

PA-A.BH-728

ISA 71097

**Summary Paper for**

**Investing in Female Education for Development:**

**Women in Development Strategy for the 1990's in Asia and the Near East\***

May 9, 1991

by

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\*This is a summary of the more extensive survey with the same title that is presented in Behrman (1991).

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## EXECUTIVE SUMMARY

There is a persistent gap between female and male education in most of the Asia and Near East regions, though the gap has varied enormously among countries. Differences in school enrollment rates have lessened over the past two decades throughout the regions, and may have been eliminated in Sri Lanka and in some East Asian countries. Nevertheless, these differences remain considerable in many countries.

Enrollment rates refer only to levels of investment in formal schooling. Evidence of gender gaps in other forms of educational investment (e.g. informal, vocational) is very sketchy, but seems to suggest similar patterns. And although the gaps between investments in female and male education probably have been declining in the Asia and Near East regions in recent decades, gender gaps in the stock of educated adults are likely to remain for decades in most countries in the regions.

Modeling the determinants of and the impact of female education leads to some important insights. A major basic point is that one has to be careful about not misinterpreting associations between female schooling and various outcomes in areas such as wage rates and child health necessarily to imply causality. It is important to consider the fact that females who have more education are not selected randomly. These women and girls are likely to come from family or social backgrounds that are more supportive of female education and to have greater intellectual ability or motivation. Therefore, if one wishes to identify the effect of increases in female schooling on various outcomes, all of these other characteristics -- some of which are difficult to measure -- must be controlled.

As a result, interpretations of many of the existing empirical studies of female education in the Asia and Near East regions and elsewhere in the developing world are ambiguous. But there are recent studies which attempt to control better for such empirical problems. These studies suggest that demand factors are important to understanding gender gaps in education. Demand factors include expected rates of return in labor markets and the opportunity costs of gender specialized tasks such as child care.

It should be noted, however, that the gender gap in wage rates does not necessarily imply a gender gap in rates of return to educational investments. If the wage gap narrows with more schooling, for example, the rates of return on investments in schooling may be higher for females than for males. Such a pattern is found for post-primary schooling in recent estimates for Southeast Asia.

Also, in addition to demand factors, supply is important in some contexts. One study on Pakistan, for example, reports that elimination of the gender gap in primary schools would eliminate from half to all of the gender gap in cognitive achievement.

Although recent systematic studies suggest that the impact of female schooling on paid labor force participation and other outcomes is substantially less than often claimed, the effects of female schooling appear to be far-reaching and important. These recent studies also examine certain effects that are not usually included in most studies of female schooling. An example is that women's and men's schooling may be substitutes in household production, though there still seem to be important gender links across generations.

This paper considers policy implications of female education. One major motivation for policy implications is the possibility of reducing market distortions, thereby allocating

resources more efficiently so that the benefits are greater. Market distortions imply differences in private and social costs and benefits of education. For example, if greater numbers of well educated women reduce the spread of contagious diseases, then private incentives to invest in female education are likely to be inadequate from a social point of view since private incentives are unlikely to incorporate the benefit to others of a reduction in contagious diseases.

Although it is often claimed that there are major efficiency reasons for investing in female education because of such externalities, there is very little evidence on the existence or importance of such externalities and their relationship to female education. Efficiency justifications for policy interventions that favor female education seem to be based primarily on speculation. Nevertheless, there does not appear to be an efficiency justification for the present gender gap in schooling. Therefore, lessening this gender gap probably would increase efficiency.

A second major motivation for policy interventions in education is the issue of equity which argues strongly for the elimination of gender gaps in education.

The survey elaborates somewhat on more detailed policies related to the supply of and demand for female education and on research needs.

## **1. INTRODUCTION**

This paper is a summary of a longer survey of the current state of knowledge regarding female education and development, with particular emphasis on countries in the Asia and Near East regions. The main objective of this paper is to provide background for Women in Development (WID) and educational strategies in the 1990's in these regions. The survey examines what we know and do not know about female education and discusses implications for immediate policy formulation and the research that will provide a strong foundation for future policy formulation.

### **1.1 Importance of Education in Pursuit of Goals Related to Productivity, Equity, and Socioeconomic Outcomes**

The developing countries have major economic goals related to economic growth and to equity.<sup>1</sup> The pursuit of these goals relates to (1) increasing the efficient use of productive assets, (2) changing the distribution of assets among members of society, or (3) ensuring that all members of society have some basic level of access to and control over

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<sup>1</sup>Growth and equity usually refer to income or to command over resources. Sometimes other terminology is used for these goals. A prominent example is Sen's (1985) focus on "functionings" and "capabilities," which have become fashionable in some circles as preferred means of characterizing a broader interest in human welfare in which the role of income as a means rather than an end is emphasized. but as Ravallion (1990) emphasizes in a recent interview of Dreze and Sen (1989), in the operationalization of the Sen approach, despite the distinctive terminology, income or the command over resources from a combination of one's income and one's access to social services, remains central in the operationalization of Sen's concepts.

resources and assets (though private or public entitlements to transfers can serve this purpose also). Typically, major assets are characterized to include **physical capital** (such as machinery and equipment), **natural resources**, and **human resources**. Analysts' and policymakers' perceptions of the relative importance of these assets to the pursuit of growth and distributional goals have varied from time to time. At times, one of the three has been emphasized to the exclusion of the others. But from a longer-term perspective, all three appear to be important, with the question of emphasis at any point in time being in part the question of which of the three is in relative short supply in a particular context.

Human resources usually refer to education, health, nutrition and through their impact on the size of the population, fertility and mortality. Though there are important dimensions of each of these and of the interactions among them, probably most emphasized among them has been education. In recent years, education has been emphasized considerably. There are assertions that the rates of return to investments in education, particularly basic schooling, are quite high in comparison to other investments. (See Colclough 1982, Eiscmon 1988, Haddad, Carnoy, Rinaldi, and Regal 1990, King 1990, King and Hill 1991, Psacharopoulos 1985, 1988, World Bank 1980, 1981, 1990.) This perspective has been reinforced by the so-called "new neoclassical growth theory" of Romer (1986), Lucas (1988), Azariadis and Drazen (1990) and others that places externalities in the stock of knowledge at the center of analytical growth models. These models are consistent with phenomena such as diverging growth rates among countries and with increasing growth over time. For such reasons investments in education are advocated as a major means of

pursuing growth and equity goals.<sup>2</sup>

Education can take many forms, including formal schooling, vocational training programs, informal household education, and on-the-job training. Of these, formal schooling has been emphasized most for various reasons. Formal schooling is most amenable to policy so it is of particular interest to governments and to international institutions. Formal schooling is perceived as the cornerstone of all education because, at least in its basic forms, it lays the foundation for subsequent formal and informal education and training programs. Furthermore, information about formal schooling is more accessible than information about other forms of education because government involvement in it is considerable and because it is a relatively separate activity (in contrast to informal education).<sup>3</sup>

Whatever the relative importance of these reasons, there is more knowledge about the role of formal schooling than about other forms of education in development. This may highlight a need for further analysis of other forms of education.<sup>4</sup> It certainly limits the range of topics that can be covered in this survey to those related to formal schooling.

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<sup>2</sup>I present surveys of the empirical evidence and of the analytical models in Behrman (1990a,b). Also see Section 7.1.2 in Behrman (1991).

<sup>3</sup> It is important to note also, however, that educational analyses are generally conducted by analysts with extensive education who may value formal schooling more than does society as a whole. It is also likely that such analysts understand and communicate about formal schooling better than they communicate about other educational investments. These considerations may lead to overemphasis on formal schooling relative to alternative forms of education.

<sup>4</sup>Though just because we know less about other forms of education does not necessarily mean that the returns to research resources are likely to be higher to investigating such forms of education rather than formal schooling. In making such a decision, one also has to take into account such factors as the greater difficulties in obtaining useful information to undertake such research.

## 1.2 Particular Roles of Female Education

Investments in female education are of particular interest and importance to development for three primary reasons.<sup>5</sup>

First, available estimates suggest that the rates of return on investments in female schooling (in terms of economic productivity) tend to be at least as high as the rates on investments in male schooling (Schultz 1989, 1991).

Secondly, it is widely conjectured that there are important positive effects of women's education on non-market factors related to human resource development (i.e. health, nutrition, and children's education) and population growth (i.e. reductions in fertility and infant and child mortality). (See World Bank 1981, Colclough 1982, Eisemon 1988, Haddad, Carnoy, Rinaldi and Regal 1990, King 1990, King and Hill 1991.) There is a widespread perception that better educated women are better able to process information and to use goods and services effectively. Women are then better prepared to provide health care, to educate their children and to reduce their fertility to desired levels.

Within the framework of the widely-used quantity-quality model of fertility (e.g. Becker and Lewis 1973, Willis 1973), better educated women have incentives to have fewer children, but children with a greater number of economic and social advantages. Women with fewer children have a comparative advantage in being able to provide those children with a higher standard of living. And if there are negative externalities to population growth

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<sup>5</sup>U.S. Agency for International Development (1990) emphasizes that female education is a topic of major concern for reasons similar to those described here.

as is often claimed<sup>6</sup>, then social benefits will accrue in addition to the private benefits of focusing on child quality instead of child quantity.

If the effects of education are evaluated in terms that are broader than just economic productivity, then returns to investments in female education are likely to exceed the returns to investments in male education because of these effects on health, nutrition, child development, and fertility that are additional to the narrow economic productivity effects.

It is important to note that the possibilities outlined in the previous three paragraphs depend in substantial part on gender specialization in the provision of health, nutrition and child care. Were there changes in such gender specializations in the household, there also would be changes in the gender differences in returns to education related to these nonmarket activities.

Thirdly, there is the issue of equity. In most societies women appear to have less control over resources and over their destinies than do men. Increasing female education is one widely advocated means of removing or reducing these inequities. It is claimed that more education would increase women's productivity, strengthen their bargaining positions and increase the number of options in their lives. Another distributional consideration is

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<sup>6</sup>There are claims, for example, that greater population increases pollution and other negative environmental negative externalities. There are also claims that there are negative externalities to more children because of the excess of social over private costs for education and health services. If there are negative externalities to having children for these or other reasons, then there will be social benefits in terms of reduced negative externalities if more-educated women have fewer children. It should be noted, however, that there are likely to be other means to obtain such ends that are more direct and more effective. These include measures to reduce the differences between private and social costs (e.g., by raising prices) of various activities ranging from attending school to using common grazing or forest lands. See the discussion in Section 7.1 in Behrman (1991) regarding policy choices.

that female access to education is likely to shift a larger share of resources to children (Schultz 1991).<sup>7</sup>

For all of these reasons, female education is of special interest to development strategy in general and to educational policy in particular.

### 1.3 Outline of this Summary Paper

Section 1 of this paper provides an introduction and background information. Section 2 describes recent experience with female schooling and examines the extent of the gender gap in schooling in the countries of Asia and the Near East. Section 3 summarizes the analytical framework for measurement of the determinants of and the impact of female education and the analytical framework for evaluating policy options. It also summarizes available systematic empirical studies on female schooling and overall policy implications.

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<sup>7</sup>However, it is not clear that this is a move towards equity since there has been a secular trend towards increasing per capita income in most of the Asia and Near East regions and in the developing world in general, so future generations probably can be expected to be better off than present generations.

## 2. CHARACTERIZATION OF FEMALE SCHOOLING AND RELATED GENDER GAPS IN THE ASIA AND NEAR EAST COUNTRIES

The gender gap in education and other human resources is large in some countries in Asia and the Near East, with considerable variance across countries.<sup>8</sup> Using cross-country data, it is possible to characterize the magnitude of and changes in educational gender gaps.<sup>9</sup> Data from the World Bank (1990) are presented in Table 1, "Salient Characteristics of Education in the Asia/Near East Region."<sup>10</sup>

Table 1 presents a row of information for each country included. The countries are grouped geographically (i.e. South Asia, East Asia, Egypt/Europe and Middle East/North Africa). At the bottom of the table, information on "country group means" is presented. Country groups are defined as in World Bank (1990) as low-income, middle-income and high-income.

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<sup>8</sup>In Behrman (1991), I also review gender gaps in other dimensions of human resources in the Asia and Near East regions and related variables that pertain to the context for gender gaps in these countries.

<sup>9</sup>For other recent characterizations of the gender gap in school enrollment rates with particular emphasis on the Asia and Near East regions, see Cuarda, Anderson, Moreland, and Dall (1988), El-Sanabary (1989), and Khan (1989). For more broad recent perspectives on the gender gap in developing countries, see Cuarda, Anderson, Moreland, and Dall (1988), Haddad, Carnoy, Rinaldi, and Regal (1990), King (1990), King and Hill (1991), Lockheed and Verspoor (1990), Schultz (1990), and Sen (1990).

<sup>10</sup>In Behrman (1991) I also present estimates of the extent to which individual countries in Asia and the Near East fall below or are above the average values for all developing countries controlling for per capita income (with the control based on cross-country regressions). I refer in what follows to such results as ones that control for real per capita income. For some of the key variables, the graphs in the appendix present these regressions (or the average experience for all developing countries controlling for per capita income) and indicate whether the data for specific Asia and Near East countries are above or below the average experience of all developing countries once there is a control for per capita income.

Most of the Asia and Near East countries in Table 1 are in the low-income group (all those in South Asia, Indonesia and Burma/Myanmar in East Asia, Yemen PDR in the Middle East/North Africa) or the middle-income group (all of the rest except for Singapore). Some of these data are also presented in graphs of the appendix. The graphs plot four variables related to female schooling against per capita GNP in United States dollars for 1987. The four variables plotted are 1) the ratio of female enrollments in primary school relative to the size of the female primary school age group (in percentages), 2) the same ratio for secondary school enrollments, 3) the number of females enrolled in primary school per 100 males, and 4) adult female illiteracy. Each graph also indicates the regression line based on developing countries with GNP less than \$2,500 so that it is possible to see if the values for the particular countries that are included in the graphs are above or below the average experience of poor countries, controlling for per capita income.

Before turning to any analysis of the information presented in Table 1 or the graphs, it is useful to emphasize that there are substantial limitations to such analyses. Definitions are not necessarily consistent across countries, so apparent differences may be due to measurement errors rather than to real differences across countries.<sup>11</sup> In addition, data on many variables of interest are not included. For example, data are available only on indicators related to formal schooling and not on indicators related to any other form of

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<sup>11</sup>The notes to the tables in the World Bank (1990) from which these tables are constructed indicate some of the measurement problems, as do the original sources from which the World Bank obtained these data. Also see Section 4 in Behrman (1991) for discussion of related measurement problems.

educational investment.<sup>12</sup> Despite such limitations, use of this information is widespread because of a lack of better options. The percentage enrollments by age groups in primary, secondary and tertiary schooling in Table 1 suggest the following points:<sup>13</sup>

#### A. Total Enrollment Levels/Rates

Approximately half of the countries in Asia and the Near East had total enrollment levels in 1965 below those for their respective country groups as defined by per capita GDP.<sup>14</sup> Likewise, countries in Asia and the Near East on the whole appear to have had average enrollment rates in comparison to all developing countries once one controls crudely for per capita income in 1965. Some countries did stand out below (e.g. Bangladesh, Nepal, Pakistan, Papua New Guinea, both Yemens, and Algeria) or above (Sri Lanka, Philippines, Singapore Tunisia, Jordan, and Lebanon) the averages.

In all of the countries of Asia and the Near East for which data are available, for both males and females at every level of schooling enrollment rates increased

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<sup>12</sup>El-Sanabary (1989) claims that similar gaps to those for formal schooling also exist in technical and vocational education in countries in the Middle East and North Africa. Also the literacy indicator reflects the impact of whatever forms of education affect literacy -- whether formal schooling, literacy programs or informal education.

<sup>13</sup>These comments are based on the ratios (in percentages) of students enrolled in each level of schooling relative to the numbers of children in related age groups as in the first ten columns in Table 1. Net primary enrollment ratios are available for only a few countries. For the countries for which they are available, they suggest the same relative patterns, though of course the levels are lower.

<sup>14</sup>The country groups in these tables refer to 1988 per capita GDPs, but most of the countries in the Asia and Near East regions were in parallel broad country groupings by per capita GDP measures in the earlier years (the 1960s and 1970s) for which data are given in these tables. However, some -- such as Thailand and Singapore -- moved up one country group during this period.

between 1965 and 1987.<sup>15</sup> The changes varied considerably across countries, with some tendency for larger increases in countries with lower enrollment rates in 1965. Between 1965 and 1987, for example, those countries with the largest increases in total primary school enrollments were 82 percent for the Yemen Arab Republic, 62 percent for Nepal and 48 percent for Indonesia (as compared with an average of 31 percent for all low-income countries). At the other extreme, among countries with higher primary enrollment rates in 1965 (but with total primary enrollment rates below 75 percent), increases were generally smaller, with only a 10 percent increase for Bangladesh, 12 percent for Pakistan and 14 percent for Morocco. Similar patterns existed in enrollment rates at the secondary school level. At the tertiary level, the largest increase was the 19 percent increase in the Philippines, which had an enrollment rate in 1965 that already was above that reported for all but one of the countries of Asia and the Near East in 1987. Increases greater than 10 percent were also reported for Thailand (18 percent) and Egypt (13 percent).

#### **B. Female Enrollment Rates**

Female enrollment rates for primary and secondary school (data are not given for tertiary school in World Bank (1990)) were lower in 1965 and in 1970 in all of the Asia and Near East countries than for their respective country group means--with the exceptions of secondary school in Sri Lanka in both years and in Singapore in 1970.

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<sup>15</sup>The single exception to this statement is primary school enrollment in the Philippines, for which there was a decline for both males and females between 1965 and 1987. But this is not an exception of significance since the decline was from 113 percent (111 for females) in 1965 to 106 percent in 1987.

(Again, there were substantial variations across countries.) For example, for the countries for which 1970 data were available, the range of ratios of female to male enrollments was from 10 to 89 percent for primary school and from 3 to 103<sup>16</sup> percent for secondary school. Thus, gender gaps in school enrollments were pervasive 20-25 years ago, but varied substantially across countries in Asia and the Near East and tended to be greater for secondary than for primary school.<sup>17</sup>

Enrollment rates in Asia and the Near East generally increased more rapidly for females than for males between 1965 or 1970 and 1987.<sup>18</sup> Between 1965 and 1987, the exceptions to this generalization at the primary school level were the Yemen Arab Republic, Egypt and Algeria (with equal percentage increases for males and females in the last two cases). Exceptions at the secondary school level were Tunisia, Algeria, Pakistan, Papua New Guinea, Morocco and Egypt (with equal percentage increases in the last case). For every country in the Asia and Near East regions for which data are available, the number of females enrolled in primary school per 100 males increased at both the primary and the secondary school levels

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<sup>16</sup>These numbers are the ratio of those actually enrolled in a given school level relative to the number of individuals in a country of a specified age range. As a result, if there are students enrolled who are younger or older than the specified age ranges, percentages may exceed 100.

<sup>17</sup>From the broader perspective of all developing countries, King (1990) observes that such gender gaps tend to be greater in lower per capita income countries. This is confirmed in the regression estimates in Behrman (1991). The coefficients of the linear per capita real income terms are significantly higher for female than for total primary and secondary school enrollments, which implies a closing of the gender gap in enrollments with higher per capita income (modified somewhat by the quadratic terms in real per capita income).

<sup>18</sup>This is consistent with the regression results in Behrman (1991) that indicate significantly stronger per capita income responses in female as compared to male enrollments given that per capita income generally increased in Asia and Near East countries in this period (see column 3 in Table 3 in Behrman 1991).

between 1970 and 1987. Particularly large increases were recorded at the primary school level in Oman and at the secondary school level in Jordan, Malaysia and Tunisia.

In comparison to other countries in the same income groups, female primary and secondary enrollment rates in 1987 in countries in Asia and the Near East tended to be low.<sup>19</sup> But with more extensive control for per capita income through cross-country regressions (see the graphs presented in the appendix), the countries of these regions appear to be closer to the overall experience of developing countries. A number of countries have higher female enrollment rates than predicted with the control for per capita real income. Thus, considering the regions as a whole -- particularly if the relative populations of different countries are considered -- the Asia and Near East regions have approximately average female enrollment rates.

### C. Persistence Rates

Among those enrolled in primary school in 1970, the persistence rate to grade four in countries in Asia and the Near East tended to be relatively low, and lower for females than for males. But the gender gap in these persistence rates was much smaller than the gender gap in enrollments and, at times, favored females (e.g. Sri Lanka, Thailand, both Yemens). Relatively large gender gaps in persistence rates (i.e. with differences larger than 10 percent) were reported for Indonesia and

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<sup>19</sup>King (1990, p. 5) states: "Regional differences in the gender gap are great. Many countries have achieved near universal primary education for males and females. But girls' enrollment continues to lag behind in many others, most dramatically in South Asia, the Middle East, North Africa and Sub-Saharan Africa."

Burma/Myanmar (favoring males) and for Sri Lanka and the Yemens (favoring females).

Persistence rates to grade four as a percentage of the number of students who entered primary school increased substantially between 1970 and 1987 (for the cases in which data are available for both years and in which the 1970 rates were low). In the relatively few countries for which data are available, the increases tended to be larger for males than for females.

**D. Comparison of the Stock of Educated Males and Females**

As a result of gender gaps in school enrollment and persistence rates in most of the Asia and Near East regions, the stock of educated males in most countries of the regions is larger than the stock of educated females. A comparison of adult and female illiteracy rates in 1985 (Table 1, last two columns) is an indicator of this difference. Female illiteracy rates exceed the overall rates in every country in the Asia and Near East regions. The residuals from the cross-country regressions also indicate that, controlling for per capita real income, female (and total) illiteracy rates are high in the Asia and Near East regions in comparison to the rate for all developing countries. There are striking exceptions to this generalization in Sri Lanka, the Philippines, Thailand, and Indonesia (and for males in Jordan).

### **3. SUMMARY OF ANALYTICAL FRAMEWORK, RECENT SYSTEMATIC STUDIES AND POLICY IMPLICATIONS**

Section 2 suggests that there is a persistent gap between female and male formal schooling in most of the Asia and Near East regions, though the gap has varied enormously between countries. Differences in school enrollment rates have lessened over the past two decades throughout the regions, and may have been eliminated in Sri Lanka and in some East Asian countries. Nevertheless, these differences remain considerable in many countries. In addition, enrollment rates refer only to the current flow of investment in formal schooling and do not reflect evidence of gender gaps in investment in forms of education other than formal schooling. Even though the gaps between female and male access to schooling (at least in terms of enrollments) have been declining in the Asia and Near East regions in recent decades, the gender gaps in the stock of educated adults are likely to remain for decades in most countries in the regions.

Such gender gaps in schooling raise important questions. Are such gaps sensible from the efficiency point of view? What are the implications for concerns about equity? What are the implications for policy? To address these questions, it is necessary to first define what is known about the causes of gender gaps in schooling and the impact of increased female schooling. Effective policy decisions can only be made with this knowledge.

### **3.1 Analytical Framework, Measurement and Estimation Problems and Policy Rationale**

To establish a framework for analysis of such questions, consideration is given to modeling education investment decisions, to measurement and estimation problems, and to the analytical rationale for policy interventions. Modeling suggests how a number of dimensions of demand and supply for education may interact to create incentives that affect female education within the broader context of household behavior and current and expected market options. This modeling also suggests that controlling for other factors in the estimation of the impact of female education is likely to be critical to avoid biased estimates. Examples of these factors include intellectual ability, motivation levels, health status and family or social support for education. Therefore, to determine the impact of female schooling on some outcome such as wage rates or child health, it is important to control for these other factors. The strong association between schooling and various outcomes of interest may be due not solely to the effects of schooling per se, but in part to the fact that schooling is associated with ability, motivation and family background. To understand the impact of increased female education alone (and not the associated factors), it is important to control for these other associations. But, disentangling the effects of female education from those of a number of other variables -- such as intellectual ability, motivation, family background and preferences -- is difficult with available data.

Increasing economic efficiency may be one major reason for promoting policy interventions.<sup>20</sup> Increases in efficiency mean that, given constraints on available resources, everyone can be made better off by reallocating those resources among various uses so that the marginal social returns to resources are more equalized across uses. For example, the social benefits of increased female access to education may exceed the private benefits due to the impact on female education on limiting contagious diseases. In such a situation, the private incentives to invest in female education may be inadequate from a social point of view since they do not incorporate the social benefits of preventing the spread of contagious diseases. By increasing private incentives to the point at which they reflect the social benefits, efficiency is likely to be increased. Considerations such as this point to the need to identify some market failure -- perhaps due to externalities or increasing returns to scale or public goods -- to rationalize policies that are advocated on the grounds that they increase economic efficiency. Such considerations also point to the existence of a policy hierarchy, in which policies that more directly address the specific market failure of concern tend to be relatively preferable from an efficiency perspective (all else equal). Evidence from other contexts suggests a priori that policies that work through prices (i.e., subsidies, taxes) are likely to be preferable over regulations because the costs are more transparent and the effects are not as likely to be altered so much in unanticipated ways due to unanticipated developments.

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<sup>20</sup>Economic efficiency may have a static component related to production with given resources at a point of time and a dynamic component related to growth over time.

Of course, there may be reasons other than efficiency for promoting policy interventions in female education. The primary other reason is a concern for the distribution of the command over resources among members of society. From the point of view of concern about such distribution (for example, concern with equity), it may be desirable to use policies that result in increased inefficiencies. But there still remain a range of policy choices with different costs in terms of efficiency and productivity, so the efficiency concerns still provide guidance.

### 3.2 Recent Systematic Empirical Studies

Existing systematic empirical studies raise a multitude of questions that merit further research and argue for the repetition of some of the more interesting available studies to test their validity under different conditions. Nevertheless, these studies suggest a number of insights into the determinants of and the impact of female education (largely schooling).<sup>21</sup>

Gender gaps in education in the countries of Asia and the Near East have been subject to some, but relatively little systematic empirical analysis. A study on India suggests that expected gender gaps in paid female employment rates are a significant factor in creating a gender gap in human resource investments, presumably including formal schooling and other forms of education (the payoff to which is largely in the wage labor market). A

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<sup>21</sup>This section summarizes the results of a fairly large number of recent studies. To keep the summary as concise as possible, references are not given here to the individual studies. All the references are given in Behrman (1991), to which the reader interested in more details is referred.

study on Pakistan suggests that total demand factors are quite important in determining the total gender gap in cognitive achievement, though their relative importance is lessening over time. To the extent that expected differential labor market returns underlie gender gaps in education, policy changes that improve labor market conditions for women are likely to induce an increase in female education. But with regard to formal schooling, this is a long process given the gestation for such education. Furthermore, gender differences in wage rates do not necessarily imply the same gender differences in the rates of return of investing in education. For example, recent studies on Indonesia and Thailand suggest that the labor market rates of return of investing in the post-primary schooling of females exceed the rates of return of investing in the same schooling levels for males, even though average wages are higher for men than for women. This is the possible because the gender gap in wages narrows considerably with more schooling in these economies. A study on Indonesia also suggests that improvements in health of young children and infants may have a substantial positive effect on secondary schooling of girls by reducing their time spent home with sick younger siblings. A study on Pakistan suggests that in rural areas of that country, a large factor underlying a large gender gap in cognitive achievement is a gender gap in the public provision of schools. In a sense this is a positive result for those concerned with eliminating such gender gaps since relatively immediate effects may be obtained through changing school policies without having to wait for the trickle down effects of labor market changes or worry about the tricky implications of attempting to change preferences.

The impact of female schooling on paid labor market outcomes and on nonmarket outcomes in the Asia and Near East regions and elsewhere has been subjected to more

systematic studies. These suggest that the much larger number of "standard" studies that interpret simple or multivariate associations as reflecting causality may be misleading in a number of respects. The failure to control for sample selectivity seems to cause biases in both directions of the estimated effects of women's schooling on such outcomes, but underestimates the extent to which the paid labor market rates of return to schooling for women exceed those for men in the available studies for the Asia and Near East regions on Indonesia and Thailand. Failure to control for other factors -- such as individual ability and motivation, household encouragement, the quality of schooling, and community learning and employment opportunities -- seems to result in substantial overestimates of the impact of female schooling in standard studies. Estimates that control for such factors imply that the true impact of female schooling on both paid labor market and other outcomes is substantially less than often claimed. Nevertheless the effects of female schooling appear widespread and important, even though existing studies of nonmarket effects do not present implied rates of return in such activities. The studies reviewed also suggest some nuances of these effects that have not been the focus of most standard studies: for example, substantial gross substitution possibilities between women's and men's schooling in household production in Egypt and Thailand, but not so large that such substitution precludes important intragender, inter-generational links in Malaysia and the Philippines.

### 3.3 Policy Implications

I consider, in turn, implications for general policy considerations relating to efficiency and growth, for those related to equity, and for more specific policy options.

#### A. Implications of the empirical estimates for the contribution of female schooling to productivity on a general level:

There are at least three important such implications. First, even if more careful analysis substantially moderates the estimated impact of female schooling on various outcomes related to productivity, it still implies that female schooling has a substantial effect on various dimensions of productivity. The estimated rates of return to formal schooling in terms of narrowly-defined economic outcomes are fairly large. But, in addition there are effects on nonmarket outcomes. Though there are not estimates that translate the nonmarket outcome effects into rates of return, the nonmarket effects mean that the narrowly-defined economic rates of return are a lower estimate for the total rates of return to female schooling. Therefore countries in the Asia and Near East regions and elsewhere are likely to gain in terms of productivity and growth from more female schooling, all else equal.

Second, this is not to say that the available estimates suggest a strong reason on efficiency grounds for policies that induce more investment in female schooling considered in isolation. In fact the available studies provide very little information on the existence and

importance of factors such as technological externalities, increasing returns to scale, capacities for dealing with disequilibria that have social benefits beyond the private benefits, and social benefits beyond private benefits in the production and diffusion of knowledge. That the productivity effects in a range of female schooling activities are probably considerable does not imply that there is an efficiency reason to have policies that directly or indirectly subsidize female education. In the available studies, the estimated effects are basically private effects, not social effects.

It is true that many estimates of the paid labor market rates of return to schooling purport to be for the social rates of return, but the implications of these studies is not that the social rates of return to such schooling are higher than the private rates of return. To the contrary, the way that these estimates are calculated, the estimated social rates of return are lower than the estimated private rates of return. This is the case because the calculation of these social rates of return basically involves an adjustment to the cost side for the costs of public subsidized inputs (e.g., public schools that charge fees that are less than their marginal costs, with the differences covered by public subsidies). Therefore, if this is the only important adjustment between the private and the social rates of returns, the policy implication from the point of view of efficiency of these estimates of the social rate of return is that school prices should be raised to eliminate the distortion between social and private returns to schooling, and not that there should be greater subsidies for female schooling.

At times important nonmarket effects of female schooling are interpreted to mean that there are efficiency reasons for policies that favor female schooling. But that conclusion does not necessary follow. Many of the nonmarket benefits are private benefits. Better

health for a woman or for her family because she is better educated has a considerable private component to the total benefit. The available studies do not provide evidence with which one can claim confidently the magnitudes of externalities that might justify policy interventions which favor female schooling.

Some people think that there are important negative externalities associated with population growth, including pressures on public health and schooling systems and increased pollution and environmental degradation. If this is the case (which is a matter of considerable debate) then it may be a reason for advocating policies that promote female schooling in order to reduce such negative externalities. The considerations underlying the discussion of the policy hierarchy, however, would not point to increased female schooling as a first-best policy. The first-best policies are ones that are aimed directly towards the distortions. If there are social costs above private costs of population increases due to public subsidies for curative health and education, the first-best policy from an efficiency perspective is likely to be to increase the prices for those services to the point at which the prices equal the social marginal costs of the provision of such services. In such a case there is a policy-based distortion that efficiency considerations suggest should be removed. If there are social costs to contagious illnesses, the first-best policy is not likely to be to increase female schooling, but to increase information about such diseases, vaccinations, monitoring, improve water supplies and sanitation, etc. If there are negative externalities of population growth in the form of increased pressure on common grazing, forest, soil and water resources, the first-best policy is likely to be appropriately pricing access to such resources. The point is that increased female education, while possibly working in the right direction

to help eliminate such distortions, is not likely to be the first-best policy.

Third, with regard to the allocation of resources between female and male schooling, the empirical evidence supports some shift of resources toward females. The estimates tend to indicate that the rates of return in narrow economic terms are equal or higher for investments in female than investments in male schooling. In addition, evidence on the nonmarket impact of female schooling reinforces the argument for shifting resources from male to female schooling even though the nonmarket impacts of female schooling are probably not as strong (nor as much greater than the impacts of male schooling) as is often assumed. These considerations certainly do not support maintenance of the present gender gap in schooling enrollments favoring males in most countries of Asia and the Near East, but, if anything, the reverse of it. To the extent that this gap arises from policy-related supply considerations, then efficiency considerations argue for elimination of the gender gap in schooling supplies that currently favors male enrollments. Effectively there are policy-based distortions, the removal of which would increase efficiency. To the extent that the enrollment gaps are due to demand factors, then the implications are less clear depending upon the nature of such factors. If they are based on poor information regarding the relative returns to investing in female versus male schooling, for example, there probably is an efficiency case for providing better information (since typically information has "public good" characteristics that lead it to be under-provided by private sources). If, on the other hand, they are based on preferences that view the public interaction of females with males negatively, then this component of demand differences may not reflect inefficiencies, but rather that the available estimates do not adjust for gender differences in disutility costs for

paid labor force participation. Of course, others might have different preferences, but it is not clear why such preferences are preferable to those of the individuals concerned. This is a tricky area since current behavior may reflect not only the possibility of different preferences, but also how such preferences are weighted -- that is, who has political power at levels ranging from the household to the nation state.

**B. Implications of available estimates of female schooling for concerns about equity:**

There is much less ambiguity regarding equity than regarding efficiency in considering female schooling in isolation (though about the same as in considering the efficiency of the gender gap in schooling). If society were to weigh all persons equally,<sup>22</sup> the present gender gap in formal schooling enrollments in most countries of Asia and the Near East probably is inequitable. There is a conceptual possibility that there are other forms of education that are offsetting. For example, girls who are not in school may be obtaining informal education in household productivity that is of equal value as would be formal schooling. While that is possible, it is doubtful for two reasons: First, the available evidence suggests that formal schooling has important effects on household production and that females who obtain more formal schooling (at least over the range relevant for most countries of Asia and the Near East) are more productive in terms of nonmarket outcomes. Second, even if informal education were as useful as formal schooling for females in some relatively stable traditional historical contexts, it is likely to be much less useful in dealing with rapid changes and

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<sup>22</sup>The desirability of such equal weights, once again, is a value judgement that, as an individual, I find attractive but it is not clear that I have anything special to say as a social scientist about the desirability of such equal weights.

uncertainty that are likely to be prominent dimensions of the future. There is also the conceptual possibility that, given preferences, the gap is perceived by the individuals involved to be appropriate due to differential disutility costs of female versus male involvement in certain activities. But the possibilities of rapid change and uncertainty in the future lead me to discount this explanation and its implication that measured gender gaps do not reflect real gaps.

**C. Considerations of more specific policy options:**

Actual policies take specific forms, such as increasing fees at universities, conducting literacy campaigns for women, or establishing formal training programs for women. Adequate evaluation of specific options in a particular context requires substantial specialized knowledge of a number of dimensions of local conditions and institutions. These conditions vary enormously even within some of the countries in Asia and the Near East, to say nothing of across countries. A broad survey such as this can only be suggestive regarding what is known and not known about policies from a more general perspective. Subject to such caveats, the material in this survey does provide some basis for being more specific.

Policies related to the demand for female education: The analytical framework suggests that an important determinant of female education is various components of household demand for such education. This demand, in turn, is related to current or expected conditions in various markets and regarding public services, as well as to current and expected nonmarket activities and gender specializations.

A widespread perception is that imperfections in capital markets are common in most countries of Asia and the Near East and other developing countries and have negative ramifications, particularly for the poor who tend not to have much access to such markets. But the available systematic studies suggest limited effects of capital market imperfections on schooling. Nevertheless, since there are many who believe that capital markets are fairly imperfect in Asia and Near East and other developing countries, it may be of value to undertake some pilot projects that attempt to measure the impact in different country contexts of different loan programs for investments in female education for those from poor households, with careful monitoring and controls. The monitoring problems mean that these programs may have to be limited to formal education -- either schooling or training programs. The effort to limit beneficiaries to those from poor households would raise the usual questions of what mean tests or what other information would be used to determine eligibility. Favoring females could be justified by the efficiency and equity considerations that are summarized above.

Common sense and the analytical framework suggest that one important component of the demand for education is the expected impact on subsequent outcomes. The empirical estimates seem to be consistent with this emphasis. Therefore it appears that expectations of better access of women to labor market options would increase demand for their education. Such expectations might be formed in part by policies that serve to eliminate any discrimination against women in those markets. Such policies would have efficiency gains as well in terms of the increased productivity of women currently in the labor force or the productivity of those who would be induced to join the labor force with such changes. If

there is imperfect information about the productivities of women in some activities, perhaps because such activities are new or because historically there has been little employment of women in these activities, there also may be an efficiency reason to have policies that induce or require production entities in such activities to learn more about women's productivities through employing more women. Since such policies would be intended to improve information, they should be transitory. But if they are announced as transitory, they are likely to be less credible and therefore less effective, so a trade-off seems inevitable in this regard.

Demands for education are household demands that reflect the overall allocation of resources that occur within the household and the various constraints under which the household operates. Some of the studies summarized in this review, for example, suggest that the opportunity cost of time of older daughters in household production activities (explicitly in one case, care of younger sick siblings) has a substantial negative effect on their school attendance. In such cases policies that lead to improved health of younger children and infants would increase school attendance for older girls and might also induce more training and stronger job attachments for older females. Such possibilities mean that the efficiency and equity arguments for policies that improve child health may be stronger than it would appear from considering only the direct effects on child health, and should be incorporated into the analysis of such policies.

A related issue is the nature of child-care arrangements. If household structure in the Asia and Near East regions continues to change so that nuclear households become more common, the nature of child-care arrangements may be of increasing importance for

female education directly (both for schooling for older daughters and for training for women) and indirectly (by affecting expectations regarding labor market and own-enterprise options and the possibilities of more extensive job attachments). Though there are not systematic efforts to explore the impact of alternative child-care arrangements in the Asia and Near East regions that were uncovered in this survey, this is likely to be a topic of increasing interest. Some pilot projects well might be warranted. There are examples from other developing countries that are suggestive. A Colombian community day care program, for instance, is said to have enabled approximately 200,000 girls and an equal number of women to attend school or work, with estimated coverage of 1.5 million by 1992. In Ghansu province in China some schools allow girls to bring their siblings to school in order to increase the girls' school attendance.

Policies related to supply side for female education: If the supply of educational institutions increases, at least in some contexts in the Asia and Near East regions, the impact is likely to be substantial. A study on rural Pakistan concludes that the gender gap in (single-sex) school availability accounts for much of the large gender gaps in school attendance, completion of various schooling levels, and cognitive achievement. In such a case there is a policy-induced distortion that probably causes both inefficiency and inequity. The policy remedy would be to equalize access to schools for females and males. Experimental programs are underway in the Asia and Near East regions and elsewhere in the developing world that suggest that female access to schooling can be improved by incorporating factors such as: 1) satellite feeder schools in remote rural areas for the initial grades, 2) flexible hours, 3) hours that do not conflict with other activities, and 4) greater flexibility in seasonal patterns.

On a priori grounds, increased quality of educational institutions is likely to increase the rates of return for any given period of time spent by an individual in that institution (unless there is an even greater upward shift in the cost of education associated with the improvement in quality). Some studies for other developing countries suggest a substantial impact of the quality of schooling on test scores and on post-school labor market outcomes. The studies reviewed in this survey for the countries of Asia and the Near East report significant but not very substantial effects of schooling quality. There is also little systematic empirical evidence related to the efficiency of the use of inputs in educational institutions in the countries of Asia and the Near East, though one study on Thailand does suggest that private schools are more efficient and more cost-effective in that context. Therefore, experimenting with variety of educational institutions -- public and private -- with careful control for selectivity of students in the analysis, may prove quite valuable in improving the policy basis for recommendations regarding these issues.

There are a range of existing or conceivable female education programs in the Asia and Near East regions. Such programs can be undertaken in many locations as well: through institutions designed for such purposes, in institutions designed primarily for related purposes (e.g., educating mothers about child nutrition at health clinics), at work sites, and in households. Further, policies can affect such programs through a range of means including direct governmental supplies of education, governmental regulations and price/subsidy/tax policies that affect private suppliers, individual taxes and subsidies. There is very little systematic evidence that permits one to sort confidently among these alternatives. The one topic on which there is a fair amount of evidence is the relative rates

of return to various levels of formal schooling. Many claim that returns are much higher for primary than for higher levels of schooling. However, the studies reviewed in this survey suggest that standard estimates substantially overstate the returns to primary as opposed to higher schooling levels; these studies fail to control for estimation problems such as selectivity and for grade repetition and school dropout rates. Moreover, the evidence on positive externalities is mostly speculative, and the externalities -- from adding to basic knowledge or from adapting knowledge to be suitable for local conditions -- may be considerable and are more likely to be important for the higher schooling levels. For these reasons, the efficiency arguments for policies that favor lower over higher levels of schooling often appear to be overstated. Nevertheless, the current large discrepancy in public expenditures per student (positively associated with schooling levels) probably means that a shift in resources based solely on efficiency would be toward lower schooling levels. Concerns for equity strengthen arguments for policies that induce such a shift.

There also seems to be a growing consensus that vocational education is less effective than general education in schools. Training conducted in industrial institutes and vocational secondary schools appears less cost-effective than informal, firm-based training. Short courses appear more cost-effective than long courses, though it is not clear that the underlying studies control as well as would be desirable for some important characteristics such as individual abilities and motivations. If the consensus is correct, it may imply that a selective strategy is desirable, with emphasis on generic pre-employment training in low-income countries (where firms usually have very little training capacities) and a focus on training related to new technologies in firm and firm-connected or industry-connected

contexts in middle-income countries.

A related issue is the pricing of publicly-provided education. There are a number of policy proposals which suggest that rather than charging low and uniform prices for different levels and types of public education, selective user fees should be charged for higher and specialized forms of education for which the private benefits are substantial and tend to go to those who are better off (given enrollment patterns by income and socioeconomic class). The extra proceeds could be targeted to ensure greater access to education for those who are poorer. The claim that such policy proposals would lead to greater equity and greater efficiency appears valid, though there remains considerable lacunae in our knowledge of the technical and administrative capacities needed to successfully target educational subsidies. Of course in most societies -- to the extent that there are efficiency and equity arguments for shifting public resources (at least at the margin) in education from males to females -- targeting females to pay lower prices than males does not pose the usual problems regarding whether the recipients are, in fact, those targeted. Furthermore, the problem of households redistributing resources and, thereby, undoing apparently successful targeting does not usually arise for such targeting of schooling by gender since intrahousehold substitution possibilities are likely to be limited.

Research needs: The considerable importance of supply policies in creating a large gender gap in rural Pakistan raises the question of whether supply sources are more important than often claimed in other contexts as well. It would be useful in thinking about policies to know more about similar decompositions of gender gaps in education in other contexts, with expanded details regarding what are the demand factors and what are the

supply factors (including their quality dimensions). There also are important questions about how to induce more efficiency in the provision of education and what role decentralization and parental choice should play. There are a number of technical issues that require further exploration regarding the estimated impact of female schooling on various outcomes. Perhaps most important is that very little is known about the magnitudes of the various market failures -- such as externalities that are at the heart, often implicitly, of efficiency arguments of policies that favor female education (as well as male education). Finally, the more systematic evidence that has been uncovered and reviewed in this survey focuses almost exclusively on schooling, which means that there may be considerable returns to undertaking careful pilot projects and related research which investigates the relative returns to other forms of female education.

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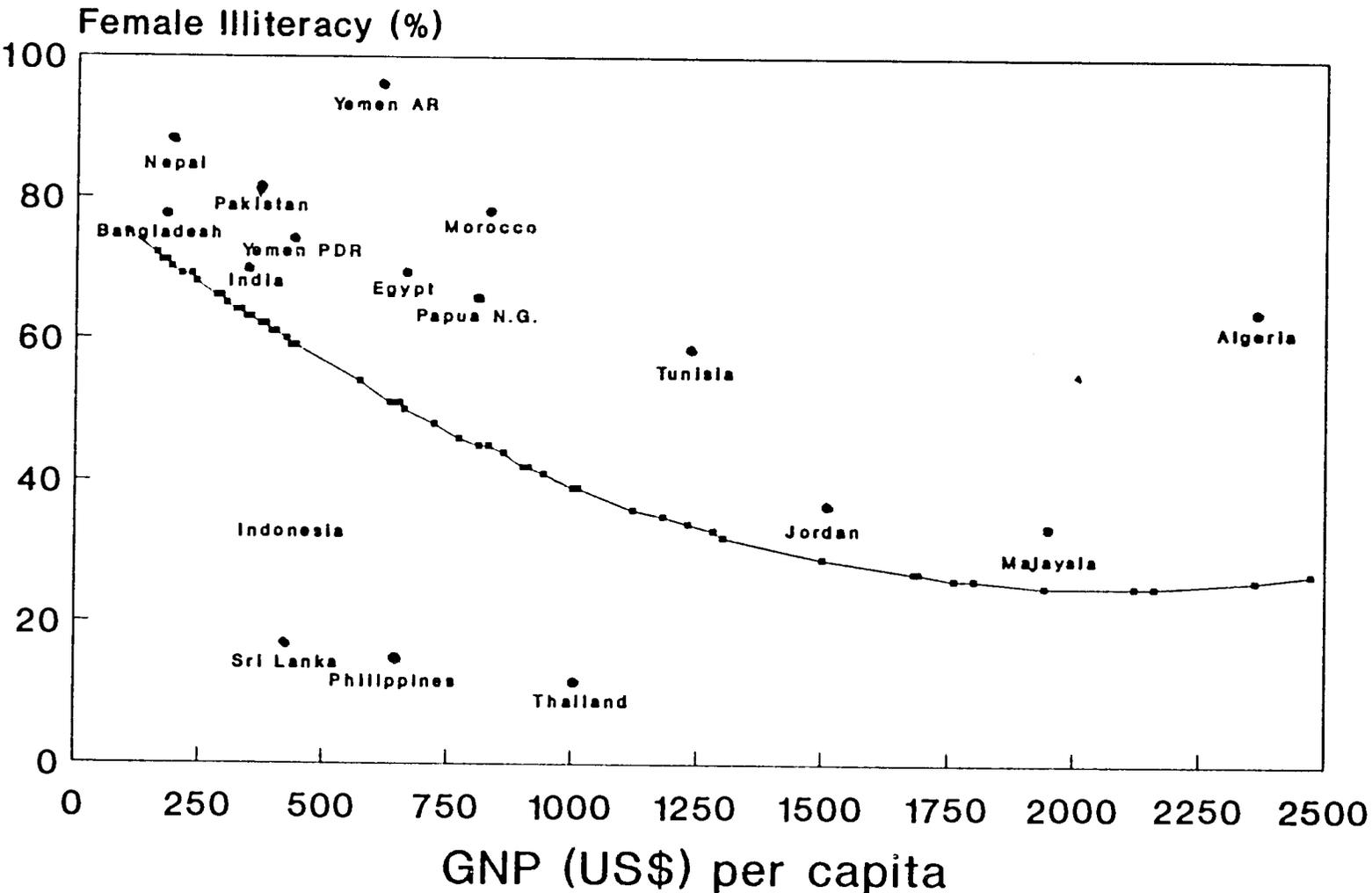
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**Appendix: Graphs of Key Variables Against Per Capita Income  
and Average Experience of All Developing Countries**

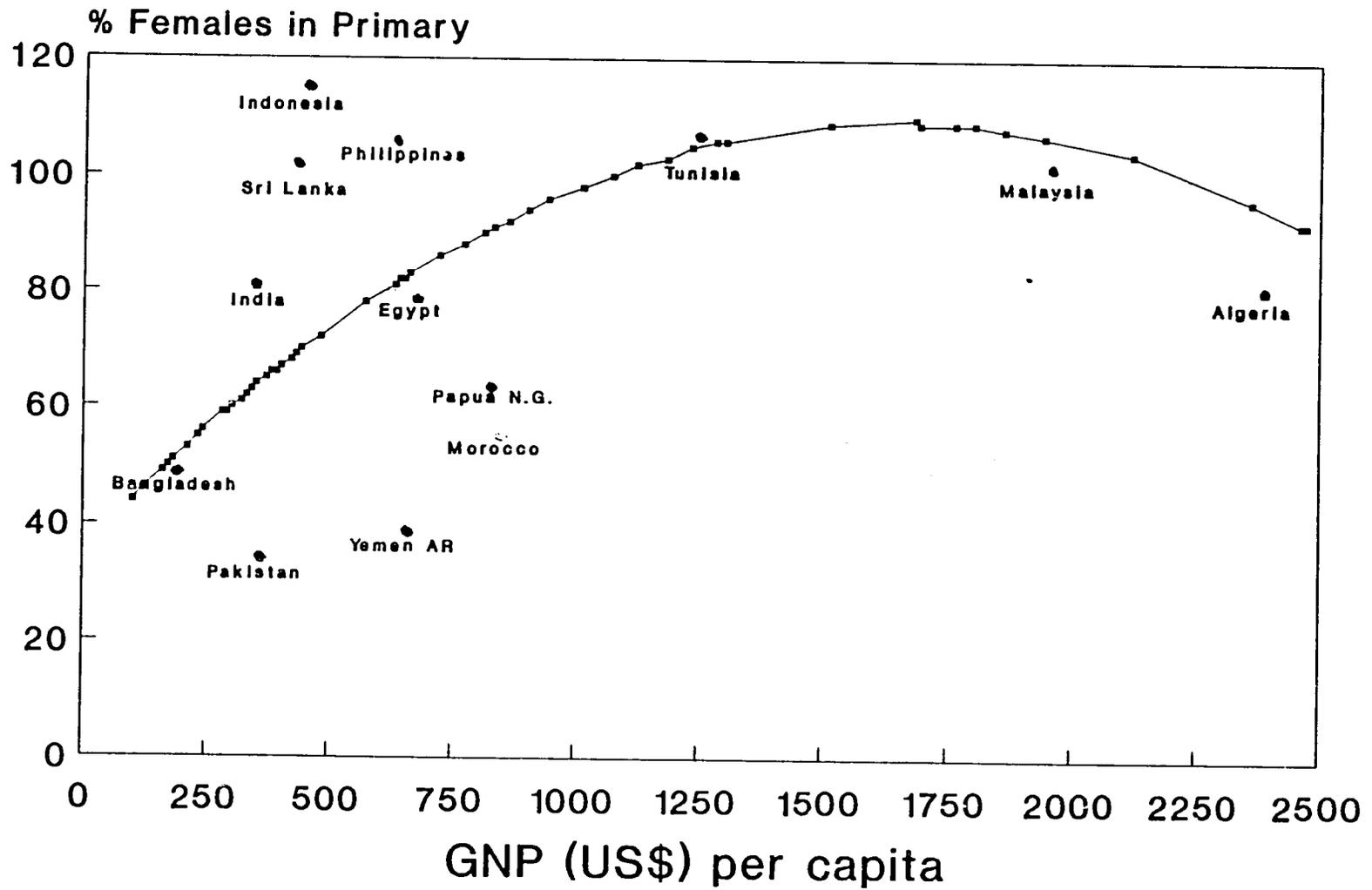
# Female Illiteracy 1985



Regression line represents all developing countries with per cap gnp < \$2500; performance controlled for income.

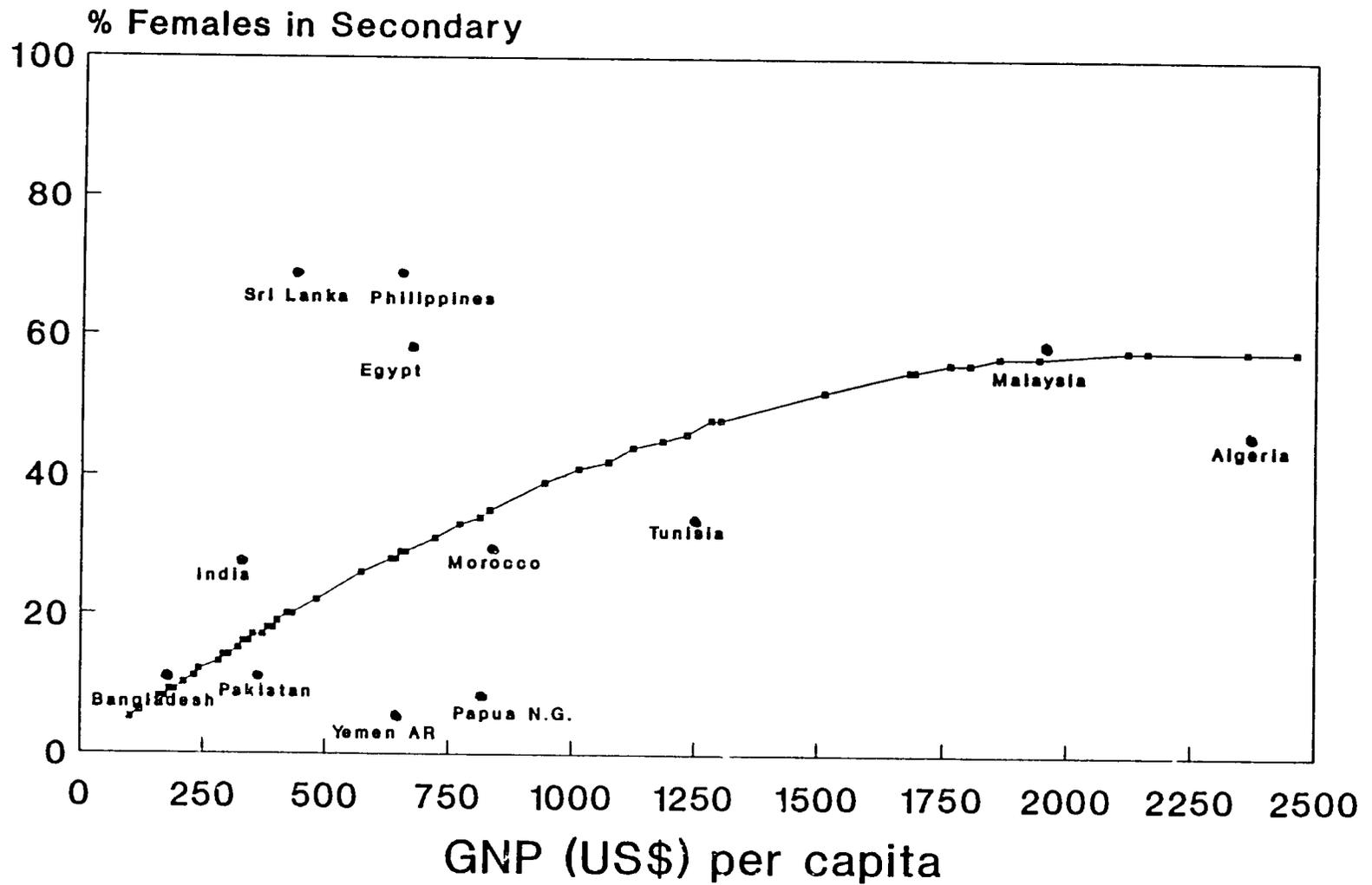
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# Percent of Age Group Enrolled Females in Primary School (1987)



Regression line represents all developing countries with per cap gnp < \$2600; performance controlled for income.

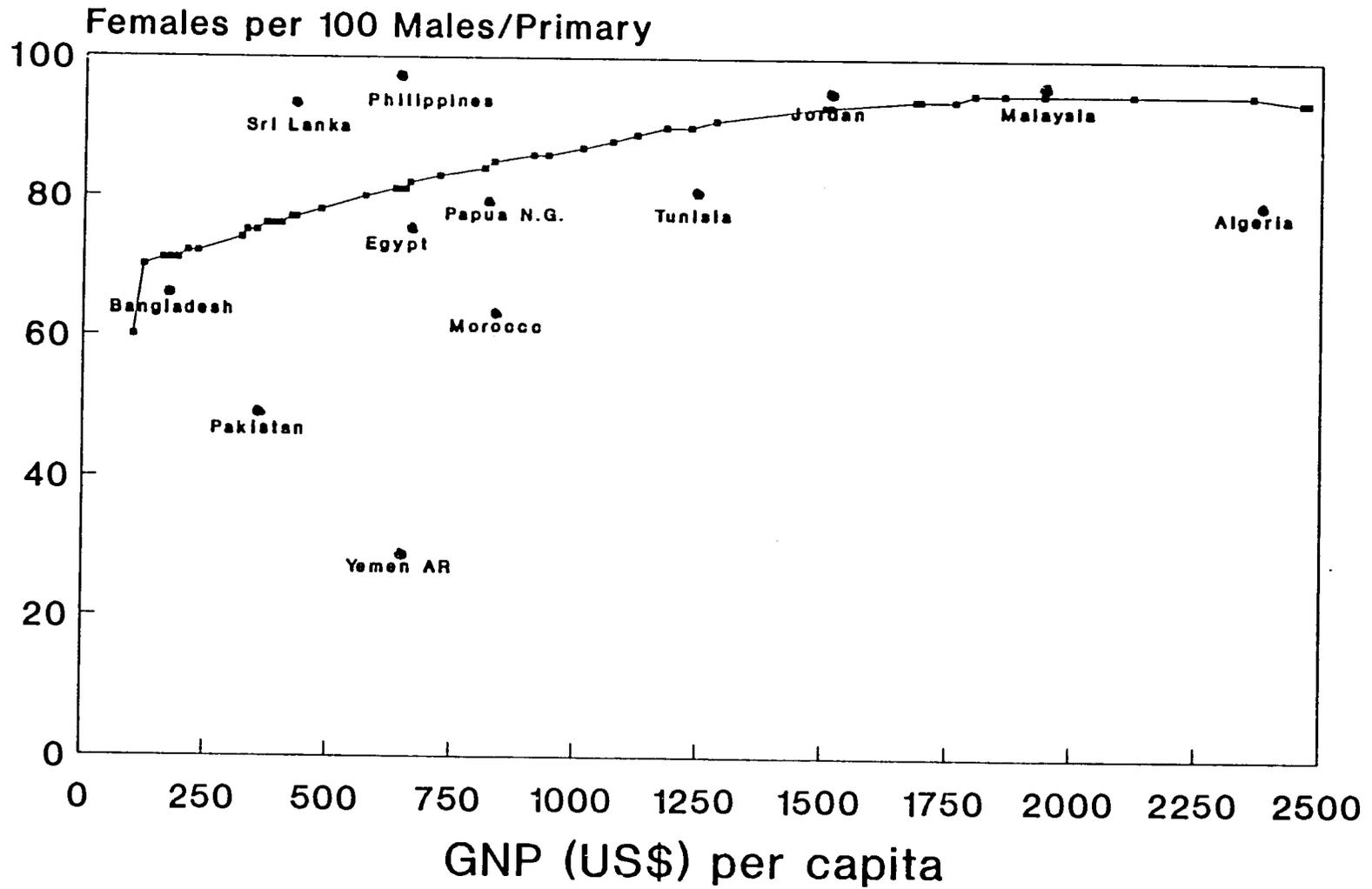
# Percent of Age Group Enrolled Females in Secondary School (1987)



Regression line represents all developing countries with per cap gnp < \$2500; performance controlled for income.

162

# Females per 100 Males in Primary School (1987)



Regression line represents all developing countries with per cap gnp > \$2500; performance controlled for income.

SP