and the characteristics of the applicable
labor market, as a first approximation, the
individual's basic wage rate depends on the
wage of central tendency for such labor
services. Upon further approximation, how-
ever, the individual's personal income exhibits
differentials from potential labor market
earnings. The differentials — occupational,
geographic, inter-industry, union-nonunion,
discriminatory, and so on — often can be
traced back to the first vita stage, which I call
the birth vita.

The pre-career vita retains the initial char-
acteristics at birth and includes education and
"first-time" on-the-job training. The nurture
vita that also carries work experience is the
labor-market vita. The individual confronts a
large number of homogenous and, thus,
noncompeting labor markets in which each
exhibits a wage of central tendency.1 In the
short run technology and the state of indus-
trial competition are constants on the demand
side, while labor mobility among markets is
absent on the supply side. Demand and supply
conditions vary with the human capital (HC)
type as well as with labor union and licensing
practices.

In any particular labor market the wage
rate of central tendency is responsive in the
long run to changes in the type and nature of
unionism and licensing, new entrants,
changes in average product prices, and
improvements in technology of the employing
industry and firms. It is nonetheless true that
the actual wage rate facing the worker is
always the short-term wage rate, which may
or may not be near the long-term rate.

General Labor Market Conditions

As the concentrated manufacturing sector
and industrial unions are the principal forces
in the modern industrialized economy, I will
focus exclusively on what John Kenneth
Gallbraith has called the "planning system" to
illustrate wage determination in a labor
market.2

Initially assume a one-to-one corre-
cspondence between general human capital classifi-
cations (HC's) and labor market types. We can
think of the members of the labor supply of
a human capital type as being in rank order
(for example, 1, 2, . . . , y) from most to least
preferred employee characteristics, a labor
force queue at either a local or national level.
It is presumed that whatever involuntary
unemployment exists it will involve the
persons ranked lowest within the HC classifi-
cation.

In the short run the wage rate and the
employment level are decided by different
forces. Essentially, this separation of forces
stems from the static nature of production
processes combined with union regulations in
the short run. Union rules usually specify the
number of workers assigned to a machine and
floor area as well as their work speed. The
production process — otherwise designed by
technology — cannot be altered in the short
run. Let e be the labor hours required of
the ith human capital type (HC) per unit of
physical output in a selected geographical
area. As employment is a fixed proportion of
production, the quantity of labor demand is

\[ z_i = e_i q_i \]  

where \( q_i \) is the total output of product \( j \) which
is assumed to be homogenous across the
labor market.

If labor were paid its value in production,
the wage rate would be

\[ w_i = e_i q_i / \rho \]  

where \( \rho \) is the price of the product or service
produced by this labor type. (In Knightian
\( \rho \) would be the expected price.) No
union worker alone can influence this price.
Technological progress, a change in the pro-
duction process, can alter the demand for
a particular labor type directly by changing labor-quantity requirements. That is, while
capital and labor tend to be complements (fixed factor coefficients) in the short run,
they potentially are substitutes in the long
run. The magnitude of the direct effect of
technological progress upon the demand for
labor depends upon whether the new tech-
nology is labor-using.

Technological change can also exert an indirect effect. A new, more complex technol-
gy can result in a producer's shifting to labor
that embodies a much greater quantity of
human capital, a different human capital
type. These shifts are institutionalized via job
description changes (often required by union
agreements). Either direct or indirect shifts in
labor demands which emanate from technolo-
gical change can be represented as changes
in the values of the \( z_i \). The industrial union's
functional form is:

\[ z_i = \alpha_i + \beta_i w \]  

for a more general theory of how this sector is
interrelated with demand conditions and therefore
contributes to inflation, see [5, 79–103].
try in which higher wage costs can be passed through a constant or rising mark-up over variable or average costs. The likelihood of full-cost pricing increases with greater product market imperfection.

Whereas the level of employment is decided by the production technique and the level of product demand (output) in the short run, in the long run the connection between productivity and the wage rate is closer but of a different character than often described. The demand for labor is responsive to changes in average product prices and improvements in technology of the employing industry and firms. As the labor supply of a particular HC type usually requires a gestation period of several years, the long-run supply is a function of the expected wage rate ($w^*$) rather than the actual.

The motives for capital accumulation are not always clearly defined. However, even if producers do not desire growth to maintain market shares or for other reasons, a remaining salutary effect of adopting a new mode of production is the potential it gives for replacing labor. Beyond the reduction of the wage bill, replacement of workers with machines has further advantages: machines do not demand fringe benefits and are more responsive to managerial commands. Moreover, the long-term trend of wages is known to be upward, especially in the already capital-intensive industrial sector that is unionized. It is not surprising, therefore, that the price markup is used to generate investment funds for the purpose of acquiring a production process that utilizes less labor.

It is important to distinguish between the usual graph depicting a cause-effect relation between the wage rate and the quantity of labor demanded and a graph of the loci of wage rates and labor quantities. It is the latter that is represented in Figure 1, which shows the labor market for one unionized human capital type in a particular geographic area. (Linearity is assumed for simplicity.)

The growth of technology reduces the labor-output ratio, the loci of $w = e^{-j}$ and $z = e^{sf}$, where $z$ is employment and $q$ and $p$ are as given levels, trace out what appears to be a downward-sloping demand curve. As fixed production coefficients pertain at each new level of technology, the labor-output ratio equals the marginal labor-output ratio. As more capital-intensive production reduces labor per unit of output, by definition the marginal physical product of labor rises as $z$ declines. At higher levels of output, the wage-employment loci shift rightward at higher product price levels. However, just as a higher product price and wage rate do not necessarily imply a higher employment level, neither does a lower amount of output necessarily result in a lower wage rate.

The employers of industrial labor have an incentive and ability to substitute capital for labor in the long run. Thus, the $w$ vs. $z$ curve trace an "elastic" curve. At any time labor demand, however, is represented by only one point, such as $e(t_0)$, which is given by the current state of technology. The labor supply curve, being based upon wage expectations, tends to be relatively price-elastic. Although the actual and expected wage rates may be nearly equal (as illustrated), capital substitution may have advanced to the point where labor demand is $e(t_f)$ has declined to $e(t_0)$ so that only an output increase sufficient to shift the demand to $D'$ (at $e(t_0)$) would bring full employment to this labor market. At a constant or rising price markup, a wage increase (motivated by attempts to maintain or increase discretionary income) to $w(1)$ will bring along a price rise to $e(1)$. Alternatively, a price rise to $e(1)$ may result in an increase in the wage rate to $w(1)$. The direction of cause-effect depends upon timing in the bargaining process and may be unrelated to output changes (as illustrated). The wage rate at $e(0)$, the short-run wage rate, may or may not be near the long-term rate. Within such an environment it is unrealistic to presume that any particular worker has control over his or her contract wage rate.

In the long run, the manufacturer reduces his dependence on labor by adopting new capital-intensive processes purchased with the investment funds generated by the price mark-up. The long-run physical marginal product of labor is merely an artifact derived from new technologies. The actual relation between labor and capital is that decided by the new labor-capital required to match the skill requirements for operating the new machines and equipment. As the labor force does not know what these future skill requirements entail, the mismatch of human capital and machines often results in unemployment even when wage rates are rising. As labor is not paid its marginal revenue product, any welfare differences based upon the Pareto marginal conditions are spurious.

Differential Wages and Labor Mobility

The vita theory of the labor market provides an explanation for several kinds of wage differentials. If we make the usual assumption of "rationality" with respect to cognitive processes, these differentials represent an opportunity to "arbitrage," but any adjustments certainly cannot be expected to approach the efficiency of foreign exchange markets. The mobility of labor is a complex, difficult, and cumbersome process.

According to the vita theory, the individual achieves a higher wage rate via his or her labor mobility, either through time (temporal) or across space (spatial). The high-wage seeker would look to a labor market of licensed professionals with monopolistic supply control over high-priced services of inelastic demand with little prospect for capital-intensive technological advances located in traditionally high-wage geographical area. Significant upward temporal mobility requires the acquisition of a greater quantity of human capital (moving from $HC_1$ and toward $HC_2$). Whether this be a response to changing skills requirements from technological change or a result of the person's desire to increase status and income, the training and education augmentation requires substantial blocks of time and, unless the employer offers a training program, a substantial personal investment commitment.

Unfortunately, low levels of capital which inhibit upward temporal mobility also slow spatial mobility. Such transfers are related to desire, ability, and prospects for success. Although social barriers to labor migration no doubt vary with the quantity of human capital, the main economic inhibitor to successful migration is the cost of physical transport, financed from one's capital stock $(k + e)$, and the level of capital itself.

The search for higher earnings may end with still another obstacle to mobility. The individual may not receive the wage rate of the labor market and occupation of choice because of characteristics decided by his or her birth vita. Discrimination, be it racial, sexual, age, ethnic, or whatever, can preclude
a particular individual from receiving the wage rate of central tendency. We expect, therefore, to find earnings differentials are wider than wage differentials.

III. The Issue Regarding Control over Personal Incomes

In vita theory language, a general personal income function for the jth individual is

$$ y = g(h, k, \rho, w, m, \theta, M, R), \tag{3} $$

where the subscript, j, is deleted, y = before-tax personal income, h = hours worked, k = the jth individual’s human capital, e = the jth individual’s nonhuman capital endowment, \( \rho = \) the average price of the product or service produced by this individual’s labor (or expected price), m = an index of mobility, \( \theta = \) a variable that measures risk and uncertainty regarding income opportunities at alternative geographical locations, M = an index of monopolistic power that would equal zero for individuals with “ordinary” or average human and nonhuman capital endowments under free entry conditions in groups of large numbers, and R = a discrimination (racial, sexual, ethnic, and other) index that is negatively related to income for those who suffer economic effects from discrimination.

The amount of time available for work effort is limited by the biological constraint of the total number of waking hours (h). Divide the hours of “leisure time” between hours allocated to augmentation of human capital (h_k) and those devoted to “pure” leisure (h_l) and the terms h, h_k, h_l, or whatever can be defined by assumption.

In the vita theory monopolistic power (M)

$$ W(h, M, k, e, \rho, w, m, \theta, \theta, M, R). \tag{4} $$

The “wage rate” is the entire function W. Initially calendar time is undefined so as to express the model in the most general terms. The partials with respect to income are given below.

The Utility Functions

Satisfaction from one’s own income is relative, because the person’s utility from income is related to other known or “perceived” incomes in the society. Utilities are interdependent. Granted, the perception of utility from other persons’ incomes, irrespective of whose or how many, will normally be fuzzy.

With the fuzziness caveat initially hypothesized that relative income satisfaction is derived from own-income, the income of a representative person in a higher income interval that can be aspired to by the individual, and the income of a “representative” member from a lower income interval. In the theory the “representative” persons might be individuals that one personally knows but likely one has a vague image of an amorphous group with incomes above and below one’s own.

In general, then

$$ u = u(x, y^*, y^*, h), \tag{5} $$

where y* = before-tax personal income of a representative of the aspiration interval, y* = income of a representative of the interval immediately below the income of the individual whose income is y, and h = R - h - h, where h, is pure leisure.

Marginal dissimilarity from hours worked has two components: (1) loss of leisure; (2) labor effort. Traditionally the dissimilarity from work assumed is the same at all income and capital levels. However, an income unit from nonhuman capital normally can be generated with less labor effort than from human capital. Moreover, the productivity increases commonly associated with larger amounts of either human or nonhuman capital imply the productivity of the nonhuman capital is in either kind of capital. In common sense terms, time and effort used in calling a stock broker is small relative to the expected return. As Sotchvsky has suggested, “such lightening of the work burden might well turn out to be no less or even more important for people’s welfare than the reduction in working hours” [22, 16]. Further, some empirical work suggests that leisure is valued more at higher income levels. Moreover, in “desirable”

This section introduces a broader definition of the utility function that applies in the vita theory.

Empirical research finds the first-order partial derivative with respect to income positive in all income ranges. Marginal dissimilarity from hours worked is derived from loss of leisure and increased marginal labor effort. The individual’s labor supply curve would become backward-bending at \( L(h, b) = L(h, b) \). See Clark’s [11] survey of the empirical literature and his own empirical test.

An unusual research problem is the separation statistically of diminishing marginal utility of income through an increased range for leisure from disutility from other sources such as concern for others’ incomes, work effort required per income unit, failure of work to meet societal goals, and others that are discussed in this paper.

The risk of human capital losses also may have some effect on leisure. However, such risks do not appear to be correlated with the persons’ human capital levels.

Some persons may believe that risk of property loss is positively correlated with property holdings. The accumulation of tangible property, therefore, might lead to perceived leisure risks, a risk factor that would appear
occupations or professions, work may even yield positive utility, rather than disutility. Thus the disutility from hours worked is modified by some function of $K$, $x$, and $y$. Take these elements into account by writing utility from hours worked as a function of $h$: $f(k, x, y)$, where $dS/dh < 0$, $dS/dh < 0$, $dS/dh < 0$, and, more tentatively, $dS/dh > 0$.

The function $f$ qualitatively alters hours worked: the value of the function decreases with effort-reducing increments of capital, increases as income increments augment the value placed upon leisure, or, for that matter, decreases as work itself might become more valued at higher income levels.

Utility from income interdependencies depends in great part upon the individual's attitude toward the equality of the income distribution. More precisely, the existence and the sign of certain incremental utilities depends upon whether the individual is relatively egoistic, malevolent, or altruistic toward the receivers of the incomes in other intervals.

There are also explicit "goals of society" that affect individual utilities more indirectly, as ethical judgments. "Equality of opportunity to maximize personal income" is an example of such an ethic. Freedom of market entry, worker mobility and nondiscrimination are among those variables that reflect the reality of such opportunities. Although equal opportunity is widely construed as an American ethic, an identical type of analysis could hypothetically differ among others. Let $S$ be an index of proxy variables that measures the contribution toward fulfillment of the social objective. The social, economic, or political policies influencing $EN, dy/DR$ and $\theta$ are instrumental in maximizing the social goal of (for illustrative purposes) "equal opportunity." The impact of personal tastes or value judgments is in part moderated, therefore, by the broader social goal that could augment the satisfaction otherwise derived from one's own income. Let $g$ be a monotonically increasing function and write $y = g(S)$.

By substitution of the qualitative hours function and the social goal index in (3) the individual's utility function becomes

$$ u = w(y - g(S)), y', y', h - f(k, x, y) $$

where, by hypothesis, $y \cdot (du/dS) \cdot g'(S) > 0$, $du/dS \cdot g'(S) \geq 0, h - (du/dS) \cdot f'(k, x, y) < 0$.

Obviously, economists know little about which signs to select. However, from one's own income in isolation, always $du/dS > 0$. The existence and sign of the other marginal utilities will depend upon individuals' relative altruism and consequent responses. Obviously, any one or a few altruistic individuals cannot significantly alter the average income within the income interval. A measurable impact upon the national income from altruism or egalitarianism is most likely to emerge from the "mandatory" application of a collective decision.

Let us see what mathematical optimization of this formulation implies. Divide the income distribution into only two intervals, the "poor" and "nonpoor." The precise poverty threshold is not crucial. The poor ($p$) will

$$ u = w(y - g(S)), y', y', h - f(k, x, y) $$

1Such altruism may or may not include a voluntary willingness to give up part of one's own income to augment the income of another. Altruism is defined as regard for the economic well-being of others.

What is "mandatory" at one level of implementation is not necessarily mandatory at another. In a representative democracy society's members voluntarily agree to a social pact with the government which powers the delegated voluntarily so that certain policies are enforced in such a subsequently mandatory way that the numbers of "free riders" are minimized.

Again, the total differential appears below.

The income constraint, utility function, and differentials for the representative nonpoor are comparable to those of the poor except they follow (4) and (6), respectively, and in the two-interval model, $y = y' - y''$.

IV. Implications for Microtheory, Human Capital Optima, and Income Maxima

The unconstrained maxima for the poor and nonpoor respectively can be defined as

$$ \max x, \max x' $$

where the sufficient conditions require that all first-order increments be zero and all second-order increments be negative. The maximization of life-cycle utility implies that at any point in time maximum utility is a point on the optimum life-cycle utility path. Let us denote these unconstrained maxima as "ultra-maxima." Ultra-maxima are ideals achievable only in utopias. Not only are current incomes and hours worked constraints that preclude ultra-maxima but so are the other independent long-run variables—human capital, non-human capital, risk, entry conditions, and discrimination. The peaks of the utility mountains represented by (9) are inaccessible.

The conventional "optimism" with respect to hours worked occurs at a socially static time, a period in which social attitudes and public policies as well as capital levels are non-changing. Because these conditions pre

The total differential of $u$ is

$$ du = \left[ (du/dS) \cdot g(S) - h \cdot (du/dS) \cdot g'(S) \right] \cdot dy + \left[ (du/dy) \cdot dy + \left[ (du/dk) \cdot (du/dk) \cdot dk + \left[ (du/dx) \cdot (du/dk) \cdot dx + \left[ (du/dy) \cdot (du/dk) \cdot dy \right] \cdot dk \right] \right] \right] \cdot dx $$

The solution of the comparative static with the assumption of indifference is

$$ du = \left[ (du/dS) \cdot g(S) - h \cdot (du/dS) \cdot g'(S) \right] \cdot dy + \left[ (du/dy) \cdot dy + \left[ (du/dk) \cdot (du/dk) \cdot dk + \left[ (du/dx) \cdot (du/dk) \cdot dx + \left[ (du/dy) \cdot (du/dk) \cdot dy \right] \right] \right] \right] \cdot dx $$

At this point we need to be very clear on the meaning of our notation. Put a function $f = f(xy), y$ and the value of
exist, however, the optimum is at a higher or lower level of utility than it otherwise would be. The more broadly defined via “optimum” for a nonpoor person would be:

$$dy/dt = Y_{1}(k, \rho, \theta, \kappa, \nu, \kappa,y)$$

(10)

The similar “optimum” for the nonpoor interval would include a constant value for $x$. These “optima” are derived with non-changing opportunities for maximizing personal income, except for changing hours worked. Even the hours worked can only be varied within the boundary conditions decided by institutional arrangements and biological work effort limits. Moreover, the poor’s own “optima” without some substantial change in endowments leaves them still poor. The nonpoor “optimum” also is very limited because the constraints preclude any means for capturing any externalities from redistribution of income.

Utility interdependence brings into question the meaningfulness of using the standard marginal conditions for optimas. First, the variables determining the respective income constraints are independent because the capital endowment for $p$ is unrelated to the $n$ endowment, but the utilities from the two incomes are interdependent. There is no assurance that $p$‘s utility can be maximized with respect to $y$ when $p$ has no control over $n$’s income and vice versa. Positive and negative externalities are present, not rationalized by markets, not likely resolved by private transfers, and therefore preclude simultaneous true optimas. Second, (10) and its $n$-interval counterparts themselves are only obtainable with current human-non-human capital endowments, the present state of competition and market prices, that is, with no sale of or grants altering current income from all sources.

The above specification alters the traditional relation between hours worked and leisure. The wage rate is only part of the personal capital return for the nonpoor. If we include the impact upon income of non-human capital and assume that utility is constant (i.e., form indifference curves), the individual will choose more leisure time. That is, in part personal income determines the amount of leisure time rather than the one-way causality wherein the leisure-time decision determines income. With the limitation upon augmenting income by increasing the number of hours worked, how does the individual improve his economic status? The utility theory suggests that any significant improvements are derived from switching to a higher wage rate. Since such a change can only be made via temporal or spatial mobility, we must consider the human capital optimum and therefore changes that can occur (if at all) over the long run.

The earnings function is not at first “causes” in terms of birth, pre-career, and market work hours. As these are defined elsewhere and fixed, only the mature age of a person is represented as

$$k = F(G, h, s, t, x, \kappa, e, r),$$

(11)

and

$$x = H[L_{0}, s, G(h, s, t, x), e, r, k],$$

(12)

where $L_{0}$ is the initial nonhuman capital stock, $G$ represents the genetic code, $E$ represents family environment conducive to earnings potential, $x$ is the hours of education within the sole control of the individual, $s_{t}$ is the number of hours of State-required formal schooling, $t$ is the hours of initial-on-the-job training within sole control of private industry, and $e$ is years of experience. Net additions to total capital can be derived from increases in the hours devoted to human capital accumulation. Assume that $G$ and $E$ are indices that take on larger values when they are favorable for augmenting human capital (earnings capability) at birth. Assume now that the poor have some positive value of non-human capital so that the forms of the $p$ and $n$ optimas are identical. Also assume that $d_{1}/dh_{1} = 0$ and therefore $d_{1}/dh_{1} = -1$. Subtract the capital functions of (11) and (12) into the earnings equation (8). At any time the individual is optimizing w.r.t. the rate of voluntary education training if

$$dy/dh = Y_{2}(p, \theta, \kappa, \nu, \kappa,y)$$

(13)

Voluntary education and training over the life plan is optimized by a life-cycle of optima that begin with the pre-career note. Note also that, by the assumption that hours allocated to human capital production detract from work effort, if the work hours $d_{1}/dh_{1} = -1$, the income derived from work effort is reduced by the value of $W$.

If $W = 0$, or the individual is at the institutional or biological working-hour limits, one cannot seek a higher income. On the other hand, the case where $I_{0}$ is significantly large that reduced work effort is not a constraint on human capital development is approximated by assuming $d_{1}/dh_{1} = 0$. Then,

$$3After substitution of equations (11) and (12) into (4) as the test, take their differentials. Subtract the differentials of the earnings function $dy/dt$ into the differential of the utility function. Then set the differentials of the utility function equal to zero and solve for $d_{1}/dh_{1}$; to $d_{1}/dh_{1}$ is now a non-linear mathematical constraint. Use our abbreviated notation (see footnote 11) and we have the simplified “optimum” w.r.t. hours worked for the poor, equation (11). The more complex form of the derivative can be set down by inspection of their components to the differential equations of the text. For example, $U(p, t, \kappa, k, \nu, \kappa, y) = 0$, where $t$ = $t(\kappa, n, \kappa, r, \nu, \kappa, y)$. Also, show that $d_{1}/dh_{1} = Y_{1}(k, \nu, \kappa, \theta, \rho, \kappa, y)$, which is the basis for the optimality conditions. To $d_{1}/dh_{1} = 0$ by assumption, $d_{1}/dh_{1} = 0$, and $\kappa$, is no longer a mathematical constraint. Use our abbreviated notation (see footnote 11) and we have the “optimum” w.r.t. hours devoted to human capital development.

The higher-order optimality conditions are met by assumption.
\[
dy/dt = -Y_t(x, b, dy/dt) + K_t(G_t, s_t, z_t, E, r) + Y_t(u, b, EN, dy/dt) + K_t(A_t, G_t, s_t, z_t, E, r) - U_t(y) - U_t(y).
\]

Large initial endowments free the individual to increase the hours devoted to human capital without having to be concerned about the reduction in current income via reduced work effort. Therefore, material inheritance can be important in defining the initial conditions which affect the lifetime income path.\(^{22}\)

**Costs of Increasing Human Capital**

In human capital theory the person invests in an educational or training program that has a positive net present capital value.\(^{23}\) However, in reality the optimum human capital level depends upon the same constraints as those that determine current incomes. In short, if one could ignore costs and claim a favorable genetic code and family background (G and E), the "rational" individual would decide to become Human Capital Type 1.

However, expected costs cannot be ignored. Assume that parents and, subsequently, individual rank costs in the same order as the general human capital quantity requirements (HC’s), then \(C_1 > C_2 > C_3 > \ldots > C_n\). The accessibility to a human capital type that yields a higher return applies depends strongly upon initial capital endowments and the current income that such endowments yield.\(^{24}\) The observed inability of individuals to acquire any HC type they desire cannot be attributed to "imperfect capital markets"; this failure often can be traced back to the birth Vita.

The individual’s investment potential may be restricted to a Human Capital Type and hence a labor market that will yield a small stream of lifetime income. We are merely suggesting that capital tends to beget human capital tends to beget income tends to beget capital, and so on. One moves to a higher income interval by altering one’s setup and then shifting from one labor market to another. Any movement toward social optimization (either in comparative statics or in life-cycle terms) requires some sequential ordering of optima (in a climb up the poor and nonpoor utility mountains) as a part of the socio-political process. Mathematically, this process is replicated by a chain of differentials that implies diminishing individual control over the independent variables with each additional differential "link" that "lengthens" the chain. But this only holds in a linear approximation because the movement of a person from one labor market to another involves discrete (and perhaps large and lump sum) changes in capital.\(^{25}\)

**V. Collective Choice, Ethics and the Income Distribution**

Just as we cannot deny the roles of human and non-human capital in determining income distribution, we cannot ignore the role of collective decision-making.

Any income distribution beyond that which is determined by private institutions requires a deliberate economic policy presumably motivated by societal concerns and unquilted externalities. Although society can be viewed as a cooperative venture for mutual advantage, it is ordinarily marked by conflict as well as by identity of interests. Because of conflict, further redistribution will be decided by the balance of power among groups in the political system, an arrangement greatly controlled by ideological and ethical considerations so that only an approximation of a global maximum is possible.

This reality can be illustrated with a human capital variable. Assume that \(\delta \times \delta^2 = \delta^2 \times \delta = 0\). Then, the individual’s utility can be maximized with respect to any one of the variables amenable to policy influence — \(I, EN, G, s_t, z_t + dy/dt\). Consider State-supported schooling (s_t). Because the hours devoted to schooling are mandatory, assume that such hours are taken away from work effort hours, and the “optimum” for someone in the poor interval is \(dy/di = dy/dk = dy/dh = -U_t(s, y, y') - U_t(s, y, y')\).

The same process w.r.t. s_t applies to the nonpoor except that the level of \(f_t\) and e are non-zero and

\[
\text{dy/ds_t} = dy/dk = dy/dh = dy/dh
\]

where \(dy/dh\) may not be a constraint.

The more complex solution for the nonpoor illustrates the tension nature of such “optimums.” If in fact schooling does not detract from hours worked, the optimum must be defined in social terms; otherwise, no constraint exists. Let \(T\) be tax revenue for public schooling and we know that if \(dy/di = dy/ds_t = dy/dk = dy/dh\), then the marginal benefits are not equal for every interval in the personal income distribution. Therefore, any “optima” have to be defined in social terms because marginal tax rates are constraints on public funding. A similar problem attaches to the inheritance tax as a policy variable: From the view of the nonpoor there is no constraint regarding their increase in income from an inheritance tax reduction — unless the nonpoor are concerned about their relative income increases compared with a static income level of the poor. However, such a concern is collectively expressed in the social goal index \(S\) and probably requires the presence of, at a minimum, biased altruism (see Section III). Moreover, as society changes the mere ordering of policies, the nature of the next “optima” is altered. That is, the various “optima” are not in fact independent and thus the overall social configuration is crucial.

In the history of economics in the English-speaking world the dominant ethic used to judge the worth of economic arrangements has been utilitarianism in one form or another. The assignment of utility to each individual mirrors utilitarianism. With sustained economic growth in a society, the belief that everyone can become equally better off is a convenient ethic to counter those who would suggest any willful redistribution of income. Nonetheless, the transformation of utilitarianism into Pareto optimality has taken from economists the capability to judge the personal income distribution on utilitarian grounds. Although it is argued that only the individual can judge his or her own satisfactions, the “given” nature of preferences precludes any evaluation of the meaning of optimality welfare criteria. This analytical
The Pareto dilemma has led many economists to the principles of justice of Harvard philosopher John Rawls [19]. The vita theory also points to the issues raised by Rawls regarding the random and thus "arbitrary" nature of initial endowments in determining the income and wealth distributions. As we shall see, to raise and clarify the issues—though helpful—does not resolve all the analytical difficulties.

The Rawlsian Principles of Justice

In Rawls's "original position" the principles of justice are chosen behind "a veil of ignorance" so that no one is advantaged or disadvantaged in the choice of principles by the outcome of natural choice or the contingency of social circumstances. The "veil of ignorance" is such that persons do not know particulars concerning their own capacities, personal likes or aversions (such as risk aversion), or the positions they would occupy in an ongoing society. The persons in the original position are "rational" having a coherent set of preferences among options, the individual ranks the options so as to advance his own interests. Rawls makes the special assumption that individuals do not suffer envy because envy tends to worsen everyone's lot. With no other side conditions, the prototypical person of the original position would be indistinguishable from the prototype of the Pareto economic man.

The Pareto economic man, however, is completely autonomous—to the point of not even considering himself to be a member of society. Although the rationality in Rawls is one of mutual disinterest, the parties are nonetheless capable of a sense of justice because of their knowledge about the general facts of society [19, 142-145]. This preference for social intercourse diverges from the autonomous economic man prototype.

In the original position persons prefer more to fewer primary goods because the individual perceives his or her own ends (which are not known in particular) if he or she possesses more such goods. In the vita theory context the increased quantity and quality of human and nonhuman capital would best advance one's own ends.

Among the primary goods are opportunities and powers, and income and wealth. Rawls couples powers and wealth: "greater powers and wealth tending to go together..." [19, 94]. By "powers" Rawls apparently means the ability to achieve one's ends. However, it is difficult to separate these abilities from the exercise of power (over others) in a general, political sense.

The assumed "finality" of the social contract leads to a unanimous decision from the "original position" in which the "worst off" representative person will be in the best circumstances possible. This "maximin" solution yields two principles, the second of which concerns us most directly. The difference principle holds that social and economic inequalities are to be arranged so that they are (a) to the greatest expected benefit of the "worst off" members of society (the maximin equity criterion) and (b) attached to offices and positions open to all under conditions of equality of opportunity [19, 12]. The difference principle is applied by open competition for offices and positions, and then subject to this constraint, by the arrangement of social and economic inequalities so that everyone benefits [19, 61].

By assuming that powers and wealth go together, Rawls narrows the residual social and economic inequalities to those of wealth and income. Such inequalities are permitted only when they can be shown to be to the advantage of the economically "worst-off" societal group. Then, because everyone benefits from economic and social equalities, "there is an identity of interests since social cooperation makes possible a better life for all" [19, 126].

Rational Individualism and Social Cooperation

An ostensible paradox derives from what appears to be an unduly individualistic concept of rational persons in the abstract original position, in contrast to Rawls's early call for "social cooperation" [19, 4]. At first glance, Rawls too appears to be caught in the old dilemma. This seeming paradox can be resolved in two ways.

First, embedded in the original position is the notion of a "well-ordered society," a society in which persons share the same views about justice derived from their general knowledge about human society. The conception of justice is not egalitic (as, e.g., Pareto optimality is), but is based upon individuals understanding that social cooperation makes possible a better life for all than any would experience, each for himself alone. Furthermore, one's ends require the cooperation of other members of society. As Rawls sees, mutual disinterest (as to particulars appended to others) and the veil of ignorance "forces each person in the original position to take the good of others into account" [19, 148].

Second, the value of community is established by Rawls in (Part II), using the idea of "reflective equilibrium." The members of society reexamine the principles of justice (especially in comparison with what Rawls too considers the main competing principle of utilitarianism and its individualism) and find, upon reflection, that the correct principles have been chosen. As Rawls states, "not until later is justice seen as part of our good and connected with our natural sociblity" [19, 584].

Rawlson Utility Functions

We now come to a second apparent paradox. The interdependent utilities outcome in the original position is analogous to that for pure altruism. The conditions assumed achieve the same purpose as interdependent utility functions such as those formulated in this article. When one makes a decision in the original position, the choice is made simultaneously for oneself and for everyone else, because any individual has an equal expected probability of ending up in the same socioeconomic condition as any one of all others. The assumption forces one's own utility to be determined as if it were everyone's utility, making the inclusion of other persons' income in one's own utility function redundant. In the ongoing society the "as if" outcome is no longer sufficient, however, and interdependent utility functions are required. Only in social union can each person participate in the sum of the realized natural assets of others.

The Problem of Social Conflict

Although society is a cooperative venture for mutual advantage, Rawls admits that on a micro level "it is typically marked by conflict as well as by an identity of interests" [19, 14]. It is on the subject of conflict that..."
There are at least two types of public policies that can alter the level of welfare, which I will call: (a) Democratic and (b) Interest driven public policies. 1) The Democratic Policies: Policies that influence geographic-occupational mobility and the income effect of discrimination (through $h$, $\beta$, $\kappa$, $\eta$, $\phi$, $\beta_0$) also indirectly alter the income distribution. The individual expects indirect control over income (including own-income) through society's institutions. These parameters give us the income in equation (4). Although these policies may lack the expected impact, may be incorrectly perceived, may not be pursued vigorously, society moves to a second classification of policies. 2) The Public Interest Policies: Society may choose to alter the distributional preferences (see Friedman's and Tobin's negative income tax proposals as well as Bouvling's Grant Economics). Although the maximization problem is attacked more directly through pure collective choice, decisions on relative incomes nonetheless are delegated to the government fiscal institution as one part of a social contract.

The individual yields some personal sovereignty. Taxation always involves a mandatory rule for collection which normally precludes an optimum tax rate from the view of every person taxed. Some sort of sovereignty; however, is pre-existing in the State at the inception of a social contract. Long ago Buchanan charac-
terized political voting as "an alternative power structure which may be deemed preferable to that of the market" [2, 341].

3Although all these policies change the income distribution, they may not have been motivated entirely by such a goal. For example, mandatory education may be urged by those who see minimum education for the population as necessary for the effective functioning of a democracy. Indeed, the lack of specific redistribution intent may be a force leading to the Public Interest State policies. For example, empirical studies show that incentives in education can contribute to economic growth without significantly changing the distribution of income.

For an excellent discussion of "social control" in the voting process, see Buchanan [2, 336].

Democratric policies would work on the constraints related to a, b, and c, attempting to provide equality of opportunity and to keep offices and positions open to all. These policies would have Rawlsian priority over public interest policies, and might include free public education, a public library system, judicial actions against discrimination, free medical services to those born frail, anti-trust policies, and so forth. However, if democratric policies fail or are otherwise inadequate in meeting Rawls' difference principle, public interest policies would emerge to directly redistribute income through taxes and grants. A socially optimum condition depends upon the nature of the utility function of each interval. Let $p$ and $n$ denote the most representative members from each social group. At a fixed level of national income simultaneous optimum for each representative requires

$$dy^y/dp = -(U^y_p / U^y_p) - (U^y_p / U^y_n)$$

which states that the ratios of the marginal utilities from nonpoor and poor incomes are equal for the representatives from either income interval Recall, however, that social values and goals may be such that the nonpoor individual might receive smaller increments of satisfaction from the same unit of own-income than he or she otherwise would. If the utility ratios are equal government can select the $y$s in such a way that the maximum implied by (17) is realized.

Suppose, however, that $U^y_p / U^y_p = U^y_n / U^y_n$ so that what is optimal for each separately is not optimal for the society. A global maximum would require the aforementioned homogenizing agents, say $p^y$ and $p^y$, so that

$$dy^y/dp = - p^y / U^y_p$$

$$- p^y / U^y_n$$

The homogenizing agents may come from
increased information flow, a change in the g function, or altered personal value judgments. The difference principle itself may ultimately provide the homogenizing ethic.

Any movement toward the difference principle optimum is contingent upon both groups benefiting (in some sense) from a transfer of income from the nonpoor to the poor. In economic terms the necessary conditions for such a move depend upon a diminishing marginal utility of income and the actual interdependence of utilities. The sufficiency conditions require that the nonpoor have reason to transfer diminishingly satisfying but nonetheless positive increments of expected income utility to the poor. Needing the representative poor nonpoor have "fairness" as an impartial observer of their utilities. They are their own utility beholders. And, as Measgrave contends, a social optimum requires "the mandatory application of the voting decision . . . to secure revelation of preferences" [16, 992].

Unless ideology dissuades them, the poor view existing income inequalities as undesirable, if not unjust. If the nonpoor resort to the rationality of Pareitian opbellity and the self-interest assumed in Rawls' original position, they will not respond by making income transfers. However, if human nature is as Rawls describes it in reflective equilibrium, and the nonpoor perceive the advantages of social cooperation (perceivable even in the original position), the nonpoor will realize that natural endowments are common assets and that the society will lose its stability if the poor are not compensated in a way that retains their cooperation. The poor presumably know, however, that they cannot push the nonpoor too far in redistributive efforts, because then everyone would lose income. That is, the poor desire to live in a well-ordered, stable society as well.20

20Following Rawls, we abstract from any influence that ideology might impose on the poor's degree of acceptance of their socioeconomic rank.

Ironically, Rawls' assumptions about human behavior, in the absence of commitment to principles agreed to in the original position, lead to a utilitarian outcome. That is, an income redistribution from the nonpoor to the poor raises the sum of utilities and therefore societal utility (in a utilitarian sense).21 However, the wealth-power duality in Rawls prevents his system from resolving social conflict in a society pervaded by substantial inequalities. In such a society, a very wealthy group, would, under Rawls' assumption, also be very powerful in achieving the ends of its representative member. Suppose this well-financed group retained the rational self-interest assumed in Rawls' original position and therefore used its power to maintain (at least) the status quo. Suppose such a group can effectively influence policymakers by campaign financing and lobbying as described by Okun [18, 22-31]. Dollar vote outcomes in an income distribution determined at the margin by the government would leave the distribution with income differentials that closely approximate those of a market economy. Obviously, there is no distribution that would give a simultaneous optimum in terms of the poor and the newly-assumed wealthy group.

VI. Concluding Statements

Pareitian opbellity optimas, at their best, require that factors of production be paid their marginal products. The vita theory raises serious doubt about the processes of production, due, in part, to the productivity of all factors concurrently. Then, the level of employment in any particular labor market is decided apart from the wage rule, an outcome that precludes matching wage payments with labor's marginal product. The Pareitian optimas are not even "second best" under these conditions and welfare optimas based upon efficiency conditions become more remote from reality.

Unconstrained maxima are achievable only in a utopia which is literally, "no-where." Interdependent utilities and the weakness of individual control over crucial variables lead to social policies. The definition of a social optimum can be altered as a society devises more and more policies that reduce existing constraints that limit optimas.22 While the traditional Pareitian criteria on Samuelson's Utility Possibility Curve give infinite efficiency optimas at one given income distribution, my model provides the basis for a large but finite number of social welfare optimas out of nearly infinite income distributions. Whereas the expansion of the core to include collective choice facilitates the definition of a maximum feasible social welfare optimum that does not rely upon the Pareto optimality conditions, a renewal of welfare economics would require the use of an ethic regarding the social desirability of an income distribution selected from all possible distributions. When economists are pressed to select an ethic, they historically have retreated into utilitarianism. John Rawls claims to offer a competing set of principles.

However, there is a curious puzzle in Rawls. He says that "the motivation of the person in the original position must not be confused with the motivation of persons in everyday life who accept the principles that would be chosen and who have the corresponding sense of justice" [19, 148]. Given our knowledge about human nature, in the original position persons are not trusted to be fair to anyone but themselves. Why should we suppose that persons in the ongoing society without the benefit of the original social contract suddenly would behave in a benevolent way, especially since the same knowledge of human behavior persists? Why is Rawls not willing to advance the two competing systems (Rawls' principles and utilitarianism) on their own merits?

The answer appears to be roughly as follows. Rawls wants to justify his principles in the accepted "scientific" sense (i.e., using rational choice and social contract theory), with no direct appeal to moral values as such. However, he is in danger of being in the same dilemma as is the Pareitian welfare economist. If the economist equates the self-interest of the original position to egotism in society and ignores persons' "natural sociability," optimas still are of the Pareitian opbellity variety. As a result, the Rawlsian assumptions about behavior in a cooperative society provide an incomplete model of income redistribution. The optimal income distribution depends upon the interdependent utility functions from the view of persons in the ongoing society.

The realization of a social minimum awaits the perceived identity of interest with the poor of the nonpoor, or else their altruism. This does not mean that Rawls' difference principle should be ignored. With a fate formerly reserved for John Stuart Mill, Rawls has presented a vision—not a program—which inspires thoughtful considerations of existing social arrangements. Most importantly—at least from the view of an ethic acceptable to economists—Rawls' system of justice approaches utilitarianism (with constraints) when we apply his principles to the income distribution of the ongoing society.

References


21As with most expressions of utilitarianism, Rawls' is utilitarianism "with constraints," see [1].

The Macroeconomic Effects of a Payroll Tax Rollback

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In late 1977 the U.S. Congress passed social security legislation that included a series of increases in the payroll tax. These increases, which began in 1979 and carry on into the 1980's, substantially raise the projected levels of the social security trust funds. Since the amendments were passed, there has been some discussion and several proposals to roll back part of the tax. It is highly likely that additional rollback proposals will be made in the near future. The purpose of this paper is to shed some light on some of the macroeconomic effects of a payroll tax rollback.

A major rationale underlying rollback proposals is the acceptance of the notion that payroll tax increases are inflationary. If true, it follows that a rollback would tend to at least partially relieve some of the current inflationary-pressure in the economy. Presumably, the price reducing effect of a rollback is implied by a model in which prices are determined by costs of production. A cut in the employer portion of the payroll tax, a component of production costs, ceteris paribus, leads to a drop in prices. But the ceteris paribus condition is violated if other cost components are affected by the tax rollback. These other effects depend on the method used to finance the rollback and the shifting pattern of taxes. A payroll tax cut can be financed by increased debt issue (which may or may not be monetized), by increases in other taxes, or by a decrease in government spending. Attention should be focused on the payroll tax cut-financing device package. With some financing devices, such as the value-added tax, other components of production costs are directly increased, offsetting the cost-reducing effect of the payroll tax cut. Since production costs and thus prices are likely to be sensitive to changes in aggregate demand, the demand effects of the package must also be considered.

The shifting patterns of taxes is also relevant in an analysis of the effect of a payroll tax rollback on costs and prices. If the rollback is shifted back to employees in the form of higher nominal earnings or fringe benefits, then the cost reducing effect is offset. The shifting pattern of the financing instrument may also lead to these indirect cost changes.

Our paper has three parts. First, we utilize an aggregate demand-aggregate supply model to more carefully delineate the channels that the payroll tax rollback package can take to affect the major macroeconomic variables: the price level and real output. Next, to quantify these effects we discuss simulation results obtained from two large-scale econometric models. These simulations are condi...