

# The Production of People by Means of People<sup>1</sup>

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In 1960, Piero Sraffa developed a mathematical model that belatedly crowned the achievements of classical political economy. Presented in an essay entitled *The Production of Commodities by Means of Commodities*, it showed how the output of the economy as a whole could be measured in terms of its physical inputs, rather than simply in dollar terms. Like David Ricardo, the early nineteenth century economist who inspired his approach, Sraffa assumed that labor was a unique input because it was not “produced” by labor, but only by the consumption of a wage bundle. His model made it possible to describe a production process in which commodities, including labor sold for a wage, produced other commodities--hence the title of his essay.

Modern economics has, for the most part, moved beyond this Ricardian logic. But it is still largely shaped by a focus on the production of commodities rather than people. We measure the success of economic systems by the value of their marketed output relative to their population, or Gross Domestic Product per capita. We assign no pecuniary value to the production of human beings or their capabilities. We define what we call “human capital” very narrowly and devote little attention to its development outside of schools and workplaces. We ignore differences in bargaining power between men and women, parents and children, and other family members that affect the distribution of the cost of caring for dependents. In short, we have little to say about the production of people by means of people.

This essay outlines an alternative approach that disaggregates flows of money and time devoted to the care of children, other dependents, the maintenance of adult capabilities, the development of adult capabilities, and luxury consumption. This disaggregation is primarily directed at the family/community and government sectors of a domestic economy, setting aside, for the time being, disaggregation of the market sector and any consideration of foreign trade.

It treats both money and time devoted to the care of children and the development of adult capabilities as investments in human capital, and resources devoted to the maintenance of dependents and of adult capabilities as necessary consumption (these could, alternatively, be construed as expenditures representing “maintenance and partial compensation for depreciation,” or another category of investment).

This framework takes the concept of “human capital” seriously, treating it as an asset that is co-produced by families and government, rather than merely a product of the education sub-sector. It divides family and government expenditures into both consumption and investment, rather than treating them both primarily as consumption. The framework also goes beyond a concept of human capital as “value added” to some exogenously given biological substrate to consider spending on basic necessities and health as maintenance costs rather than discretionary (here termed “luxury”) spending.

It has important implications for three important areas of economic inquiry suggesting that 1) the measurement of living standards should be expanded to include consideration of both the costs and benefits of unpaid work, 2) macroeconomic theory should acknowledge and measure the value of unpaid work as a dimension of output and expand its definitions of investment and consumption and 3) public finance should focus more explicitly on both private and public intergenerational transfers.

The presentation begins with a brief critique of conventional approaches to these issues, then outlines the expanded accounting framework in its simplest form. Next, it summarizes the broad implications for definition of living standards, macroeconomic theory, and public finance, including a review of the recent theoretical and empirical literature. Finally, it focuses on the issue that intersects much of the recent feminist literature on macroeconomic and development policy, how best to define the “costs of social reproduction,” and offers estimates of the value of time and other resources devoted to children in the U.S.

### **The Limitations of Conventional Economic Theory**

In recent years neoclassical economists have begun to devote more attention to what goes on inside families, to highlight the importance of investment in human capital, and to explore the quantitative dimensions of unpaid work. Yet their efforts have fallen far short of a comprehensive or convincing treatment.

#### **Defining and Valuing Non-Market Work**

The neoclassical theory of individual time allocation takes tastes or preferences as a given and presumes that individuals maximize their utility subject to a budget constraint. Work is defined as an activity that individuals engage in only in order to gain income or goods and services that yield utility. That is, work is, by definition, not a source of utility in and of itself. Individuals allocate their time between three activities (market work, non-market work, and leisure) on the basis of the marginal utility they gain from these. From this perspective, “full income” is the sum of the utility gained from all three activities, and leisure contributes to full income.

Further, the spillover effects of individual time allocation—the effects on others—are relevant only insofar as individuals have altruistic preferences. That is, I don’t derive any utility from actions that make you better off unless I care about you. So-called “externalities” are irrelevant (Folbre 2004). Since underlying preferences are unobservable, it is difficult to derive any predictions from this model other than those related to the effects of exogenously given changes in income or prices.

Models based on individual utility maximization are largely irrelevant to national income accounts. The price that an individual pays for a market-produced good or service is determined, in theory, by the market. An individual may enjoy a “consumer’s surplus” (that is, they may have been willing to pay a much higher price for a good than they actually paid). As a result, the sum of market prices in an economy does not provide a measure of the total utility enjoyed by consumers. National income accounts are not a measure of social welfare.

If one believes that, nonetheless, national income accounts provide a useful way of tracking the stocks and flows of resources in an economy over time, one should try to arrive at measures that can accommodate all the relevant stocks and flows. The problem, of course, is to find a common denominator as a measure of value (a problem that has preoccupied some economists since Ricardo). Imputed market prices, based on a simple counterfactual (what would it cost to purchase goods or services of comparable value) represent the simplest choice, though for reasons I will later elaborate, they are not ideal.

Looking at individual (and family) income in terms of material flows of time and money could be considered a “classical” rather than a “neoclassical” approach, consistent with a kind of input-output or social accounting matrix methodology. The accounting framework above is designed to facilitate comparisons of the value of non-market work and intra-family transfers with market income and government transfers and also to compare the net income and consumption of different family members.

### **Intra-Family Transfers and Spending on Dependents**

In general, both traditional neoclassical theory and its macroeconomic offspring focus on the intentional decisions of economic actors in the market economy. As a result, both family transactions—and many aspects of the public sector that essentially support family activities—are obscured from view.

While the focus of economic theory is gradually widening, it remains relatively constricted, with three important consequences.

First, decision-making within the family itself gets little attention. The mainstream neoclassical theory of the household, best represented by Gary Becker (1991), treats the family as though it were an individual, maximizing a joint utility function. From this perspective, it doesn’t make much sense to explore intra-family transfers. However, an emerging genre of bargaining models unpacks family decision making, calling attention to the impact of differences in fall-back positions that generate a range of unequal outcomes (McElroy 1990). So-called “collective” models based on the assumption that households are efficient predict unequal distribution in the household if fall-back positions are unequal (Bourguignon et al. 2009).

Similarly, most neoclassical models of intergenerational transfers assume that families maximize a dynastic utility function that takes the utility of future generations into account, (an assumption that leads to the conclusion that government transfers completely crowd out intra-family transfers) (Barro 1974). Here too, new approaches are emerging, exploring the impact of “exchange” motives that reflect bargaining power: that is, adult children may transfer more resources to aging parents who exercise some leverage through ownership of household assets (Cox 1987).

Second, the determinants of family decisions receive far more attention than the *consequences*, perhaps because the utility maximization framework assumes that family members are rational actors who have all the information they need in order to make utility maximizing decisions.

As a result, *intentions* displace *outcomes* in the definition of categories such as consumption and investment. For instance, individual decisions to spend money on children or on aging parents are treated as similar to decisions to spend money on a sports car or a golden retriever, yielding a flow of utility or psychic income.

Taken to an extreme, this perspective suggests that family income should not be adjusted for family size using a per capita measure or any other equivalence scale (Ferreira et al. 1998). A woman choosing to raise a child on her own has simply made a consumption decision, which doesn't reduce her disposable income. Presumably the utility she gets from the child compensates her fully for the expense—else she would not have chosen to incur that expense. The same may be said of an adult choosing to provide daily assistance to a failing elderly parent.

As Henry Simons put it in his classic treatise of public finance, “it would be hard to maintain that the raising of children is not a form of consumption on the part of parents, whether one believes in the subsidizing of such consumption or not.” (1938:40). William Vickrey rebutted this view, invoking both social welfare (“the community has a greater interest in the welfare of children than the welfare of pets” and the rights of children, who, he argued, should be viewed as “citizens in their own right” (1947:292). In a sense Vickrey is arguing that whatever parents' intentions are—and these are almost certainly related to a desire to obtain personal satisfaction from parenthood—the consequences are quite different than those of other consumption decisions.

Yet this point has hardly influenced macroeconomic theory. An important genre of macroeconomic theory based on an “overlapping generation” model first outlined by Paul Samuelson in 1958 calls attention to relations between working age adults and retirees, but ignores children, treating them as “part of their parents' consumption” (Samuelson 1958). Like most macroeconomic models, these take the rate of population growth as exogenously given.

The term “labor supply” is interpreted as factors that influence an adult's decision to engage in paid employment, ignoring the process by which workers are actually created, produced, and made available to paid employment—because parent's intentions to raise children are not entirely driven by prices and incomes.

The phrase “parental investment in children” is now widely deployed by economists, sociologists, and demographers alike to describe time devoted to children, but largely confined to efforts that might increase or enhance their productive capabilities, such as “reading aloud.” But because parents don't conceive and rear children in order for them to become future workers and taxpayers, most of their efforts are taken for granted.

This emphasis on motives rather than outcomes helps explain reluctance to examine, value or carefully measure the depreciation of unpriced natural assets such as forests, fish or stable ecological systems. These forms of “natural capital” were not intentionally created with a view to capturing a future rate of return. Nonetheless, if sustainably managed, they obviously provide future returns (Nordhaus and Kokkelenberg, 1999).

A third, related consequence of the focus on individual motivation is that unexpected outcomes tend to be ignored. In the stylized world of perfectly competitive markets with perfect information, decision-makers know what to expect. In the real world, however, coordination problems often come into play. Strategic uncertainty means that anticipated payoffs differ from real payoffs. For instance, a parent raising a child has little way of knowing what future wages for that child will be, in part because this outcome is affected by the simultaneous decisions of many other parents to raise or not raise children.

Classical economists, including Thomas Robert Malthus, interpreted the world in these terms. Malthus famously predicted that provision of poor relief would cause men and women to marry at an earlier age, have more children, and lower future wages. Many other examples of unanticipated consequences come to mind: rapid population growth can be a catalyst for technological change; sex-selective abortion or infanticide can alter the sex ratio of an entire population, rapid fertility decline can impose significant strains and stresses on public pension systems, etc.

Social institutions, including property rights and cultural norms, often emerge partly as a response to coordination problems that cannot be solved by decentralized individual decisions. In general, economists have not devoted sufficient attention to the institutional context in which individual decisions are embedded.

### **A Summary of Limitations**

Conventional economic approaches to unpaid work and intra-family transfers are not necessarily incorrect. They are, however incomplete. They ignore the contributions that these factors make to material living standards. They ignore the role that non-market “output” has on economic growth, and rely on definitions of consumption and investment that ignore the importance of developing and maintaining human capabilities. Finally, they overlook some of the most important causes and consequences of demographic change—unanticipated “externalities” that are more strongly influenced by social institutions than by individual decisions.

Here are some illustrative examples, which set the stage for a more detailed consideration later:

*Living standards.* Both unpaid work and intra-family transfers have important implications for material living standards. Compare, for instance, two families, both consisting of two adults and two children, with exactly the same market income of \$50,000 per year. We typically treat these two families as having equivalent living standards (setting aside details such as possible differences in geography, health, taxes, and transfers). Yet a family in which one earner brings home \$50,000 and the other adult works forty hours a week or more providing unpaid domestic services and childcare clearly has a higher living standard than one in which two adult earners bring home \$25,000 each and must purchase child care and other services in order to maintain their employment.

*Macroeconomic theory.* Because unpaid work and intrafamily transfers affect material living standards, they represent part of economic output. One common illustration of the consequences of ignoring them emphasizes the effect of increased female labor force participation on economic

growth. In general, women's increased employment biases estimates of economic growth upward, because the wages they earn are counted as part of GDP but the reduction in the amount of time they devote to unpaid work is not counted. Another important illustration concerns the impact of unemployment, which may or may not be partially compensated by increases in the amount of time devoted to non-market work.

*Public finance.* Public transfers to retirees from the working age population represent at least partial payback for the taxes the working age population paid that were devoted to education of the younger generation. The terms of this intergenerational transfer affect the net cost of children to parents and also the long run sustainability of public transfers. As fertility declines and the average age of the population increases, the burden on the younger generation is likely to increase. Yet conventional accounting measures provide no clear measure of lifetime taxes and transfers, making it difficult to assess concerns about intergenerational justice (Folbre and Wolf 2013).

### **Accounting for Unpaid Work and Intra-Family Transfers**

A general accounting framework can help clarify the conceptual issues at stake. At this stage, the framework offered here is entirely unconstrained by the rather obvious measurement problems that arise. However, it does provide some insights into possible empirical exercises which could include disaggregation of family and government spending on children, individuals who are sick, disabled, or frail elderly, and working age adults, and spending that represents creation of new human capital capacity compared to that devoted to maintenance and depreciation. It offers a set of criteria for categorizing these expenditures as investment, necessary consumption, and discretionary (or luxury) consumption.

As a result, it could help trace the interaction between family spending and government spending (as when government provision of education or health reduces family spending on education and health) and on intergenerational transfers of both money and time that take place both within families and through the state.

The accounting framework is also designed to conceptualize the distribution of the costs of caring for children, other dependents, and other adults by gender, and by age group. It links to models of intergender inequality of particular concern to feminist scholars and to intergenerational income flows that have typically played a more important role in the demographic than in the macroeconomic literature.

A brief narrative discussion of each equation in the accounting framework draws on the broader literature, providing motivation for the accounting exercise and pointing to relevant subtopics that may be developed further at a later date.

Note that the use of "families" rather than "households" is intentional here; flows of time and money that take place within families are not limited to those between household members, and not all household members pool income. Further, the link between the family and the community is often flexible—individuals who are not related by law or kinship—including friends, neighbors, and volunteers often share resources with one another. Hence the term "family" is

construed loosely here to include the “community” as well (it does not include formal transfers made through the state).

In this version, only one time period is assumed. Later versions may incorporate a more lifecycle-oriented overlapping generations approach. Some aspects of this framework—for instance, flows of money—can be incorporated into a social accounting matrix. However, the framework is designed to highlight the currently largely unmeasured amounts of unpaid labor that are provided by families and communities, which are partly (though not completely) fungible with paid labor and money purchases. Investments are defined as expenditures that increase future productive capabilities, including all spending on children. Necessary expenditures are defined as those that contribute to the maintenance of or slow the depreciation of productive capabilities. Other expenditures are categorized as discretionary.

The processes of production encompassed here (the production of people as well as commodities) are almost certainly non-linear, involving economies of scope and scale. They also yield club goods and public goods, often non-excludable and non-rival in consumption. All these factors complicate any effort to model the interactions involved.

The framework starts with individuals, but is not based on any assumptions regarding individual optimization.

### **A Definition of Individual Income**

Each individual  $i$  has total time  $T_i$  equal to the sum of four components:

Let  $T_i$  = individual time

$M_i$  = hours of time devoted to market work

$H_i$  = hours of time devoted to non-market work

$S_i$  = hours of time devoted to sleep and other physically necessary activities

$L_i$  = hours of leisure

$$1) T_i = M_i + H_i + S_i + L_i$$

Each individual has total income  $Y_i$  equal to some function of time devoted to market and non-market work, the wages and shadow wages of these activities, net transfers from other family members, net transfers from government, and net transfers of unpriced environmental services.

Let  $w_i^m$  = market wage for individual  $i$

$W_i^h$  = shadow wage estimate of value of non-market work (discussed later in more detail)

$w_i^m M_i$  = personal market wage times hours of market work or earnings

$K_i$  = personal income from capital

$w_i^h H_i$  = value of goods and services produced for own consumption

$F_i$  = net transfers from family members

$G_i$  = net transfers from government

Two variables not included in this model but could easily be added (and will be added at a later date) are:

$E_i$  = net environmental services (establishing the parallel between unpriced labor and unpriced environmental services)

$K_i$  = income from capital

Setting these aside for the time being,

2) In implicit form,  $Y_i = y_i (w_i^m, M_i, w_i^h, H_i, F_i, G_i)$

For the purpose of simplicity here, I treat income as a simple additive function:

3)  $Y_i = w_i M_i + w_{hi} H_i + F_i + G_i$

### **The Value of Non-Market Work**

With the availability of time-use data making it possible to examine the individual allocation of time to non-market work have come a plethora of estimates of the value of this work, usually imputed by multiplying the number of hours worked by a shadow wage rate (as indicated in equation 3). It is generally accepted that, for the purpose of national income accounting, a quality-adjusted replacement wage rate is desirable (Abraham and Mackie 2005). When modeling individual choice, an opportunity-cost estimate may be more appropriate. Some of the methodological issues at stake concern the accurate measurement of time use (conventional measures largely ignore supervisory constraints) and the choice of appropriate wage rate. A number of studies using such calculations suggest that non-market work represents between a third and a half of the size of Gross Domestic Product, as conventionally measured.

An alternative approach to valuation, the “output” approach, asks what it would cost to purchase the output (rather than merely the labor input) in the market. For instance, one could value a hamburger cooked at home at the cost of purchasing a hamburger of comparable quality at a restaurant. Subtraction of the costs of non-labor inputs (including ingredients and the cost of energy for cooking) yields an estimate of the value of non-market labor.

As has often been observed, failure to assign any value to non-market work leads an upward bias in measures of economic growth when market work displaces it. When a woman goes to work at a fast-food restaurant, her contribution to Gross Domestic Product is measured by her wages but the resulting reduction in the number of hamburgers she cooks for her family at home is not.

It is important to note that the value of non-market work—measured by any standard other than opportunity cost—varies far less than market wages. As a result, most imputations of the value of non-market work have an equalizing effect on living standards. Compare an economy based on two-adult households, in which one of the two adults specializes in non-market work, with an economy based on two-adult households in which both adults earn market wages. Particularly in a



country like the U.S., where wage inequality is significant, increases in market employment are likely to have a disequalizing effect (Folbre et al. 2013).

Individuals living alone do a fair amount of non-market work that is relevant to their living standards—a bit analogous to Robinson Crusoe on his island, who was the source of both demand and supply, and not only had to catch his own food but also to cook it.

However, much non-market work takes places in households and is directly or indirectly devoted to meeting the needs of other people. In this sense a metaphor such as “Swiss Family Robinson” fits better than Robinson Crusoe, and one could think of “household demand for non-market services” as a form of demand intermediate between individual demand and aggregate demand.

In equation 3 above, the value of non-market work is also embedded in family transfers.

Note that two elements on the right-hand side, wage income ( $w_i M_i$ ) and net government transfers ( $G_i$ ) are typically considered components of the demand for goods and services.

The other two elements represent supply-constrained quantities, determined by individual preferences and bargaining rather than subject to market forces that might drive it toward equilibrium. For instance, a husband might prefer that his wife cook dinner for the family, rather than spending additional money to eat out. A wife might prefer her husband to help out with household chores rather than devote more hours to wage employment. Similar, a child might prefer parental care to care outside the home. Whether or not these members of the family are able to satisfy their preferences depends on whether other family members are willing to supply them.

One could argue, however, that both the demand for and supply of spouses and children affect such bargaining outcomes, with implications for some process of equilibration. For instance, if the demand for wives is far greater than the supply, wives may be able to offer a lower level of household services than they would otherwise; one could interpret the family transfers that a full-time homemaker receives ( $F_i$ ) as a kind of “quasi-wage” for the unpaid work they do ( $H_i$ ) (Grossbard Schectman 1993; Cherry 1998). In other words,  $w_{hi}$ , or the replacement cost value of unpaid work is not necessarily equal to the net intra-family transfers actually received by the person doing that work.

### **A Household Production Function**

Both equation 3 and the discussion above skirt a basic problem: much non-market work involves utilization of significant amounts of household-specific capital (such as stoves, vacuum cleaners, baby cribs, and computers), yields household public goods, and is almost certainly characterized by economies of scale and joint production. The marginal cost of including another person in a home-cooked meal, for instance, is clearly smaller than the marginal cost of taking them to a restaurant. And for families with children, in particular, the benefits of unpaid work at home are enhanced by the ability to multitask: cooking dinner while keeping an ear out for children playing in the backyard.

In other words, household production cannot be accurately described as a simple linear product of unpaid work hours and an imputed wage, but should be conceptualized as an implicit function of unpaid work hours, household capital, household technology, market income, and the composition of output, among other factors. It seems likely that this household production function is typified by substantial economies of scale. For instance,

Let

$O_i$  = market value of non-market output produced by individual  $i$

$V_i$  = a vector of other factors relevant to household production of individual  $i$ , including household capital, household composition, household and community technology, etc.

4) In implicit form,  $O_i = o_i(H_i, V_i)$

Where doubling all quantities on the right hand side leads to a greater than doubled increase in output.

Economies of scale are of particular concern for accurate measurement of living standards across households of different size and composition, discussed later in more detail.

Equation 4 can be substituted for  $w_{hi}H_i$  in equation 3, but that substitution has no immediate implications for the following discussion of the other terms in that equation.

### **Net Transfers from Family Members**

In equation 3), the term  $F_i$ , net transfers from family members, represents a significant departure from conventional accounting models, which ignore intra-family transfers of both time and money.

Transfers to individual  $i$  can take the form of money transfers, direct purchases of goods purchased by others and consumed by individual  $i$ , direct inputs of non-market work time of which individual  $i$  is the sole beneficiary, and some share of the value of family-produced goods/services (some of which are non-rival in consumption), which is a function of both non-market labor inputs and purchases of capital and consumer goods.

Transfers to other family members can take the same forms: money transfers, direct purchases of goods for some other family member, direct inputs of non-market work time to other specific individuals, and some share of the value of family-produced goods/services. Rather than enumerating these terms directly, for simplicity, I designate net transfers from family members as the difference between what individual  $i$  transfers to the family and what individual  $i$  receives from the family. This formulation can be applied later to an analysis of bargaining power and inequality within the family.

$F_{ij}$  = what individual  $i$  transfers to family  $j$

$F_{ji}$  = what family  $j$  transfers to individual  $i$

$$5) F_i = F_{ij} - F_{ji}$$

Net family transfers are analogous to the conventional concept of “disposable income” (income net of taxes and government benefits), extended to the family; the “disposable income” of individual  $i$  is calculated net of their contributions to and from other family members.

For purposes of comparing net transfers to family members both among individuals and over time, it is useful to look at its size relative to individual income and relative to individual hours of work, such as  $F_i/Y_i$  and  $F_i/(M_i + H_i)$ .

### **Why Intra-Family Transfers are Important**

That net overall transfers from families to individuals over the lifecycle have not been studied in great detail may be attributable to an implicit assumption that they have expected value of zero. Perhaps individuals give back to their families approximately what they receive from them, subject to random variations attributable to demographic and economic luck.

Lifecycle effects are obviously relevant, with transfers from family members influenced by age, health, and life span. That is, we expect children to be net recipients of both cash, in-kind transfers, household public goods (such as a home), time directly devoted to their care, and time devoted to provision of family public goods (such as a clean home). We expect working-age adults who become parents to become net providers of such transfers to children, and all adults to provide resources, to sick, disabled or elderly family members who are in need. By the same token, adults who are sick, disabled or elderly in need of assistance often expect net transfers from family members.

The interconnections between transfers based on gender and age complicate the picture. Men provide more cash income for families than women do, while women provide more unpaid work. Women put more time and energy and financial resources into childrearing than men do, but typically receive more support and assistance from adult children (in part because they are more likely to live longer than men).

The difficulty of measuring and comparing resource flows that take disparate forms (money, in-kind transfers, time) contributes to a tendency to avoid the question. Some transfers are not easily quantifiable, and, with childrearing in particular, a quality/quantity tradeoff comes into play. That is, modern families typically raise fewer children than the previous generation, but devote more time and money to those they do raise.

The appropriate measurement of  $F_i$  as well as its determinants will be discussed later in more detail.

### **Government Transfers**

A second departure from conventional accounting models in equation 3) comes in the treatment of net government transfers,  $G_i$ . As aforementioned, net government benefits are usually

estimated simply as the difference between taxes paid and cash benefits received. In this model, parallel with the treatment of family transfers above, I treat these transfers more broadly—and symmetrically with transfers from family members—as the difference between what individual  $i$  transfers to the government and what the government transfers to individual  $i$ .

Rather than defining transfers to government simply as taxes, as in conventional model, I will include contributions to the development of human capital that yields future tax revenues (discussed later in more detail). Transfers from government to individuals are not limited to cash or in-kind goods but can also take the form of in-kind services (such as health insurance, education and child care) and a share of public goods/services such as roads, bridges, military defense, etc.

$G_{ij}$  = what individual  $i$  transfers to government  $j$

$G_{ji}$  = what government  $j$  transfers to individual  $i$

$$6) G_i = G_{ij} - G_{ji}$$

The appropriate measures of  $G_i$  as well as its determinants are discussed later in more detail.

### **Why Net Government Transfers are Important**

Lack of attention to net government transfers over the lifecycle parallels the lack of attention to net family transfers, perhaps because many government transfers are similarly motivated by concerns about the needs of dependents, often treated as a matter of personal preferences or moral values. Yet even transfers that are motivated by altruistic concerns should be informed by accurate estimates of their cost, which is determined in part by reciprocal future transfers. That is, even someone committed to paying taxes in order to support a fellow citizen in need would probably like to know what their likelihood is of being “paid back” by future support offered to them.

Recipients of government transfers are often derogated as dependents, as in presidential candidate Mitt Romney’s claim that families not paying income taxes (approximately the bottom 47 percent of all families) represent “takers” rather than makers.

Apart from the rather conspicuous mis-measurement of total payments in the U.S. (which include Social Security or employment taxes, sales taxes, and property taxes as well as income taxes and are paid by virtually the entire population) this claim is based on a misleading cross-sectional comparison: most families receiving net transfers in the U.S. have children or other dependents; net transfers from government to working age adults who are not caring for dependents are generally quite small. As the model above suggests, net government transfers (like net family transfers) should be measured over the lifecycle, not at one point in time.

Some limited efforts at “intergenerational accounting” in the U.S. reach for such a lifecycle analysis, but confine their attention to relative tax rates, with no attention to relative benefits, which include not only family-specific and individual-specific transfers, but also access to public goods created and maintained by government (Kotlikoff and Burns 1975).

The model above makes it easy to specify the terms under which an individual is a net beneficiary of government transfers, and to compare the extent to which different individuals may benefit. It also makes it easy to explore the relationship between intra-family transfers and government transfers.

### **Individual Consumption and Investment**

Having defined the components of expanded income in some detail, it is useful to consider which elements might be considered consumption, and which investment.

Some implications are obvious: both consumption and investment will be bigger in this model than in the traditional model, because they include both unpaid work and intra-family transfers.

Consumption is defined to include market purchases, goods and services produced for own consumption and goods and services provided by other family members or government. In parallel fashion, investment is defined to include both priced and unpriced assets. Individual  $i$ 's consumption is defined as the difference between that individual's net income and their investment in individually owned assets.

I define all transfers to children under the age of 18 as a form of investment, along with all transfers after that age directly related to the acquisition of new skills (such as college tuition and support for study). These transfers include expenditures of cash but also the value of non-market work devoted to the care and nurturance

Let

$C_i$  = consumption of individual  $i$  (including unpriced goods and services)

$I_i$  = investment of individual  $i$  in individually owned assets (tangible and intangible, priced and unpriced) and in others, including children.

$$7) C_i = Y_i - I_i$$

The designation of expenditures on children as investment represents a major departure from conventional models. Further, it raises some ambiguities regarding the distinction between consumption and investment that arise from the "human capital" metaphor.

One could argue that consumption itself represents a cost of maintaining human capital—a point implied by Karl Marx when he described wages as a cost of the "reproduction of labor power." (For more discussion of the Marxian approach to human capital see Folbre 2012).

Indeed, spending aimed to maintain the basic health and productive capabilities of adults, including the elderly, clearly has an investment component analogous to spending on children—perhaps best described as maintenance to reduce or slow depreciation.

One strategy for dealing with this issue would be to distinguish between investment in children, which is analogous to investment in new capacity, and investment in adults, represented as maintenance.

I pursue a slightly different strategy here, though one could argue that it differs only in nomenclature, distinguishing between “necessary consumption” (which represents maintenance) and other consumption, labeled as “other consumption.”

I choose this nomenclature because it echoes an existing literature that focuses on consumption necessities such as food, shelter, and medical care. The U.S. Census Bureau has developed a set of experimental poverty measures, based in part on the distribution of actual spending on basic needs expenses, which represent a good example (for more discussion see the following U.S. Census Bureau website: <http://www.census.gov/hhes/povmeas/>).

The distinction between consumption of necessities and luxuries makes little sense within a neoclassical framework, since individuals have different preferences and only they can rank these in importance. However, many institutional rules for family support assume that some measure of “basic need” can be specified. For instance, the Anglo-American tradition of family law holds spouses responsible for the basic support of one another, a requirement that has been interpreted to mean fulfillment of basic needs (as distinct from equally sharing income). Similarly, laws governing the family support of aging parents are framed in terms of meeting their basic needs (Moskowitz 2002).

Let  $C_{ni}$  = necessary consumption of individual  $i$

$C_{li}$  = other consumption of individual  $i$

$$8) C_i = C_{ni} + C_{li}$$

This distinction pertains to both consumption that takes the form of market expenditures, and that based on direct consumption of unpaid services. That is, it implies that some non-market time devoted to family members represents a necessity, and some does not.

The definition of both consumption and investment is further complicated by the consideration of intra-family transfers. The total consumption financed or enabled by individual  $i$  includes not just her or his own consumption but also that of family members who may have received a transfer from that individual (and, more indirectly, that transferred to others through government).

Likewise, the total investment financed by individual  $i$  includes not only her or his investment in individually owned assets, but also investments they made in other family members, primarily children (parts of which may be captured by the individual investor, other adult family members, children themselves, or the government, as indicated in later discussion).

### **Accounting Implications**

The framework above helps specify a number of important questions relevant to measurement of living standards, macroeconomic theory, and public finance that typically go unasked, but have clear implications for empirical research. I hope that the juxtaposition of important questions from these three different but related areas, can help develop a more consistent, unified research agenda. The following are not ranked in order of importance, nor do they represent an exhaustive list. Each question in each subsection is followed by brief review of existing empirical or theoretical research.

### **Living Standards Measurement**

1. How has the value of unpaid work, imputed by multiplying hours worked by a replacement cost wage, changed over time relative to paid work?
2. How does the imputed value above differ from one based on estimates of a household production function that includes the value of household capital and technology?
3. How does the distribution of extended family income (that is, market income plus the value of non-market work) compare to the distribution of market income?
4. How have changing economies of scale in unpaid work affected the relative wellbeing of parents and non-parents?
5. How do adult consumption levels vary between parents and non-parents?
6. How are the costs of caring for dependents distributed between men and women?

### **Macroeconomic Theory**

1. How are estimates of the rate of economic growth modified when the value of unpaid work is included in an estimate of total output?
2. What are plausible estimates of private and public investments in children, and how have these changed over time?
3. How have investments in children changed relative to investments in physical and financial capital over time?
4. What is the rate of return on investments in children, and how (and by whom) is it captured?
5. How does the propensity to consume necessities differ from the propensity to consume other goods and services, both across households and over time?
6. What is the elasticity of substitution between paid work and unpaid work, and how has it changed over time?

## **Public Finance**

1. How can estimates of net lifetime benefits from public spending be constructed from available data?
2. Are net transfers from government more strongly related to age, gender, and family relationships or to income? That is, does government primarily redistribute from families consisting of workers to those supporting dependents, or from rich families to poor ones?
3. Have net lifetime transfers from government increased or decreased over time relative to individual income?
4. What is the relationship between family transfers and government transfers—to what extent do they substitute for one another? Do government transfers crowd out family transfers?
5. What is the optimal mix of public and private transfers?



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