Fall 2000

Women's Work and Economic Development

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Recommended Citation

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W omen's labor force status relative to that of men is an important bench-
mark of their status in society. In developed economies, researchers seek
to measure women's well-being by examining factors influencing wom-
en's labor force participation, and by measuring and understanding the gender gap
in wages, to determine why women's wages are less on average than those of men,
even after controlling for education and labor market experience.[1] But in devel-
oping countries, earnings in the paid labor force outside the household are often
not a major source of family income. In Côte d'Ivoire, for example, data from the
1988 Living Standards Measurement Survey indicates that of the men and women
aged 12 or older who worked in the year prior to the survey, only 27.6 percent of
the men and 5.6 percent of the women did *any* work as employees. The remainder
were self-employed or worked as "free" labor in family enterprises.

In poor countries where women are primarily engaged in family enterprises,
issues such as gender gaps in wages and glass ceilings in promotion are largely
irrelevant. Instead, the major concerns are how resources are allocated to women
and girls within families; whether women engaged in self-employment face barriers
in access to credit and other factors of production; and whether women have rights
to inherit or purchase land or own other assets.

This essay discusses how the role of women in the labor force varies with the
level of economic development. Although there is diversity across countries at

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[1] Altonji and Blank (1999) provides an extensive and useful summary of this literature.

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similar income levels in how much women work and the types of jobs they perform, several clear patterns emerge from the data. The first section sketches a model of how women's labor supply and type of work are affected by the level of development. The second section presents evidence from cross-country data on these issues. The third section uses information from two developing countries, India and Thailand, to examine whether the relationships between work status and development that are observed in the cross-country data are consistent with patterns within countries. These two countries are quite different from each other, both in their recent growth experience and in their historical treatment of women, and make for an interesting and useful comparison. The fourth section discusses recent literature on resource allocation to women within households in poor countries.

Women's Work and Economic Development in Theory

Simple textbook models of women's labor supply specify that there are two key ingredients in a woman's labor supply decision. The first ingredient is the opportunity cost of her time, which with competitive labor markets will equal the prevailing wage for women with her education level, experience, and skill level. A higher wage has a substitution effect that makes working, and working longer hours, more attractive, but also has an offsetting income effect that depresses work hours. The second ingredient is income that is "unearned," or at least not earned by the woman. This includes the earnings of her husband if she is married, and other profits or transfer income of her family. (More complicated models account for the fact that husbands and wives may make joint labor supply decisions, so that the amount of income "unearned" by the woman is potentially endogenous.) Increases in women's unearned income exert only income effects on women's labor supply, resulting in reduced work hours and possibly withdrawal from the labor force.

In this model, how should economic development affect the labor force participation of women? Increases in income not earned by women—due for example to rising male productivity and earnings—will reduce women's labor force participation. However, if women's wages rise along with men's wages, or perhaps even faster, then increases in the wages of women may result in greater levels of female labor force participation, depending on the relative strength of income and substitution effects. Note that for women who are initially not in the labor force, increases in the female wage can exert only substitution effects, causing labor force participation to increase.

In thinking through the implications of this model, it becomes clear that the sequencing of how men's opportunities improve relative to women's plays an important role in how women's labor force participation changes with development. Improvements in men's opportunities without corresponding improvements in women's wages may reduce labor force participation. Subsequent rises in women's wages may draw them back into the labor force.

The textbook labor supply model assumes that labor markets are competitive. It is plausible that labor markets do not function competitively in developing countries, especially for women. In particular, there may be costs associated with women working outside of the domain of the family farm or nonfarm family enterprise. At one extreme, laws may restrict women from working outside the home; Afghanistan offers a current example. Custom or social norms may also limit the ability of women to accept paid employment, especially in manual jobs. Finally, off-farm jobs may be less compatible with child rearing, creating fixed costs of working off-farm. Farm household models, such as those presented in Singh, Squire and Strauss (1986), indicate that with no outside work opportunities or with sufficiently high fixed costs of working off-farm, women will supply work to the family farm/firm so as to equate the marginal disutility of labor with the marginal product *of on-farm labor*, rather than with the market wage. In this case, the type and amount of work that a woman does will be constrained by her family's production opportunities and characteristics. The amount of land and other productive assets her family owns and the numbers and skills of family members who are available to work on a family enterprise will affect her own labor supply decisions.

If women in low-income countries are largely confined to work in family enterprises, economic development that comes in the form of a new manufacturing sector may improve economic opportunities for men relative to women. This point is made by Goldin (1995), who argues that development will bring about initial declines in women's labor force participation. Men move into new blue-collar jobs that increase family income, exerting income effects that reduce women's participation. Furthermore, as men move out of agriculture and into paid employment, and the pace of urbanization increases, there may be fewer family farms or family enterprises in which women *can* work: opportunities for women could conceivably decline in absolute terms. Schultz (1988, p. 604) points out that "until women can acquire the requisite schooling and transferable skills to find suitable employment in firms in expanding sectors of the modern economy, the opportunity value of women's time relative to men's time may decline."

If industrialization initially results in the withdrawal of women from the labor force, what explains the striking increases in women's labor force participation in more developed economies? As economic development progresses, the nature of jobs available to women may change. Goldin (1995) presents evidence that the rise in female labor force participation that characterized the United States in the twentieth century was due to the growth of "white-collar" jobs, largely in the clerical sector, that were acceptable forms of employment for women. In addition, gains in female education, both in absolute terms and relative to male education level, made these white-collar jobs attainable for women and increased the incentives of women to work away from home.

Taken as a whole, this story indicates that there may be a U-shaped relationship between women's labor force participation and economic development. For very poor countries, female labor force participation is high, and women work mainly in farm or non-farm family enterprises. Development initially moves women out of the

labor force, partly because of the rise in men's market opportunities and partly because of social barriers against women entering the paid labor force. However, as countries continue to develop, women's education levels rise, and women move back into the labor force as paid employees holding mainly white-collar jobs. Although the U-shape is not a necessary outcome of the textbook labor supply model, it has been discussed and documented in a wide set of papers, including Sinha (1967), Durand (1975, p. 131), Psacharopoulos and Tzannatos (1989), Goldin (1995) and Horton (1996).

The idea that social norms prevent women from accepting blue-collar jobs plays a central role in discussions about declines in female labor force participation during industrialization. To the extent these norms exist, they appear to apply to wives but not to unmarried women. In many countries it is common for young unmarried women to work in factories, where they sometimes account for sizeable shares of production workers.

Why should social norms dictate that white-collar jobs are "acceptable" for married women, whereas blue-collar jobs are not? One explanation is that women dislike factory work, and avoid it if possible: norms may simply reflect women's preferences. Descriptions of the tedium of assembly line work done by young women in Taiwan (Kung, 1983) or of the long work hours and lax health standards in Mexican *maquiladoras* (Cravey, 1998) make marriage and escape from the labor force appear relatively attractive. However, factory work does confer some financial independence to women which they may not otherwise have had, and it is not clear why factory work should be more inherently distasteful to women than to men. Furthermore, in some countries it is not unusual for manufacturing firms to terminate women's jobs upon marriage, making it unlikely that women's tastes are the sole explanation.

Another explanation, put forth by Goldin (1995), is that societies stigmatize the husbands of women who do blue-collar work. In the view of the prevailing culture, "only a husband who is lazy, indolent and entirely negligent of his family would allow his wife to do such labor." Why would such a stigma exist? Goldin hypothesizes that this stigma reinforces a "powerful social norm that obliges men to provide for their families." A wife who takes a blue-collar job signals that her husband is shirking his obligations. The stigma does not attach itself to white-collar work, since the women in these jobs typically have more educated (and white-collar) husbands who are adequate providers.

A final explanation why married women avoid blue-collar jobs is that factory work does not pay wives enough to compensate for the fixed costs of working away from home. Until female education levels rise (increasing market wages) and fertility declines (reducing costs of working away from home), it does not make sense for wives to move into formal sector employment in large numbers. It may be impossible to disentangle what combination of tastes, norms, and costs are responsible for the dearth of married women in blue-collar jobs. Norms may reflect tastes, or vice versa. These norms may evolve endogenously, to reflect and possibly

reinforce the effects of budget constraints that make factory work undesirable for married women.

   The idea that women's economic opportunities do not keep pace with men's early in development has led some to argue that women become marginalized with development. The "female marginalization" thesis has its roots in Boserup's (1970) pathbreaking book on women and development, in which she describes how industrialization alters women's traditional social and productive roles. Scott (1986) summarizes indicators of female marginalization as declines in women's participation rates; women's exclusion from "capitalist" employment; the concentration of women into informal and tertiary sectors; and increasing inequality between men and women with development.[2]

   An idea implicit in the literature on female marginalization is that reductions in labor force participation and exclusion from formal sector jobs translate into lower levels of well-being for women. However, even if women are "marginalized" as workers, it does not necessarily follow that their levels of well-being will decline. Women typically live with men, and gains to men may therefore benefit women. The simple textbook model indicates that development unambiguously improves welfare, even when it results in fewer women in the labor force. In this view, increases in women's leisure that result from development are a *benefit* of development, and any "marginalization" is voluntary. However, this model assumes a "unitary household," with no distinction between the well-being of different family members. Non-unitary models of the household, in which individuals' market opportunities translate into bargaining power within households, can have quite different implications. For example, an increase in men's wages could in theory make women worse off, even as total household income increases. Assessing the effects of development on women's well-being requires attention to how resources are allocated within families. We will return to this issue in the last section of this essay.

Women's Work and Economic Development in Practice

   In this section, we use data from 90 countries from the 1970s and 1980s to trace out the relationships between economic development and several indicators of women's status: investment in education, labor force participation, participation in wage work, and fertility. The evidence we present indicates that women's education levels increase with development, both in absolute terms and relative to those of men. Women's labor force participation has the distinct "U-shape" discussed above, with participation rates high at very low and very high incomes. As income rises, women move from work in family enterprises to work as paid employees, and fertility drops.

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[2] Scott (1986) also critiques the thesis, both for being imprecise, and for being only partially consistent with experience in Peru and Brazil.

How do education levels of women vary across countries with different income levels, and over time given income? The curves in Figure 1 are based on data from 90 countries representing all income levels, with information on average years of education for 1970, 1975, 1980 and 1985.[3] For each year, average years of education for adult women (aged 25 and over) was regressed on the logarithm of a five-year average of real GDP per capita (in 1985 U.S. dollars). Nonparametric regressions are used to allow for flexibility in the relationship between education and income.[4] The top curves in Figure 1 show four estimated regression lines, one for each year. Women's education rises monotonically with income. An increase in per capita GDP from about $1000 U.S. (close to Benin in 1985) to $10,000 U.S. (close to Hong Kong in 1985) is associated with a rise in average education of about six years. Similar patterns are found for different measures of educational attainment (such as the fraction of women who have attained certain education levels) or for different age groups. The positive association between per capita GDP and women's education makes sense: education is both a (normal) consumer good, more of which is demanded at higher income levels, and a productive asset which results in higher income.

The top curves of Figure 1 also show that women's education levels have risen over time conditional on income, especially for lower and middle income countries; that is, the line for 1985 is at most points higher than the lines for earlier years. This secular rise in education levels, which appears for both men and women, is also documented in Schultz (1988), who cautions that the rapid expansion of educational systems in poorer countries may have been accompanied by reductions in the quality of schooling. Even so, these gains are large, especially when one considers that the average education level of *all* women can change only slowly: increases in the overall level of education occur only as older cohorts die off and are replaced by younger, more educated, cohorts.

The bottom curves of Figure 1 show the results of similar regressions for the female-male education gap, where the gap is measured as average years of adult female minus adult male schooling. The gap is largest (about 2 years) at a per capita GDP of about $1000 U.S., then shrinks as income rises. Since education

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[3] The data for per capita incomes are from the Penn World Tables Mark 5.6a (Summers and Heston, 1991). The income measures in this data set were converted to U.S. dollars using a purchasing power parity (PPP) index that often results in per capita incomes of poor countries that are higher than those that would be obtained using exchange rates. A useful way to compare the effects of the two methods is to look at Table 1 of the 1999/2000 *World Development Report*, which lists per capita GNP using both exchange rate and PPP conversions to U.S. dollars. The education data are described in Barro and Lee (1993). For a thoughtful critique of the comparability of cross-country aggregate data on education and labor force participation levels, see Behrman and Rosenzweig (1994).

[4] To avoid imposing a specific functional form on the data, we use Fan's (1992) nonparametric regression technique, which is similar in concept to a moving average. The technique is implemented by first selecting a set of points along the x-axis. For each these points, a weighted regression of the dependent variable on the log of real GDP per capita is estimated, where observations "close to" the point in question are given more weight, and the weights decline so that observations beyond a selected bandwidth receive zero weight. The regression results are used to predict the dependent variable at each of the points along the x-axis and these predicted values are then plotted on the graph.

Figure 1
Women's Education and Education Gaps
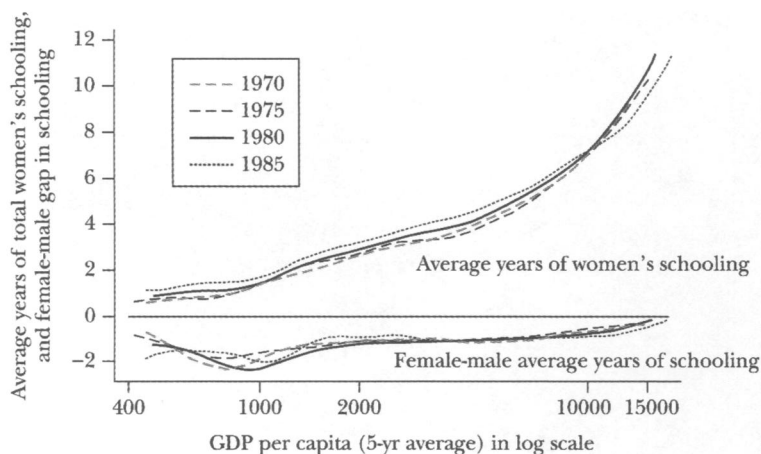
Note: The figure shows nonparametric estimates of years of education of women aged 25 years and older and the difference between men's and women's education against per capita GDP. The sample consists of data from 90 countries which have observations in each of 1970, 1975, 1980, and 1985. The variable on the x-axis is the log for each country of the mean over 5-year intervals of GDP per capita, taken from the Penn World Tables Mark 5.6a (Summers and Heston, 1991). GDP figures are the RGDPCH series, Real GDP per capita expressed in constant dollars (Chain Index), expressed in international prices, base year 1985. The y-axis shows nonparametric estimates of average total years of education in each country for women age 25 and over, from the Barro and Lee (1993) education data set. Barro and Lee use census and survey data for over 40 percent of their observations and the rest are estimated from school enrollment data. The variable on the y-axis in the bottom panel is average total years of education for women age 25 and over minus that of men age 25 and over, also from Barro and Lee.

levels for both men and women rise with income, the gap as a percentage of either male or female education narrows throughout the income range. There is no apparent decline in the size of the gap over time given income.

As women's education improves with development, what happens to labor force participation? Goldin (1995) presents evidence of a U-shaped pattern in female labor force participation using a single cross-section of data from 1985. In Figure 2, we replicate and extend these results using the cross-country data from 1970, 1975, 1980 and 1985. The top panel shows nonparametric regressions of labor force participation on the logarithm of five-year averaged per capita GDP. Following Goldin, labor force participation is measured for women aged 45-59, who are past the child rearing stage.[5] However, similar results would be obtained if

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[5] The Wistat data set uses labor force participation figures collected by the International Labour Organization. In turn, the ILO defines a person as economically active if she is working for pay or profit at any time during the specified reference period, whether she receives wages or not. However, definitions of labor force participation will differ somewhat from country to country, possibly affecting

Figure 2
Female Labor Force Participation
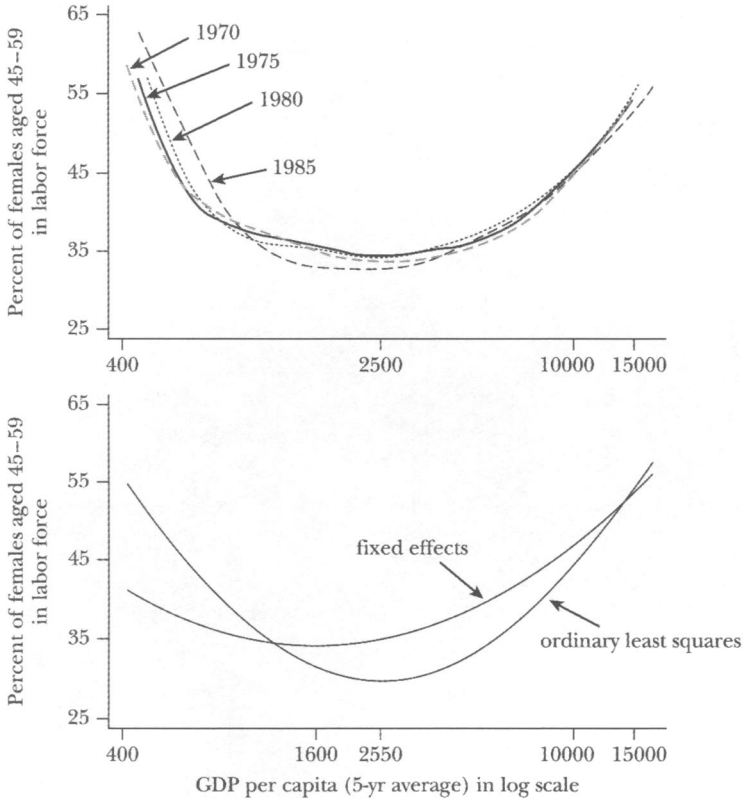
Note: See notes for Figure 2 for the sample size and GDP measure. The variable on the y-axis in both panels is the percentage of females aged 45–49 in the labor force; the data, originally collected by the International Labour Organization, are drawn from the Wistat data set (files 311abf*.wk1). The Wistat data set is compiled be the United Nations Statistical Division (UNSTAT) from data from international and national statistical offices; sources for all data are documented in the data files and in the users' guide. A woman is defined to be in the labor force ("economically active") if she is "working for pay or profit at any time during a specified reference period or seeking such work" (United Nations, 1997, p. 12). Note for some countries the age grouping is slightly different; see the Wistat files for details. Year effects are included in the ordinary least squares and country fixed-effects specifications.

younger women were included. There is a clear U-shaped pattern in the data in each of the four years presented. The poorest and richest countries have partici-pation rates in excess of 50 percent. The lowest participation rate, around 35 per-cent, is for those countries with incomes around $2500 per capita that earned

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the measurement of women's labor force participation (United Nations, 1997, p. 12). For a discussion of the difficulties of collecting high quality data on women's labor force participation, see Anker (1983).

"middle income" classifications by the World Bank in the mid-1980s. As Goldin notes, the countries that make up the downward-sloped part of the U tend to be African, followed by south Asian. South and central American economies generally lie near the bottom of the U, followed by south European, east Asian, and north European and north American countries going up the right-hand side. Schultz (1990) provides more detailed information on the type of work activities of women across different regions.

The evidence discussed above is based on comparing women's labor force participation in a set of countries observed at the same time period. However, because multiple years of data are available, we can also examine what happens to labor force participation for individual countries as they grow. We do this by estimating a quadratic regression, with labor force participation regressed on the logarithm of per capita GDP and its square, with and without a set of country-specific "fixed effects," or intercepts. The fixed effects allow the level, but not the shape, of the U to differ across countries. With fixed effects, the shape of the U is therefore identified from variation in income within countries over time, rather than by cross-country variation.[6]

The bottom panel of Figure 2 shows results from the two regressions on pooled data from 1970, 1975, 1980, and 1985. The graph for the ordinary least squares regression (which does not include country fixed effects) is very similar to the nonparametric relationships traced in the top panel, indicating that a quadratic captures the shape of the function well. On the same figure, we graph the implied relationship between labor force participation and income when country fixed effects are included.[7] The fixed effects estimates produce a more muted U-shape. The decline in women's labor force participation with income at low income levels is much smaller, and the "turning point" is earlier ($1600 per capita rather than $2550 per capita). The fixed effects results imply that if one were predicting changes in labor force participation within a single country, it might be wise to predict a more muted effect than is implied by the ordinary least squares or nonparametric results.[8]

Although women's participation in the labor force first declines and then increases with income levels, higher income is unambiguously associated with a higher fraction of women in the labor force who receive wages and a reduction in the total fertility rate. Figure 3 presents nonparametric regressions for 1970 and 1980. (Note the two different scales on the right and left y-axes.) The upward-sloping curves are from regressions of the fraction of working women who are wage employees on the five-year average of the log of per capita GDP. For the downward

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[6] To account for differences across years that are common to all countries, we also included a set of year dummies, although their inclusion makes little difference to the results.

[7] Because the level of the U differs across countries, we scale the vertical position of the function so that it lies at the average position of the curve across all countries.

[8] Attenuation bias due to measurement error in GDP could also account for the flatter curve in the fixed effects model.

Figure 3
Fraction of Women Workers Who Receive Wages and Fertility Rate
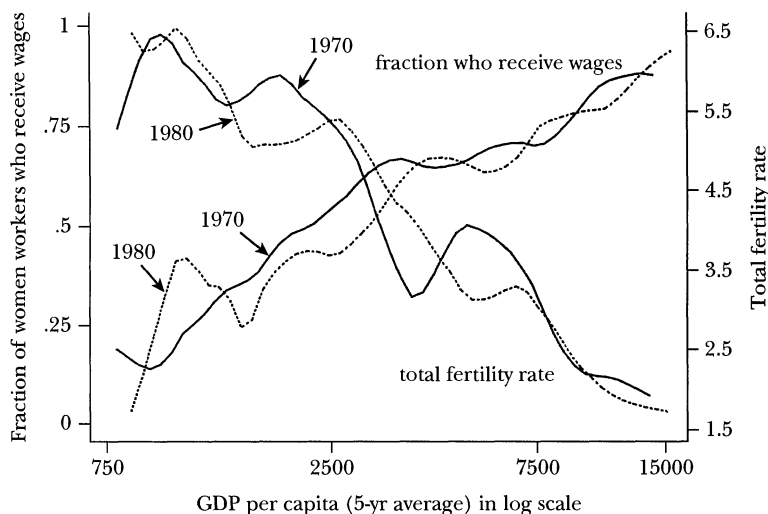
Note: The sample is of 53 of the countries from the sample in Figure 1 that have information on wage receipt and observations in 1970 and 1980. The measure of per capita GDP is the same as for Figure 1. The dependent variable for percent of women workers who receive wages (the upward sloping curve) is from Wistat file 35eacste, originally collected by the International Labour Organization; it is percentage of economically active women receiving wages, that is, the total number of female employees, over the sum of female employees, employers and own-account workers, unpaid family workers, and females economically active but not classifiable by employment status. Employees are defined as receiving renumeration in wages, salary, commission, tips, piece-rates, or pay in kind (U.N. 1997 p. 13). The total fertility rate is from Wistat file 43tfr, collected from various sources noted in the user's guide.

sloping curves, the dependent variable is the total fertility rate, defined as the number of children that would be born to a woman if she were to live to the end of her childbearing years and bear children at each age in accordance with prevailing age-specific fertility rates.

How does the dramatic decline in fertility with income fit with the theoretical framework discussed above? Provided children are normal goods, they are similar to leisure in the model: increasing women's wages—or increased access to wage work—increases demand for children via the income effect, but also reduces demand because the opportunity cost of women's time rises. If the second effect predominates, then increased wages or access to wage work may be responsible for the fertility decline. However, causality between reduced fertility and increases in wage work cannot be traced from our data. For example, it is possible that women who reduce their fertility for other reasons may invest more in education and command higher wages. A number of other factors may drive fertility declines. Reductions in child mortality that come with development may allow for lower fertility levels even if the "demand" for completed family size increases or stays the

same. Desired family size may also be affected by the extent to which children are expected to provide income for parents, especially in old age, so that the development of public or private pension systems may influence fertility. Although the causal relationships are difficult to sort out, it seems clear that increases in wage work and fertility declines are closely intertwined.

Two Examples: Thailand and India

This section supplements the cross-country evidence on women's work and economic development with evidence from Thailand and India. These countries were not chosen to be representative of the entire developing world; indeed, no two countries could be. However, Thailand and India are interesting to compare. First, their recent growth experiences are different. Before its recent economic crisis, Thailand had experienced several decades of rapid economic growth. Per capita GDP (in 1985 dollars) rose from $2178 in 1980 to $4891 in 1995, a 125 percent increase. India is poorer and, although it has also grown quickly, it has grown more slowly than Thailand. Per capita GDP was equal to $882 in 1980 and $1490 in 1995, a 69 percent increase (Easterly and Yu, 2000). Second, the status of women in Thailand and India is quite different. In Thailand, labor force participation rates for women have historically been high. In addition, it is not unusual for women to inherit, own and manage land. India, in contrast, is known for poorer treatment of women. Drèze and Sen (1995) document excess female child mortality rates in India. Mearns (1999) discusses regulations and social norms that prevent Indian women from retaining ownership and control of land.

A third key difference between Thailand and India, which will be important when assessing the results that follow, concerns the distribution of land. Land in Thailand has, at least until recently, been relatively plentiful, and ownership of land is fairly evenly distributed. Of the rural households in Thailand (in 1996) that list farming as their primary activity, 72 percent say they are primarily land owners, 11 percent say they are primarily land renters, and only 16 percent are primarily farm laborers. In contrast, India has a less equal distribution of land in rural areas, and a larger class of landless or nearly landless farm workers. Of the rural Indian households engaged in agricultural work, 36 percent classify themselves as "farm laborers." These differences in the distribution of land ownership affect the work activities and job characteristics of both men and women.

The Thai data we use come from the Socioeconomic Surveys (SES) from 1981, 1986, 1988, 1990, 1992, 1994 and 1996. The SES is a comprehensive household survey of between 12,000 and 25,000 households per year, with more households surveyed more recently. These cross-sectional surveys do not follow the same individuals over time. However, because the survey changes little across the years, we can track birth cohorts of women through the rounds of the survey, and examine how their labor force participation and work activities have changed across cohorts. The Indian data we use are from the 1993-94 National

Sample Survey (NSS). This is a nationally representative survey of 115,409 households, which collected information on work activities and household expenditures.

Within and Across Cohort Patterns

Because the Thai Socioeconomic Surveys allow us to track birth cohorts over time, we can examine how women's labor force participation and work activities have changed during a period of rapid economic growth.[9] We might expect that, if changes in factors that are fixed over time for individuals—such as educational attainment, or possibly rural/urban status—drive changes in participation and work activities, then cross-cohort changes will dominate within-cohort changes.

Indeed, Figure 4 shows that changes are largely accomplished across rather than within cohorts. The figure provides information on women's labor force participation and the fraction of working women who are wage workers. Each line represents the experience of a single cohort (defined by fixed five-year birth intervals) over time as the cohort ages, with "age" denoted as the midpoint of the age range for the cohort in any given survey year. The youngest cohort shown in this figure was born between 1968 and 1972, and the oldest cohort shown was born between 1918 and 1922.

In the graph for adult female labor force participation, the cohort lines are relatively flat until women reach their early 40s, and then decline steadily into old age. This is consistent with Horton's description of Thai female labor force participation following a "plateau" pattern, rather than the "double-peaked" patterns observed in Japan and Korea, with greater participation in pre- and post-childbearing ages (Horton, 1996). In addition, the figure provides some evidence that labor force participation is lower among younger cohorts, conditional on age. For example, the participation rate among those aged 34 to 38 years was 91.0 percent for those born between 1943 and 1947 (observed in 1981), 88.4 percent for those born between 1948 and 1952 (observed in 1986), and 86.9 percent for those born between 1958 and 1962 (observed in 1996). The decline in labor force participation (conditional on age) is consistent with the model discussed in the last section, and is possibly explained by income effects, with younger and richer women demanding more leisure. However, participation rates are noisy, with clear "macro" shocks that affect all cohorts. It is difficult to determine if younger cohorts will continue to have lower participation rates.

The bottom panel shows data on the fraction of women in the labor force who receive wages. The relatively flat cohort lines indicate that this fraction varies little over time within cohorts. The higher lines for younger cohorts show that the younger, more educated, cohorts are much more likely to work for wages than older cohorts. In graphs not presented, we find that younger cohorts are also more

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[9] We examine these effects only for Thailand because we do not have similar data over time for India, but given India's slower economic growth, the cohort effects we look at might not be as pronounced.

Figure 4
Thai Women Aged 22–65: Labor Force Participation and Receipt of Wages
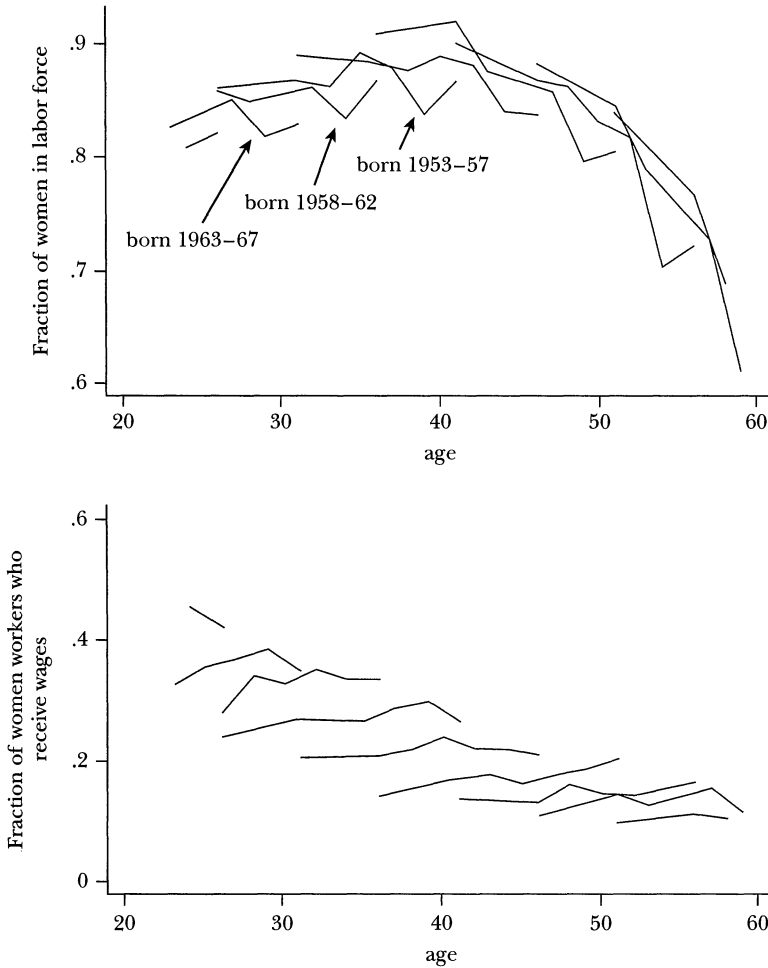
Note: Data are drawn from the 1982, 1986, 1988, 1990, 1992, and 1996 Thai Socioeconomic surveys.

likely to work in nonfarm jobs that pay wages. Although women have moved from farming into both manual and nonmanual wage work, the rise across cohorts in nonmanual employment is much steeper than the rise in manual employment. This pattern is reversed for men: although younger cohorts of men are also more likely to work for wages and in nonagricultural jobs, they have moved more heavily into manual than nonmanual wage work. Information in Phananiramai (1996) indicates that by 1989, sales jobs were the most common form of "white-collar" employment for women. Those in "blue-collar" nonfarm jobs worked predominately as craft and production workers, often in firms manufacturing food products, textiles and footwear.

Education, Labor Force Participation and Wage Work

The first section of this essay argued that greater education among men would reduce women's labor force participation, whereas increases in female education would draw women into the labor force, and into white-collar wage-paying jobs. In what follows, we examine how women's education and the education of their spouses affects work activities in Thailand and India. In both countries, there may be large differences in women's opportunities in rural and urban areas, so we estimate results for rural and urban women separately.[10]

The top two panels in Figure 5 display the results of nonparametric regressions of indicators of education levels on the logarithm of per capita household expenditure converted to 1992 U.S. dollars.[11] The education measure we use equals 1 if a "high" level of education was attained. For Thailand, "high" education is defined as having attended at least secondary school. The Indian survey uses slightly different education categories, and "high" education is defined as having completed middle school or more. This difference in definitions makes it difficult to compare levels of education across the two countries.

The regression lines indicate that, in both India and Thailand respectively, educational attainment is lower for women than men at all expenditure levels. In both urban and rural settings, in both Thailand and India, education for both men and women aged 22 to 65 rises steadily with per capita household expenditure. In both countries, the male-female gap in education rises with expenditure in rural areas, but remains steady with expenditure in urban areas. It should be noted that gaps in education among those aged 22 to 65 reflect education investments made between 10 and over 50 years before the survey. Current enrollment rates for boys and girls could be quite different. Furthermore, these graphs do not provide information on the causal relationship between expenditure and education: higher education can be expected to increase earnings and expenditure; richer households may demand more education.

The bottom left panel of Figure 5 graphs women's labor force participation as a function of household per capita expenditure, again using a nonparametric regression. Female labor force participation is lower for urban women in both countries, which is consistent with the idea that there are fewer work opportunities for women in urban areas. In addition, in urban settings, female labor force participation follows the U-shaped pattern observed in the cross-country data and graphed in Figure 2. In the poorest households, women are most likely to participate. Participation drops as expenditure initially rises, despite the fact that women in higher expenditure households have higher education levels. Only in urban areas and at the highest expenditure levels does women's participation in the labor force increase.

Although these general patterns are common across India and Thailand, the

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[10] The Thai data use three categories: rural, urban, and "sanitary districts," the latter being semi-urban areas. In the results that follow, sanitary districts are combined with urban districts.

[11] We use expenditure rather than income data because the Indian NSS collects only expenditure data.

Figure 5

Education, Labor Force Participation, and Wage Work in India and Thailand
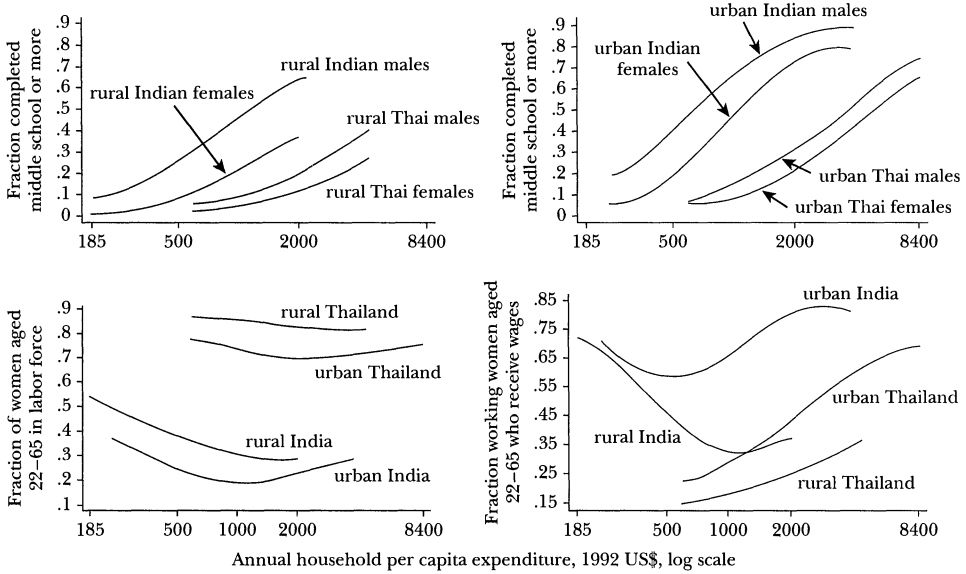
Note: For India, the data are from the household level National Sample Survey Organization Socio-Economic Survey, Fiftieth Round, July, 1993–June, 1994. The variable on the x-axis is the log of yearly household per capita expenditure, deflated to 1992 rupees and then converted to 1992 U.S. dollars using the 1992 purchasing-power parity converter from the Penn World Tables. For Thailand, the data are from the 1996 Socioeconomic Survey. The variable on the y-axis is the log of yearly household per capita expenditure, converted to 1992 U.S. dollars.

levels of female labor force participation are quite different. Thai female labor force participation rates do not drop below 60 percent at any household expenditure level, and Indian participation rates never exceed 60 percent. Furthermore, the U-shape is more pronounced in India.

Thailand and India differ as well in the probability that women work for wages, conditional on being in the labor force. The Thai data shown in the bottom right panel of Figure 5 are consistent with cross-country patterns: the two upward-sloping curves on the right (urban and rural) indicate that women at low living standards are unlikely to work as employees, and are instead concentrated in self employment or (as is more often the case) in "free family labor." The probability of working as an employee increases steadily with living standards. These patterns are quite different in India, represented by the two curves on the left (urban and rural). More than 60 percent of both rural and urban working women at the lowest levels of expenditure work for wages. This fraction initially declines with expenditure, and only increases at higher expenditure levels for urban women. The key to understanding these differences is the fact that, in India, there is a relatively large class of landless or near-landless poor households, the members of which often

work as casual labor on larger farms. Work as "free family labor" is not an option for many women from the poorest families. Acharya (1996) presents similar evidence from India, and suggests that (relative) affluence allows women to avoid working as casual workers, which is difficult and "low status" work.

The patterns of labor force participation and wage work shown in Figure 5 are consistent with the cross-country patterns presented above. However, they do not provide information on the causal relationships—between women's wages, unearned income, and work—that come out of the model discussed in the first section. In what follows, we analyze how women's participation decisions and the type of work performed are influenced by the education of women (which serves as a measure of opportunity cost) and their husband's education (which serves as a measure of unearned income.)

Table 1 presents regressions of indicators of married women's labor force participation on measures of their own education and the education of their spouses. Perhaps what is most striking about these results is the similarity of the estimates across the two quite different countries. In India, women with secondary schooling are only slightly more likely to be in the labor force than women with less than secondary schooling. In Thailand, secondary schooling has no effect on participation. In both countries, postsecondary schooling has large effects on the probability that a woman is in the labor force: women with postsecondary schooling are 23 percent (India) or 25 percent (Thailand) more likely to be in the labor force than women with less than secondary schooling. At the same time, higher spousal education is negatively associated with women's labor force participation. Several other factors play an important role in participation. Rural women in both countries are more likely to be in the labor force. Being a member of a scheduled caste or tribe (in India) is also associated with greater participation.[12]

Education also has large effects on whether working women are employees, and whether they work in "white-collar" nonmanual jobs. In both countries, more educated women are more likely to work as employees (rather than as self-employed or "free" family labor), and are more likely to work in nonmanual jobs rather than in agricultural or production jobs. The education of spouses matters as well, although in different ways for India and Thailand. In India, higher spousal education is negatively associated with work as an employee, whereas the opposite is true in Thailand. This is consistent with the view that there is more social stigma attached to women working outside the home in India than in Thailand, especially in manual jobs. The fact that higher spousal education is positively related to work in "white-collar" jobs in both countries suggests that stigma is not attached to all types of jobs.

These results are consistent with the patterns of labor force participation and

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[12] The term "scheduled caste"was first used in 1935 by the British, when the lowest-ranking Hindu castes were listed in a "schedule"attached to the Government of India Act (Dushkin, 1972, p. 166). These castes and the scheduled tribes are historically, socially and economically disadvantaged.

Table 1

Women's Labor Force Participation and Types of Employment

(married women aged 22–65; linear probability models)

	Labor Force Participation	Employee	Nonfarm Nonmanual Worker
	Indian Women (obs = 84,573)	Working Indian Women (obs = 23,856)	
Completed secondary schooling	0.051	0.369	0.533
Completed postsecondary schooling	0.254	0.512	0.587
Spouse completed secondary schooling	−0.150	−0.188	0.047
Spouse completed postsecondary schooling	−0.186	−0.126	0.086
Rural	0.163	−0.070	−0.285
In scheduled caste or tribe	0.110	0.218	−0.014
	Thai Women (obs = 68,432)	Working Thai Women (obs = 52,425)	
Has secondary schooling	−0.004	0.145	0.226
Has postsecondary schooling	0.231	0.530	0.451
Spouse has secondary schooling	−0.114	0.027	0.170
Spouse has postsecondary schooling	−0.181	0.055	0.210
Rural	0.202	−0.164	−0.333

Notes: All coefficients shown were significant at the 5 percent level or better (typically much better) with the exception of "has secondary schooling" for labor force participation of Thai women. For both countries, the regressions also included age, age squared, spouse's age and spouse's age squared. The Indian data are from 1993-94. The Thai sample pools data from 1981, 1986, 1988, 1990, 1992, 1994 and 1996. The Thai regressions also include a set of year dummies. "Labor force participation" equals 1 if a woman works as an employee, is self-employed or a free-family worker, or is unemployed, and equals 0 otherwise. "Employee" equals 1 if a woman's primary job is as an employee, and 0 if her primary job is as free-family labor or if she is self-employed. "Nonfarm nonmanual worker" equals 1 if a woman's primary occupation is in professional, clerical, sales or service occupations, and 0 if her primary occupation is listed as production worker, transport equipment operative, nonfarm laborer, or other agricultural worker.

wage work found in the cross-country data. In both countries, increases in educational attainment of both males and females are predicted to result initially in lower levels of female participation. For example, moving both a woman and her spouse from having less than secondary schooling to having completed secondary schooling would reduce the probability that she participates in the labor force by 10 percent in India and 11 percent in Thailand. Shifting population from rural to urban areas would further reduce participation. At the same time, the probability that a working woman is an employee, or is in a "white-collar" job, increases if she and her spouse both have secondary education. Further increases in educational attainment above the secondary level lead to increases in labor force participation. For couples in which both spouses have postsecondary schooling, women are slightly more likely to participate in the labor force than are women from "low

education" households. However, only a relatively small percent of women in either country have achieved postsecondary schooling.

Gender Discrimination and Resource Allocation in Poor Countries

The literature on "gender gaps" in developed countries has focused on differences between men's and women's wages. However, obtaining measures of gender differences in returns to work—whether driven by discrimination or by other factors—is complicated in poor countries. When men and women work together in family enterprises, neither individual-level productivity nor the distribution of profits across the family members who work in the enterprise are directly observed. It is also difficult to determine the sources of gender differences in wages among those who do work for wages. The fact that women (and men) selectively enter both the labor force and wage employment means that the estimation of differences in the returns to education across men and women can be misleading (Schultz, 1990). In rare instances, gender differences in productivity can be directly observed and analyzed, as when men and women perform "piece-rate" work on the same tasks. An example is Foster and Rosenzweig (1995, 1996), who use piece-rate and hourly wage data to argue that agricultural employers practice "statistical" but not preference-based gender discrimination. However, piece-rate work is rare enough so that it cannot be used to draw general conclusions about discrimination.

Despite these difficulties, a large number of studies have attempted to analyze and decompose gender differences in wages and earnings in developing countries; for example, a set of studies for Latin American countries is in Psacharopoulos and Tzannatos (1992) and a set for Asian countries in Horton (1996). These studies present "Oaxaca decompositions" that break down gender differences in wages or earnings into a component due to differences in observed characteristics of workers (typically age, education, and labor market experience), and a component due to differences across genders in the returns to observed characteristics.[13] These studies generally find substantial raw differences in the earnings of men and women, which is not surprising given gender gaps in education and labor market experience. There are also sizeable differences across countries and time periods in the fraction of earnings or wage differences that can be explained by differences in observed characteristics. For example, the estimates in Horton (1996) indicate that 56 percent of gender wage differences can be explained by differences in observed

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[13] The percentage of the wage gap due to differences in returns to characteristics may not be a good measure of discrimination in labor markets. Mismeasurement of observed worker characteristics—for example, if women have lower quality schooling or less labor market experience—can result in differences in measured returns that are not the product of discrimination. Also, gender differences in observable worker characteristics may be the product of "pre-market" discrimination; for example, parents may invest relatively less in girls' education if women earn relatively less as adults. Labor market discrimination that reduces the returns to investment in girls may produce differences in worker characteristics.

characteristics in Japan in 1988. However, *negative* 37 percent of gender wage differences can be explained by differences in the observed characteristics of urban workers in the Philippines in 1978; that is, adjusting for differences makes the wage gap look worse rather than better. This diversity is largely the product of wide cross-country differences in the educational attainment of women relative to men. In the Philippines, women had higher average education levels than men, but their earnings were on average only 75.4 percent of men's in 1978.

Where a large fraction of women do not work for wages, it is useful to look beyond labor force statistics to examine gender differences in a broader set of indicators of well-being and access to resources. We have already presented evidence that girls in poor countries receive less education on average than boys, and that gaps in education decline as living standards rise (see also King and Hill, 1993). Another important measure of women's status is mortality. Figure 6 shows evidence from the cross-country data that women's life expectancy patterns are very similar to those for women's education: life expectancies rise with income and have improved over time given per capita GDP. A parallel analysis finds that female life expectancy improves relative to male life expectancy as incomes rise; female life expectancy is about three years longer than male life expectancy in the poorest countries, and the gap rises steadily to about six years for well-to-do countries. Another way to measure mortality differences is through "gender ratios"—the number of women divided by the number of men in a population—which show that women tend to outnumber men in Europe and North America, while the ratio of women to men is 0.96 in North Africa, and 0.94 in China, Bangladesh, and West Asia, implying excess female mortality (Drèze and Sen, 1995, p. 141).

It is important to note that although female life expectancy increases with development, these general patterns may mask the fact that the benefits of development are not distributed equally. For instance, Murthi, Guio and Drèze (1995) used district-level Indian data and found that indicators for levels of development had insignificant or even negative effects on gender ratios, whereas variables directly related to women, such as female labor force participation rates and female literacy rates, had positive effects on gender ratios. Such evidence supports Boserup's theme that economies may grow without making women—especially poor rural women—better off.

Investigating discrepancies between household welfare and the well-being of individual members is a major theme of the literature on "collective" household models. In the earliest "unitary" household models, in which it is assumed that households maximize a single utility function given a common household budget constraint, the distribution of resources within a family has no effect on how allocation decisions are made (Becker, 1965). However, more recent literature considers models in which members' individual preferences and control over resources influence the sharing rule within the household, so that women's gaining greater command over resources may give them greater bargaining power within

Figure 6
Female Life Expectancy and Per Capita GDP
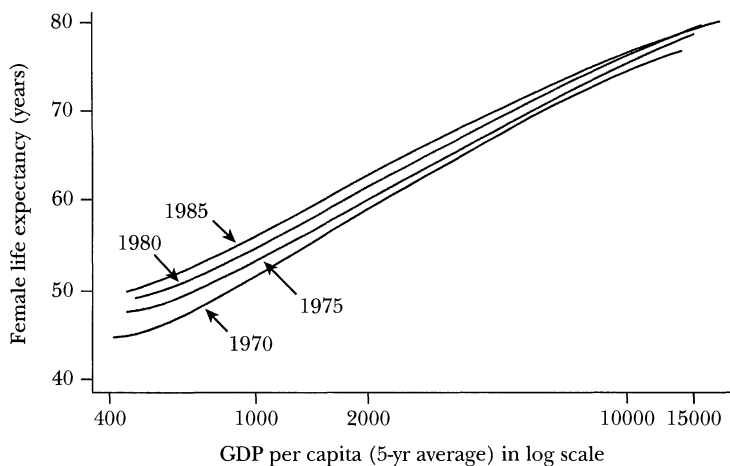
Note: See notes for Figure 1 for the sample size and GDP measure. Life expectancy for women is from file 61lifexp.wk1 of the Wistat data, originally collected by various U.N. sources.

the household.[14] These models of household behavior may be particularly salient in developing countries, where anthropologists have found that many households do *not* pool members' incomes; where husbands and wives may traditionally receive different income flows and be responsible for distinct household expenses; and where some women do not even know their husbands' incomes (Dwyer and Bruce, 1988; Schultz, 1999; Udry, 1996; Jones, 1986.) Collective household models imply that increased command over resources for women, in the form of stronger rights to own and inherit land, legal structures that make it easier or less costly for women to divorce, or improved labor force prospects (more labor market opportunities, higher wages, or greater labor productivity) may increase women's well-being both through direct effects and also by strengthening their bargaining position within households. Improved control over fertility through more reliable or less intrusive birth control methods, for example, may also improve women's bargaining power.

Empirical research on collective models has provided ample evidence that women and girls in developing countries often receive fewer resources within households. However, in many situations, *both* unitary and collective models can imply that allocations will be "biased" against women and girls. Suppose, for example, that less is invested in the health of women than men in places where women have fewer productive opportunities. There is sketchy evidence in support of this idea. For example, Rosenzweig and Schultz (1982) found that higher predicted employment rates for women in India were related to lower male-female

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[14] For reviews of this literature, see Behrman (1997), Strauss and Thomas (1995), and Schultz (1999).

survival differentials. In Africa, where more women participate in the labor force than in south and west Asia, survival rates for females appear to often exceed those for males (Schultz, 1999; Svedberg, 1990). This evidence is consistent with a collective model in which lower productive opportunities translate into less bargaining power for women. It is also consistent with a unitary framework, which predicts that there should be less investment in women's health relative to men's if the returns to investment are lower. Evidence that women's earnings are spent differently than men's—for example, papers which argue that families in which women control more resources invest more in children—are open to similarly mixed interpretations (Hoddinott and Haddad, 1995; Thomas, 1997). Determining whether unitary or collective models better explain observed patterns of resource allocation is an active and important area of research.

Whether collective or unitary models are correct, it is clear that many women in poor countries have weak command over productive resources. Few farming women in developing countries have title and control of land in their own names. In many areas of sub-Saharan Africa, widows lack even basic rights to inherit marital property (Potash, 1986). In south Asia, women have gained greater legal inheritance rights over time, but inequitable restrictions continue to keep women at a disadvantage, and women's property rights in practice are much less than in the legal code (Agarwal, 1994).

Women may also have less access than men to inputs of farming and other productive assets such as labor-saving technologies, credit, and extension services. Udry (1996) makes the case that in Burkina Faso, labor and fertilizer are allocated inefficiently between men's and women's land plots within households. Men use more inputs, even though total household output would be greater if inputs were reallocated toward their wives. Dey Abbas (1997) notes that African women farmers may find it difficult to adopt productivity-enhancing technologies because they have land rights only through men; they have obligations to provide labor in male-controlled fields, which sometimes take precedence over working their own fields; and they may have relatively little freedom to reinvest their income in labor-saving equipment or other technology. Country studies in sub-Saharan Africa show that the percentage of women obtaining credit from formal financial institutions is less than half that of men: women are less mobile than men, so banks are harder to reach; more women than men are illiterate, making documentation difficult; and women lack collateral, particularly land titles (Saito, 1994). Furthermore, extension services may be targeted more toward male cash crops or be unavailable to women because agents are men and communication between women and men is culturally frowned upon.

Differences in men's and women's well-being and achievements as adults may be rooted in differences in investments they receive as boys and girls. A large body of literature examines whether girls are allocated fewer resources than boys within households. A useful summary is in Deaton (1997, ch. 4). There is evidence that for some areas in India where the gender ratio is low, allocations of food and health care favor boys; similar patterns have been found in Bangladesh and Nepal

(Schultz, 1999). Other work in India indicates that females eat less when food is scarce and that parents favor sons during the lean season (Behrman and Deolalikar, 1990; Behrman, 1988). Deaton's research on boy-girl discrimination, which examines whether adults sacrifice more of their own consumption for boys rather than girls, yields more mixed results. He finds no evidence of bias against girls in Thailand, Pakistan, and Côte d'Ivoire, and only limited support for bias against girls in India. To the extent that there is discrimination against girls, this method either does not detect it, or discrimination works though some other mechanism.

One reason why girls might fare badly within households is that in poor credit-constrained families, siblings must compete for resources and boys have the advantage, possibly because investments in boys yield higher future returns to parents than do investments in girls. Garg and Morduch (1998) find in Ghana that if children had all sisters and no brothers, they would do 25–40 percent better on measured health indicators than if they had all brothers and no sisters. Parish and Willis (1993) find that Taiwanese children with older sisters tend to get more education than those with older brothers, suggesting that older sisters receive fewer resources than older brothers. More research is needed to examine how gender differences in intrahousehold allocation change over time as countries develop.

Conclusion

How does women's work status change with economic development? Several clear patterns emerge in the data. Although there is a great deal of variation across countries and across areas within countries, both cross-country and individual-level data indicate that women's participation in the labor force first declines and then rises with development; women move from work in family enterprises to work as employees as incomes rise; fertility declines with income; and gender gaps in education narrow with development. Women's education levels, and the education levels of their spouses, appear to be important determinants of women's labor market activities.

Because women's work status in developing countries is so different from that of women in richer countries, we examined other measures of welfare to assess women's status in society. There is strong evidence that females fare poorly relative to males in many developing countries: girls receive less education, female mortality is higher than male mortality in many countries, and women often have only tenuous control over land and other productive assets. Thus, it is perhaps no surprise that broad welfare indicators, such as mortality rates and education levels, indicate that women's well-being improves on average with development, both in absolute terms and relative to men.

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