Investment, consumption, or public good? Unpaid work and intra-family transfers in the macro-economy

Este artículo plantea la necesidad de una integración más adecuada de la dinámica familiar y de mercado. Comenzamos con una visión panorámica de las inconsistencias conceptuales en los modelos neoclásicos convencionales. A continuación, esbozamos algunos rasgos característicos de la economía familiar que merecen ser tomados en consideración para, con ellos, desarrollar una valoración crítica de tres tipos diferentes de modelos: los marcos contables (incluyendo las matrices de contabilidad social), los modelos neoclásicos de crecimiento que asumen utilidades conjuntas (que en general dan lugar a resultados socialmente óptimos), y los modelos neoclásicos que ponen en cuestión los procesos de toma de decisiones intergeneracionales, comúnmente llamados modelos de generaciones superpuestas. Defendemos que estos últimos, al menos, aportan alguna palanca conceptual hacia modelos más satisfactorios. Concluimos con una descripción de algunas propuestas sobre cómo podrían mejorarse.

Artikulu honetan azaltzen da familiaren eta merkatuaren dinamika hobeto integratu behar dela. Hasteko, ohiko eredu neoklasikoek dituzten funsgabetasun kontzeptualen ikuspegi panoramikoa atera dugu. Ondoren, famili ekonomiaren ezaugarri berezi batzuk gainetik azaldu ditugu, baina soilik hiru ereduren balorazio kritikoa egiteko kontuan hartzeko modukoak diren ezaugarriak. Hiru eredu horiek dira: esparru zenbakarriak (gizartearen matrize zenbakarriak barne); hazkundearen eredu neoklasikoak, erabilera bateratuak dituztenak (oro har gizarteak onartzen dituen emaitzak dituzte); eta belaunaldiarteko erabakiak hartzeko prozesuak zalantzan jartzen dituzten eredu neoklasikoak, belaunaldi gainjarrien eredu bezala ezagutzen direnak. Azken horiek, gutxienez, kontzeptu-euskarriren bat eskaintzen diete eredu onenei. Amaitzeko, hobetzeko moduari buruzko proposamen batzuk azaldu ditugu.

This paper outlines some preliminary steps toward a more satisfactory integration of family and market dynamics. We begin with a broad overview of conceptual inconsistencies in conventional neoclassical models. Next, we outline several distinctive characteristics of the family economy that deserve consideration. We use this outline to develop a critical assessment of three very different types of models: accounting frameworks (including social accounting matrices), neoclassical growth models that assume joint utility (which typically generate socially optimal outcomes), and neoclassical growth models that problematize family decision making between the generations, often dubbed overlapping generation models. We argue that overlapping generation models provide at least some conceptual leverage for more satisfactory models, and, in our conclusion, we outline some ways in which they could be extended.

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1. INTRODUCTION

Once upon a time, population growth was treated as exogenous to economic growth. Today, some national statistical offices construct satellite income accounts that include estimates of the value of non-market work as well as human capital accounts highlighting expenditures on education and health. Likewise, many macroeconomic models incorporate decisions regarding family size and expenditures on children. Yet many of these efforts appear inconsistent with one another, treating expenditures on children as both investment and consumption, and characterizing future workers sometimes as private, sometimes as public goods. Further, many of these efforts are based on highly stylized and unrealistic assumptions.

These inconsistencies and ambiguities can be traced to a long-standing reluctance, deeply rooted in both classical and neoclassical economics, to acknowledge the importance of family work to the economy as a whole.

The classical tradition has long drawn a sharp line between the production of use values and exchange values, currently reflected in standard national income accounting categories that place unpaid family work outside the «production bounda-

ry». The neoclassical tradition has long treated the family primarily as a site of altruistic utility maximization.

Most macroeconomic models in the Keynesian and Post-Keynesian tradition largely ignore population dynamics. Some neoclassical models include them, often (though not always) deploying stylized assumptions that guarantee socially optimal equilibria. The scope for using macroeconomic models to explore problems such as below-replacement fertility, excessive population growth, divergences in child outcomes, gender inequality, and family dissolution remains quite limited.

In this paper we outline some preliminary steps toward a more satisfactory integration of family and market dynamics. We begin with a broad overview of conceptual inconsistencies in conventional neoclassical models. Next, we outline several distinctive characteristics of the family economy that deserve consideration. We use this outline to develop a critical assessment of three very different types of models: accounting frameworks (including social accounting matrices), neoclassical growth models that assume joint utility (which typically generate socially optimal outcomes), and neoclassical growth models that problematize family decision making between the generations, often dubbed overlapping generation models. We argue that overlapping generation models provide at least some conceptual leverage for more satisfactory models, and, in our conclusion, we outline some ways in which they could be extended.

2. CONCEPTUALIZING THE FAMILY ECONOMY

We use the term «family economy» to describe both unpaid work and transfers of goods, services, and money to biological or social kin that take place outside the market and the state. These activities and transfers represent a central aspect of the larger care economy and the process of social reproduction. Analysis of the family economy requires attention to the ways in which unpriced services are combined with purchased inputs to produce both priced and unpriced outputs.

2.1. A General Critique

The starting point of virtually all long-run macroeconomic growth models is an effort to explain the growth of market output, or Gross Domestic Product (GDP). Yet non-market output, valued at replacement cost, adds up to a significant percentage of GDP, typically more than 40%. As has long been noted, this definition of output implies that a reallocation of labor from non-market to market production (all else equal) increases GDP, even if the total value of goods and services produced remained unchanged. As a result, historic increases in women's labor force participation have probably led to divergence between the growth of GDP and total output, because neither declines in the quantity of non-market work nor possible changes in its productivity have been factored in.

Hence the importance of accounting models that offer estimates of the value of non-market work, based on methodologies consistent with national income accounting standards. Such estimates remain incomplete for several reasons: they don't include specific consideration of the impact of either physical or human capital in household production, and they do not assign a value to unpriced outputs such as improved health or human capabilities. Nonetheless, they provide a more accurate estimate of total output than traditional assumptions, which effectively assign a value of zero to non-market inputs and outputs. In this respect, efforts to account for the value of family production resemble efforts to account for unpriced environmental assets and services.

An ideal macro model would seek to measure the growth of total output, not merely priced outputs. But efforts to improve measurement can be complemented by improved models of the growth of total output and the impact of measurable family inputs and outputs on GDP. Factors such as population growth, hours of unpaid work devoted to housework and care services, and educational and health outcomes deserve immediate consideration because they can be currently measured.

Population growth has obvious implications for the size of the paid and unpaid labor force, and vice versa. Increases in the paid labor force participation of women have particularly obvious implications for fertility, as they raise the opportunity cost of women's time. Average fertility rates have declined considerably and are now close to or below replacement levels in most of the advanced capitalist countries.

Early macro models in both the Keynesian and neoclassical tradition (such as the basic Solow model) typically assumed an exogenous rate of population growth. However, some more recent models endogenize at least some aspects of demographic change, incorporating models of family utility maximization in fertility decisions based largely on the work of Gary Becker.

The distinctive features of the family utility function explain much of the ambiguity in treatment of expenditures on children noted in the title of this paper. In the Beckerian model, families maximize a joint utility function in which expenditures of time and money on children offer a flow of future utility in the form of «child services». In this respect, children are analogous to consumer durables. That is, they represent a form of consumption.

Parents derive utility not just from the quantity, but also the «quality» of children, defined simply as the level of expenditure per child (typically assumed equal for each child in the family). In dynastic utility functions, parents are presumed to correctly anticipate the utility they will enjoy, not just from their own children, but their children's children, etc. Holding their preferences constant, changes in fertility and expenditures per child are driven by changes in prices and incomes.

Expenditures on children are often described as parental «investments» but they differ from investments in the market economy, which are based on anticipated

market rate of return determined, in equilibrium, by a production function. Family investments in children yield utility, and such utility is linked to the wages of future adults that finance their consumption, and that are in turn linked to their fertility. The possibility that fertility might decline to below-replacement levels is seldom acknowledged. Macroeconomic trends affect fertility, but fertility does not generally affect macroeconomic trends. This asymmetry goes largely unremarked.

However, it raises the question of what would happen to the growth of the labor force if preferences for children or the link between «child quality» and children's future earnings changed over time. Indeed, the disjuncture between parental motives in raising children and the actual supply of productive capabilities to the market economy represents an externality, in the sense that it is an unintended result of private decisions.

Another example of this disjuncture is provided by macro models that incorporate human capital (but not fertility decisions). In this context human capital is defined as educational attainment, distinct from the costs of producing the body and mind that attain it. The market rate of return to human capital is often equated with the difference in productivity between more-educated and less-educated workers. «Investment in human capital» is defined as public and private educational expenditures.

This is inconsistent with other definitions of investment. For instance, the costs of programming a computer can be distinguished from the costs of producing the hardware. But the costs of producing the hardware (analogous to the costs of producing an adult person) would certainly be considered investment. Similarly, a rancher raising livestock would typically consider the costs of feeding, housing and caring for the herd as investment. No one argues that only a subset of expenditures —those that determine the difference in the relative prices of trained and untrained horses, for instance— represent investment.

A growing literature that attempts to value national stocks of human capital ignores the cost of producing it, focusing only its anticipated future returns (Dale Jorgenson and Barbara Fraumeni, 1989). These are typically defined as the net present discounted value of the difference in earnings between educated and non-educated workers. The costs that families incur in producing the units that attain human capital can be ignored because they are treated as a consumption yielding utility, just like expenditures on recreational vehicles or pets.

But this «consumption» creates something —adults with productive capabilities— that typically outlast those who are presumably consuming their services, namely parents. Treating parental commitments to children purely as a utility maximizing decision provides a fancy way of sidestepping the reality that labor, like capital, is a produced factor of production. It arrives at essentially the same result as the much simpler —though equally misguided— classical assumption that the adult worker can be taken as given like some unpriced natural asset, and requires only wages to pay for maintenance.

2.2. **An Alternative Approach**

The standard classical (including Marxian) view is that families function so differently from firms that they cannot be analyzed in similar terms (Nancy Folbre, 1982). The standard neoclassical view veers to the opposite extreme, assuming utility maximization based on perfect information, typically leading to socially optimal outcomes.

In our view, neither view is correct. Integration of the family economy into the larger economy requires careful attention to its distinctive characteristics, which we summarize in three general propositions: 1) Labor, like capital, is a produced factor of production even if the motives underlying its production are distinct 2) «Human capital», defined as the augmentation of skills by education, represents a subset of the larger development and maintenance of human capabilities that have intrinsic as well as productive value 3) Family decisions are shaped by social institutions that influence asset distribution, legal rules, and cultural norms.

Several motivational and technical characteristics of the family economy —not necessarily unique, but conspicuously salient within it— also deserve consideration.

Motivational characteristics. While some unpaid work simply represents production of goods and services for own production, much of it is either conducted on behalf of others or creates positive spillovers for them. The intentional provision of goods and services for others is typically motivated by some combination of self-interest, altruism, hope of reciprocity, and social obligation. The complexity of mixed motivation distinguishes our approach to the family economy from one based purely on altruistic preferences.

Precisely because motivations for family work and transfers are affected by implicit contracts governing reciprocity and norms of social obligation, as well as individual preferences, they cannot credibly be held constant. There is good reason to believe that motivations —or, more specifically, objective functions— are a partially endogenous feature of the larger process of economic change.

Three specific propositions flesh out this motivational endogeneity:

1. Individuals within the family may have different and conflicting preferences, as well as different levels of bargaining power reflected in their fall-back positions should they choose to exit family commitments. In other words, changes in the relative bargaining power of family member modify their collective objective function. However, altruistic preferences and emotional attachments shape family decisions and family members often enjoy gains from collaboration. Amartya Sen's term «cooperative conflict» provides a concise rubric (Amartya Sen, 1997).
2. The relative bargaining power of individuals is influenced by many dimensions of their social identity, such as their gender and age. Extra-household institutional arrangements, including employment opportunities, legal rules,

and public policies, influence fallback positions based on social identity, introducing an element of collective as well as individual negotiation within the family economy. For instance, men or the elderly as groups may mobilize to develop or enforce social institutions that strengthen their individual bargaining power (Folbre, 1998).

3. While legal rules and social norms both enforce some contractual obligations to family members, many dimensions of reciprocity among kin are governed by relatively unstable implicit and imperfect contracts. Parents sometimes default on obligations to children (as well as vice versa) and adults (whether legally married or not) sometimes default on their commitments to one another (Folbre, 1994).

The family economy also has technical characteristics that, while certainly not unique, have particularly significant implications for its social organization and almost certainly help explain its distinctive motivational characteristics:

1. The scope for voluntary exchange in families is limited. Children do not choose their parents, and parents who find their children difficult are generally unable to exchange them for others. Families cope with dependency at both ends of the lifecycle (infancy and senility) and during unexpected periods in between (ill health or disability). In neoclassical terms, families experience «missing markets».

2. Because families may extend indefinitely into the future, current family members hoping to ensure the wellbeing of their descendants suffer from significant information problems. It is difficult, if not impossible, for them to know what kinds of challenges their offspring will face.

3. Care of dependents in general and children in particular creates significant externalities. These are generally positive: The development and nurturance of human capabilities creates a resource that potentially benefits employers, taxpayers, friends, and neighbors. One specific positive externality arises from the logic of sexual reproduction: parents who hope for grandchildren rely on the availability of a partner for their own children (Frances Woolley 2000). Negative externalities can take the form of social costs and environmental impacts.

3. A CRITICAL REVIEW OF MACROECONOMIC MODELS

The list developed above provides a way of organizing a critical review of three very different approaches to integrating the family economy into the larger economy: accounting models, neoclassical growth models that assume joint utility, and neoclassical growth models that either ignore family decision-making or treat it as

problematic. The matrix in Table 1 also provides a way of highlighting the features of existing models that show some potential for revision. We restrict our attention to models that explicitly recognize at least some role for the family economy, including fertility decisions.

Table 1. **CHARACTERISTICS OF THE FAMILY ECONOMY RECOGNIZED IN MACRO MODELS (blanks denote «not applicable»)**

	Accounting Models	Neoclassical Growth Models Assuming Joint Utility	Neoclassical Growth Models NOT Assuming Joint Utility
General characteristics			
Labor is «produced»	Yes	Partly	Partly
Output includes human capabilities	Yes	Potentially	Potentially
Influenced by social institutions	Yes	No	Potentially
Motivational characteristics			
Cooperative conflict		No	Potentially
Group bargaining power		No	Potentially
Imperfect contracts		No	Potentially
Technical characteristics			
Missing markets		No	Yes
Imperfect information		No	Potentially
Externalities	Yes	No	Potentially

Source: Our elaboration.

Some of the row criteria are not applicable to accounting models, in which case cells are left blank. The term «potentially», which appears in some cells, represents a judgment on our part of potential adaptation or revision, which explore in the next section. As is apparent from the matrix, we see considerable potential for extending and improving overlapping generation models (OLG) by including consideration of collective and individual bargaining between parents and children, parents and non-parents, mothers and fathers, as well as groups defined by class, race/ethnicity, gender, and citizenship.

3.1. **Accounting Models**

Macroeconomic theory helped define the basic categories of national income accounts, and relies heavily on them for empirical content. Neither the value of non-market work nor intra-family transfers are included in conventional accounts, which also exclude government transfers from Gross Domestic Product on the grounds that they are merely redistributive. A small but growing literature challeng-

es these omissions, offering estimates of their monetary value based on a variety of data sources, including nationally-representative time-use surveys.

We use the term «accounting models» to label this important genre of empirical work. In general, these static models rely on simple assumptions regarding technology and do not address dynamic change. Because their intent is largely descriptive, most of the categories of motivational and technical characteristics described in Table 1 simply do not apply. However, they provide valuable illustrations of the three general characteristics of the family economy that we emphasize.

A number of empirical studies estimate the value of non-market work in the U.S. based on valuation of labor inputs (Steven Landefeld, *et al.*, 2009; Benjamin Bridgman *et al.*, 2012; Nancy Folbre and Jooyeoun Suh, forthcoming). This parallels the national accounting practice of assigning a value to government largely based on input costs. Replacement cost valuations (what it would cost to hire someone to provide work of comparable quality) reflect the tradition of classical political economy embedded in national income accounts. That is, they make no claim to measure utility (ignoring, for instance, consumer surplus) but rely on quasi-market prices.

By contrast, opportunity cost valuations (what a person could have earned had they devoted that time to an alternative activity such as paid employment) are often embedded in a utility maximization framework. One alternative to valuation of labor inputs, the output valuation method, asks what the service provided would cost if purchased, then estimates (if possible) the relative contribution of labor, capital, and raw materials. This requires data on household capital and expenditures that is often hard to combine with data on labor inputs.

The differences between these three valuations methods are not always clear in practice. Consider, for instance, the valuation of unpaid childcare. A replacement-cost approach might multiply the number of hours of parental childcare times a nanny's wage, or, in a more sophisticated approach, multiply a vector of hours devoted to different types of child care activities times a vector of different wage rates. An opportunity-cost approach might ask parents could have earned if they had devoted that time instead to child-care. An output-valuation approach might ask what it would cost the family to pay the full market price for childcare outside the home, netting out the payment for use of facilities and food. Yet one could also construe the cost of paid child care as the opportunity cost of not providing parental care at home, and the cost of a child care worker's salary (rather than a nanny's salary) can be used in replacement cost valuations.

All valuation methods suffer from serious limitations. Measurement of labor inputs relies heavily on data from nationally representative time-use survey data. In these surveys, measurement of non-market work is not always consistent, because child care (a large component of non-market work) involves considerable supervisory responsibility as well as active care. Neither of the labor input valuation methods acknowledges

the contributions of factors such as capital or raw materials to the value of unpaid services, and the output valuation method has proved difficult to apply in practice.

As a result, most valuations of unpaid family work implicitly assume a linear household production function in which labor is the only factor. They also largely ignore other complications such as joint production, economies of scale, and lack of perfect substitutability between family and market-purchased inputs. One might even conclude that the assumption of a linear household production function has no more foundation in reality than the standard Cobb-Douglas production function deployed in more theoretical micro and macro-models.

Whatever their limitations, accounting efforts clearly demonstrate the significant proportion of labor time —about 50% of total labor time in the U.S. for instance— devoted to non-market work. They also show that a significant percentage of this time is devoted to the direct care of children and elderly family members. Studies of inputs into child development (measured by, for instance, educational outcomes) show that both parental time and money make a significant contribution to children's capabilities. Mothers provide significantly more time than fathers to family care.

Overall, women devote far more time to non-market work than men do.

Studies of women's labor supply clearly demonstrate that fulfillment of such family responsibilities reduces women's supply of hours to paid employment and thus reduces the overall supply of labor to the market. Such responsibilities also significantly reduce the earnings of mothers relative to women without children, as well as relative to men.

Time-use data offer opportunities for measurement and valuation of unpaid work that can be combined with data on expenditures on children and other dependents to examine the size of total private transfers (Folbre, 2008, 2012).

The distribution of these expenditures between mothers and fathers, women and men can also be ascertained. From an intergenerational perspective, private spending on children can be characterized as an investment that can provide direct benefits to parents directly through intra-family transfers of time, and/or money as parents age. As emphasized above, however, much of the return to investments in children extends beyond the family.

The public sector is the site of enormous intergenerational transfers. Spending on children, which can be characterized as investment, takes the most conspicuous form of public education, but cash and in-kind transfers to families with young children also play a prominent role (Folbre, 2008). Many of the public goods aspects of public investment cannot be assigned to particular age groups. On the benefit side, investments in children are more than recouped through public pension programs and debt repayment, as well as more diffuse public good effects (Douglas Wolf *et al.*, 2011; Antoine Bommier *et al.,* 2010).

«Gender budgeting» examines the distribution of net public benefits between men and women. «Age budgeting» examines their distribution between age groups. One does not need to accept all the assumptions embedded in such empirical efforts to recognize that they extend concern with intra-family inequalities based on gender and age to the economy as a whole.

Data from these diverse sources could be used to construct an expanded accounting system defining extended household income as the sum of market income or wages, the imputed value of home production, and net transfers from government. Extended household income can be divided into consumption, savings, and investment in human capabilities, primarily but not exclusively spending on children (Folbre, 2014).

This implies a more complex circular flow than standard macroeconomic models rely on, because the household becomes a site of production as well as consumption, and the «labor force» becomes a subset of a larger category of human capital, in turn a subset of human capacities and capabilities.

Current accounting terminology refers to «transfers» that take place both within the family and the state, a term that is not inaccurate, but implies that they merely represent redistribution. This treatment is inconsistent with the ubiquitous reliance on the term «human capital» within economic theory. Transfers within both the family and the state to children should be treated as investments.

This raises important questions about other dimensions of consumption, such as expenditures that help maintain the stock of human capital, which could be interpreted as a form of depreciation. We hope to explore these questions further at a later date.

Table 2. **A SIMPLIFIED STANDARD SOCIAL ACCOUNTING MATRIX**

	Firms	Households	Government	Net Investment	Total Receipts
Firms		C	G_f	I	$C+ G_f +I$
Households	W		G_h		$W+ G_h$
Government	T_f	T_h			$T_f + T_h$
Net Investment		S_h	S_g		$S_h + S_g$
Total Expenditure	$W + T_f$	$C+ T_{h+} S_h$	$G_f + G_h + S_g$	I	

C=consumption, G=Government, I=Net Investment, G=Government, W=Wages, S=Savings, T=Taxes; Subscripts f=firm, h=household, g=government

Source: Our elaboration.

The disaggregation of extended income could also be viewed in a simplified social accounting matrix (SAM) that describes expenditures and receipts, the supply of resources and their use. By way of reference, a simplified SAM for a domestic economy with no foreign trade is presented in Table 2. In this standard approach household income consists only of wages (W) plus government transfers (G_h); household consumption (C) represents only purchases from firms and what households do not consume is saved (S).

The extended model in Table 3 distinguishes between two dimensions of the households —one that earns market income (devoting some to consumption and some to savings) and one that produces goods and services for own production, consumes a portion of these, and invests a portion in household members. Extended household income consists of wages from the market (W_m), and implicit wages of non-market household work (W_h); extended household income consists of consumer goods purchased in the market (C_m) and the value of goods and services produced outside the market (C_h). Some market income is directly saved (S_{hm}) and may be invested in either household technology or household member capabilities that generate household income (I_m). Some portion of non-market production is directly saved in the sense that it is directly invested in developing the capabilities of household members (I_h).

Table 3. **A SIMPLIFIED EXTENDED SOCIAL ACCOUNTING MATRIX**

	Firms	Household Market	Household Non-Market	Government	Net Investment	Total Receipts
Firms		C_m		G_f	I_f	$C_m + G_f + I_f$
Household Market Activities	W_m		W_h	G_h	I_m	$W_m + W_h + G_h + I_m$
Household Non-Market Activities		C_h			I_h	$C_h + I_h$
Government	T_f	T_m				$T_f + T_m$
Net Investment		S_{hm}	S_{hh}	S_g		$S_{hm} + S_{hh} + S_g$
Total Expenditure	$W_m + T_f$	$C_m + C_h + S_{hm}$	$W_h + S_{hh}$	$G_f + G_h + S_g$	$I_f + I_m + I_h + I_g$	

C=Consumption, G=Government, I=Net Investment, G=Government, W=Wages, S=Savings, T=Taxes; Subscripts f=firm, h=household, g=government, m=market, h=non-market

Source: Our elaboration.

The extended SAM in Table 3 does not disaggregate flows between men and women, or parents and children, within households. However, additional rows and columns could easily be added to accommodate these.

The extended SAM in Table 3 also does not include a row or column for externalities; these could easily be added, though estimation of their actual values is more problematic. Another limitation is that it does not include direct consideration of leisure. Unlike a neoclassical approach based on utility maximization, where utility is a function of both income and leisure, this more classical approach draws on the analogies between production and «reproduction» with objective rather than subjective output.

However, this approach can take leisure and time available for personal care directly into account through analysis of time-use data. Measures of extended income can be divided by hours of work to arrive at a measure of «extended productivity». This measure would reveal the impact of improvements in household technology, socialization of childcare, and improved infrastructure on real living standards. Current accounting measures essentially conceal such effects.

One could also argue that the goal of macroeconomic development should not be growth in extended income (though this would certainly be a better goal than growth in market income), but rather growth in extended productivity, or the value of extended income per labor hour- a much better measure of productive achievement.

The accounting models described above set the stage for a dramatic revision of macroeconomic thinking. However, they say nothing about behavioral relationships that are key to understanding dynamic change in intra-family distribution, the distribution of resources across families, or the trajectory of economic growth. Hence the importance of considering what can be learned from existing neoclassical models and how they might be adapted to new purposes.

3.2. **Neoclassical Growth Models**

We use the list of characteristics of the family economy that may be recognized in macroeconomic models (Table 1) to examine the elements of two categories of dynamic neoclassical growth models. We distinguish between those that either presume a joint utility function and those that either ignore intra-family decisions or acknowledge exchanges governed by implicit or explicit contracts. In general, models in the first category also include infinite time horizons, and lead to socially optimal outcomes. Models in the second category, often falling under the rubric of overlapping generations (OLG) models, call attention to specific forms of intergenerational transfer and (not incidentally) do not necessarily yield socially optimal outcomes. It is worth noting, however, that the line between these two categories sometimes fuzzy, and some economists, notably Gary Becker, present models that fall into both.

In many neoclassical growth models in which labor is a produced factor of production, fertility choices are the outcome of optimizing a joint household utility function and therefore do not incorporate cooperative conflict or group bargaining. Utility comes directly from the desire to have children, indirectly from altruism felt towards future generations, or from the support children provide in old age through an implicit contract. Fertility outcomes are derived from balancing the utility benefits of having children with their costs. Costs are measured as the opportunity cost of time or foregone consumption.

One of the ironies of neoclassical growth models that incorporate some scope for family dynamics is that, with few exceptions, they require some form of non-self regarding preferences for economies to be sustained across generations. Most neoclassical decision-making is predicated on optimizing individual objectives firmly rooted in self-interest. Yet growth models that take population dynamics into account cannot work —i.e. economies cannot grow— if they rely solely on selfish motivations. The exception to this are models that assume perfectly (and costlessly) enforceable contracts between generations, so that parents are insured adequate payback for the time and money they spent raising children.

Robert Barro and Gary Becker (1989)'s model typifies the pure neoclassical approach. In their theoretical world, individuals act alone and maximize utility over an infinite time horizon based on their own consumption and the utility of their direct decedents. There is no conflict within families or between generations. Moreover, there is no gender division of labor, so that the costs of children are equal across individuals. An altruism parameter determines the weight given to the utility of these descendants. Altruism replaces the subjective rate of discount commonly used in these models. A high degree of altruism towards future generations is equivalent to a low rate of time preference, and a low degree of altruism corresponds to a high degree of discounting. If there is no altruism (pure self-interest prevails), the discount rate approaches infinity, there is no incentive to have children, fertility plunges to zero and the economy grinds to a halt.

The Barro and Becker approach shares much in common with the Ramsey class of growth models in which labor is typically treated as exogenous (Frank P. Ramsey, 1928; David Cass, 1965; Tjalling Koopmans, 1965). People, acting with perfect foresight and complete information, save now in order to consume later, over an infinite time horizon. In Barro and Becker, individuals allocate consumption across an infinite number of future generations. Having children is the mechanism whereby individuals spread consumption over time. Raising a child involves time and money that could be used to finance own consumption —by having children individuals are, in effect, saving and investing. That savings is transformed into future consumption when children become adults and make similar consumption and fertility decisions.

Welfare is measured purely in terms of utility, rather than the intrinsic value of the capabilities produced. The choices of consumption and fertility must represent a social optimum, in the sense that higher levels of utility cannot be achieved by changing the fertility decision.[1] In a departure from the actual world, there are no missing markets, externalities, or imperfect contracts. The benefits of having children are fully captured within the dynasties of the individuals making these private choices. Government only serves to distort. For instance, policies, such as public support that lowers the private costs of children, must result in sub-optimal outcomes. Family support policies that raise the fertility rate must represent an inferior outcome since individuals would have chosen that higher level of fertility freely if the decision to have more children would have increased their utility.

In these models, macroeconomic trends affect fertility decisions, but not vice versa. For instance, they ignore the possibility that the costs of children might become so high that many choose not to become parents, leading to below-replacement levels of population growth and hence a decline in the labor force. Such a presumably utility-maximizing decision could obviously have negative macroeconomic consequences. Yet because these models make assumptions such as constant returns to scale and fully self-financed consumption in old age, feedback from fertility decisions to macroeconomic performance and broader welfare outcomes never materializes. The possibility that potential parents are «priced out» of parenthood is not remote: in the U.S. today about 17% of white women between the ages of 40 and 45 remain childless, and the population growth rate remains above replacement level primarily because of the higher fertility of Hispanic immigrants.[2]

The class of models which Barro and Becker typify can be extended to include the production of human capabilities —although commonly restricted to the more narrow concept of human capital (Gary Becker, Kevin Murphy, and Robert Tamura, 1990). Individuals chose between own consumption, having additional children, or investing in the human capital of existing children —representing a «quantity v. quality» trade-off. This alters the costs of children in the sense that the opportunity costs of having children are lower in economies with low human capital endowments due to lower market earnings — hence fertility is higher—. Yet these models remain firmly in the neoclassical tradition: joint utility functions, equal distribution of the costs of children, no imperfect contracts, and perfect information.

When measured in terms of per capita income and consumption, changes in family decisions pose no problem for macroeconomic growth.

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[1] Barro and Becker (1989) discuss the possibility that we could assume that a theoretical social planner would be more altruistic than individuals (i.e. social preferences differ from private preferences). However, outcomes under the social planner and outcomes under private individuals would both be Pareto efficient – they would simply reflect different preferences.

[2] See Gretchen Livingston, «Childlessness», Pew Research Center, http://www.pewsocialtrends.org/2015/05/07/childlessness

The second column of Table 1 summarizes our assessment of this genre of neoclassical models. Consider row 1: Labor is «partly» produced in the sense that parents have a budget constraint and respond to changes in the cost of children. However, the links between parents' decisions to invest in children and the consequences for the macroeconomy are tenuous: macroeconomic change affects the outcomes of utility maximization, but fertility decisions remain largely a by-product of the dynamics of capital accumulation. In this sense, the family and the macroeconomy are not fully integrated.

The family utility function could easily be modified to include children's capabilities as a separate argument. However, doing so raises another question regarding the relationship between the two economies —one based on utility maximization, the other on profit maximization. What if the aspects of child «quality» from which parents derive the most satisfaction are not those that are rewarded in the market economy? The standard assumptions obscure the possibility of suboptimal outcomes.

Overlapping generations models provide an alternative theoretical space for exploring family and fertility dynamics, with greater scope for intergenerational transfers and conflicts. Oded Galor and David Weil (1996) eschew the dynamic utility approach and offer a growth model with endogenous fertility based on over-lapping generations. In their model, there are three generations —childhood in which children consume parent's time, working age in which couples work, raise children, and save and older age in which couples are finally able to enjoy consumption, perfectly financed through prior savings. Children enter a joint utility function directly, instead of assuming a degree of altruism towards future generations.

Here, too, the model forecloses the possibility of fertility decline past a certain lower bound. With below replacement fertility, population growth eventually turns negative, and the size of the labor force declines, with macroeconomic consequences that remain unexplored. If fertility goes to zero, the entire growth model collapses. In this case, the household's decision-making problem involves a trade-off between having children and saving income to finance consumption later in the life-cycle. There are no bargaining dynamics or distributive conflicts between generations.

Unlike Barro and Becker, Galor and Weil make some effort to incorporate distributive dynamics around gender into their model. Specifically, women's potential earnings in paid employment determine the cost of children. Women's earnings increase with capital accumulation, leading to a fall in fertility as female labor force participation expands. However, inequalities between women and men are not the outcome of uneven bargaining dynamics or group collective action. Instead, differences in productive endowments, specifically the physical strength of men, determine the gender pay gap.

It is important to recognize that the choice to have children generates no externalities in Galor and Weil, in the sense that consumption in the second generation is

entirely financed through prior savings and there are no transfers to the older generation. Children receive a transfer of time from their mothers, but the transfer of time is a fixed amount per child. The productive potential of children does not benefit the generation of couples who raise those children.

Kinship plays an important role in the utility functions of both Barro and Becker and Galor and Weil. In Barro and Becker, the unit of analysis is a sexless individual who produces offspring to create a dynasty of genetically related individuals. Altruism is evident only within these dynasties –there is no expression of altruism towards anyone who is not genetically related. In Galor and Weil, the unit of analysis is the heterosexual couple. The offspring of these couples are also heterosexual couples. These children enter the utility function –but no utility is derived from individuals or couples who are not genetically related (i.e. every child's spouse has the same parents). This raises questions about the scope and nature of altruism. Altruism may be strongest along kinship lines. Yet few couples (to say the least) are siblings. If parents care about grandchildren, they should also feel a degree of altruism towards the unrelated potential partners of their children —introducing introducing the possibilities of spillovers and externalities from familial altruism (Frances Woolley, 2000).[3]

Returns to an individual's human capital may rise with the overall stock of human capital or the social returns to investments in education may exceed the private returns (e.g. Becker, Murphy, and Tamura, 1990; Siew Ling Yew and Jie Zhang, 2009). In other words, externalities in the production of human capital, which is produced separately from physical human beings, are included. However, the possibility that private fertility choices may generate social benefits —i.e. that there is also a public goods dimension to family investments in children— is not.

An alternative to assuming altruistic preferences in these models of endogenous fertility is to assume that parents are selfishly motivated by the need to support consumption in old age. Investments in children provide a means of securing this support if children transfer income to their older parents who no longer work in paid employment (e.g. Olivier Morand, 1999). Perfect and costlessly enforceable social contracts insure that these transfers are forthcoming. In the absence of perfect contracts, the motivation of parents to have children weakens or disappears.

Gary Becker and Kevin Murphy explicitly consider the difficulty that some parents may have in enforcing any «payback» for investments in their children's capital. They argue that the state that payback, taxing the current working age population to finance expenditures on public education for the young, then taxing the future working age population to finance public pensions for the old (Becker and Murphy,

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[3] Woolley (2000) argues that John Rawls, in his theory of justice, assumes altruism within dynasties, very much along the lines of Barro and Becker (1988).

1988; Becker, 1988). These economists do not, however, consider any other contractual obligations within the family that might invite state intervention. For instance, the possibility that fathers might default on their responsibilities to children in the event of non-marriage, separation, or divorce is never considered.

Our assessment of neoclassical growth models that do not presume joint utility and that «problematize» intergenerational transfers is summarized in the third column of Figure 1. The first two rows are identical to those for the other category of growth models, for the same reasons. However, subsequent rows differ. A broader analysis of social institutions, cooperative conflict, and group bargaining, and imperfect contracts can be modeled on the treatment of intergenerational exchanges, which are explicitly acknowledged as non-market transfers. While these models seldom emphasize imperfect information or externalities, such problems are implied by the evolution of institutional forms such as public provision of education and pensions.

4. FUTURE DIRECTIONS

Most existing models of the relationship between the family and the economy seem to offer two extreme views: either they ignore family decision-making or they treat it in highly stylized terms as a process of maximizing a joint utility function. There is ample conceptual space between these two extremes for innovative modeling. One important example coming from the Keynesian tradition emphasizes factors influencing the supply of caring labor (Elissa Braunstein, Irene van Staveren, Daniele Tavani, 2011). Our approach, more focused on family decision-making, highlights an important opening created by neoclassical overlapping generation models.

While we hope to develop a more specific model in future work, we outline some of its features here:

In a neoclassical world, individuals are equally altruistic toward all family members and entirely self-interested in all their other dealings. In our world, individuals are altruistic toward family members, but the degree and direction of their altruistic preferences are variable. Further, individuals are altruistic toward non-family members, especially to those with whom they frequently interact, those who resemble them in important ways, and those who represent potential collaborators. This helps explain collective action based on class, race/ethnicity, and citizenship. Family decision-making provides a model for other forms of collective decision-making in which cooperative conflict also comes into play.

This model suggests that family decisions, such as those regarding family size, are likely to be affected by relative prices and incomes, as emphasized in neoclassical models. However, changes in the relative bargaining power of men and women, parents and children, and other social groups are induced by institutional and technical change. For instance, rights to paternal child support in the event of non-marria-

ge or marital dissolution, reproductive technologies that allow women independent capability to avert childrearing, and opportunities to engage in education and training significantly increase women's bargaining power in the household. Similarly, a legal right to subsidized public education significantly increases the bargaining power of young adults relative to their parents, as well as the bargaining power of young adults from low-income relative to high-income households.

Bargaining power in the polity shapes bargaining power in the household, and vice versa. Women without institutional influence are often left powerless at home; attainment of power at home, in turn, enhances opportunities to influence the polity. Age cohorts also have differential power: individuals under the age of 18 are powerless to vote, while those over the age of 65 wield significant electoral influence. Total spending on children also varies enormously across lines of class, race/ethnicity, and citizenship, with implications for the future quality, as well as size of the future labor force.

A variety of institutional factors influence the distribution of the net costs of children both in the family and in the larger economy. The distribution of net costs, in turn, affects both private and public decisions regarding investment. In modern capitalist economies such as the U.S., women bear a disproportionate share of the pecuniary costs of raising children, both in terms of time and money. The pecuniary benefits of children as taxpayers and workers, however, are largely captured by groups outside the family (as well as children themselves).

Neoclassical models of the labor market generally assume that workers earn the value of their marginal product, while non-neoclassical models emphasize, instead, the relative bargaining power of workers and capitalists. Note the parallel in approaches to the family. Neoclassical models with joint utility functions assume that the marginal utility of children equals their marginal cost; at least some of the overlapping generations models show why this is not necessarily the case. Taking this point further, our approach emphasizes ways in which the relative bargaining power of men and women, parents and children, parents and non-parents influences the distribution of the costs of children.

This approach has important policy implications. Consider findings that young children in the U.S. are disadvantaged by growing up in extremely poor families (Trina R. Shanks and Christine Robinson, 2013). In a neoclassical growth model, the resulting reduction in children's capabilities affects only family utility, with no direct effects on the macroeconomic growth path. If children are viewed as investment goods with public spillovers, however, this reduction in potential productivity could lower the payoff to public spending on education, increase social costs related to delinquency, crime, and unemployment, and reduce the supply of productive workers.

Why do families choose to raise children in poverty? If they have perfect information regarding their future income, credit constraints, and possible impacts on child outcomes one might conclude that they place little weight on their children's economic success. But in addition to imperfect information, at least three bargaining factors are relevant. Many single mothers and their children have incomes under the poverty line because the fathers of those children defaulted on commitments to help provide for them. Single mothers may have difficult time finding secure employment because public policies provide relatively little subsidized child care or paid family leave from work.

And when single mothers do find employment, the minimum wage may be too low to allow them to support their children at adequate levels. From a neoclassical perspective, a minimum wage interferes with labor market equilibrium, generating unemployment. By our reasoning, a minimum or living wage is also an important input into the support of the next generation of workers. If the market wage is too low, its negative effects on human capabilities could reduce economic growth in the long run, with effects larger that any reduction in employment in the short run.

In most neoclassical models fertility decisions at the household level have few macroeconomic consequences. Assumptions such as constant returns to scale, no externalities associated with fertility decisions, perfect information and a limited role for intergenerational transfers (e.g. old-age consumption entirely financed by rational savings earlier in life) mean that low fertility does not affect the growth path of the economy or social welfare. Constant returns to scale implies that variables can be expressed on a per capita basis, the economy can be «scaled up» or «scaled down» to match any population size without changing these ratios or the long-run growth path. The absence of externalities means that family decisions have no spillover effects on market production. We reject these assumptions in favor of an approach that allows population dynamics to have macroeconomic implications.

Children represent investment, consumption AND public goods. This is exactly why we need macroeconomic models that call attention to both the size and the distribution of spending on the next generation.

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