

# Family background, school enrollments and wastage: evidence from Arab countries

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## Abstract

Applying single and recursive bivariate probit models that utilize micro data sets of five countries, this paper examines the concatenation between school enrollments and family background. The empirical analysis captures considerable variations in the pattern of school enrollments and school wastage according to rural–urban locations and family background variables. Income gaps are powerful and interact with gender gap to produce differential school enrollment and wastage patterns. Access to credit partially redresses the adverse effects on school enrollments of negative household economic shocks. The findings call for more concerted government efforts to increase school enrollments and retention and to improve rural education particularly for females and the underprivileged.

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## 1. Introduction

This article utilizes micro-level data of Kuwait, Jordan, Oman, Yemen and the West Bank and Gaza in order to investigate the effects of family background on the patterns and disparities of school enrollments in Arab countries. Such an investigation is called for in light of the renewed interest in the pattern and disparity in school enrollments (Gomes-Neto and Hanushek, 1994; Filmer, 1999; Ravallion & Wodon, 1999) and the relationship between schooling and child labor (Dehejia & Gatti, 2002; Psacharopoulos, 1997; Patrinos & Psacharopoulos, 1997). In the context of the Middle East, a few studies examine school enrollments of disadvantaged groups (Klinov, 1996) or the relationship between child work and schooling (Assaad, Levison, & Zibani, 2000; Khandker, Lavy, & Filmer, 1994; Wahba, 2000). Exist-

ing literature indicates that Arab countries continue to have relatively lagging enrollment rates and high gender disparities in schooling. Understanding the underlying supply and demand determinants of and disparity in school enrollments is important for policy because enrollments are fundamental to the size of the future stock of human resources and because enrollments are key indicators of how the supply and demand for education resources in different countries are balanced. Therefore, this paper has two specific objectives:

1. Study the impact of family background and households' negative economic shocks on the pattern and disparity of school enrollments in the five countries and;
2. Utilize Yemen's 1999 poverty survey in order to analyze the factors that explain the joint decisions of schooling retention and discontinuity.

The rest of this paper is in four sections. Section 2 reviews enrollment rates in the Arab countries and intro-

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duces the estimation methodology and data types, coverage, sources and main variables. Section 3 presents the results of marginal probit models. Section 4 applies a simultaneous bivariate probit model to Yemen's 1999 data and unravels the relative magnitude of factors that cause students to discontinue schooling. Section 5 is a summary of main findings.

## 2. Education enrollments: an overview

Education investments in Arab countries have led to successive increases in primary school enrollment to 30 million by 1990 and to 39 million in 2000. Enrollment rates vary reaching 80% in Jordan, Lebanon, Egypt, Syria and the GCC countries and range between 60% and 80% in Libya and Saudi Arabia and score below 60% in Yemen, Morocco and Sudan (Shafik, 1994). Adult illiteracy rates are high particularly among females: it is estimated that in 1995, there were about 65 million illiterate adults in the Arab world; most were females, 41 million, and 24 million were men (United Nations Educational, Scientific and Cultural Organization, 1995). Accordingly, the region's average years of schooling of 2.8 compares unfavorably with 4.2 years for all developing countries (Economic and Social Commission for Western Asia, 2000; United Nations Educational, Scientific and Cultural Organization, 1999).

Across the urban–rural space and within the same country there are imbalances between primary, secondary and tertiary enrollments and access. Gross enrollment in Saudi Arabia with a per capita income of \$6000 is 78 for boys and 73 for girls. At the secondary level, the respective rates are 54 and 43. Sudan with a much lower per capita income level (under \$400) also has low primary enrollment rates of 60 and 45, and second level rates are 54 and 52 for males and females, respectively. In the mid 1990s, Moroccan net primary enrollments were 58% in rural areas and 85% in urban areas, and Tunisian secondary enrollments in rural areas were as low as 19% while in Tunis they were 78%. Rural enrollment in Upper Egypt is about 20% points less than in Lower Egypt (World Bank, 2000). Yemen provides a striking example of lagging per capita income and educational achievement. Nearly 45% of children in the primary school-going age (6–11) never enter schools and adult illiteracy is widespread at 56% of the total population. Its incidence is highest in rural areas 64% (34% in urban), and among females 74%, double its rate among men (37%).

Drop out rates are high, reaching 53% in Yemen and 28% in Iraq. Reasons for the drop out include unavailability of transportation to and from schools especially in rural areas. Poverty and financial justifications for sending children to work to supplement family income is another reason (ESCWA, 2000). Furthermore, there

exists an important gender gap between enrollment and end-of-cycle completion rates reaching 20% in Tunisia, 25% in Morocco, 37% in Sudan and 45% in Yemen.

The index of inequality<sup>1</sup> in access to education is high, ranging from 0.52 in Yemen to 0.21 in the West Bank and Gaza. Lower bounds are estimated for Kuwait (0.19), Jordan (0.15) and Oman (0.07). The high value of the index in Yemen agrees with literature findings that inequality of education access is most severe in economies with a large rural segment (Ram, 1995). The extent of inequality in access to education is much higher for females in all five countries. In Yemen, the index of 2.52 is nearly fivefold the overall extent of education inequality and Jordan's female inequality of 0.56 is about four times the size of its overall education access inequality, 0.155. Oman's female specific index is 0.19 and in the occupied territories of the West Bank and Gaza, it is 0.71.

### 2.1. Estimation method

The paper applies a combination of single and bivariate models. Section 4 details the bivariate methodology while the focus here is on the single probit model that is applied to the micro data of all five Arab countries under consideration. The model takes the standard form:

$$\Pr(E^* = 1|X) = \Pr(\varepsilon > -H(X)\beta) \quad (1)$$

$$= 1 - \Phi(-H(X)\beta) \quad (2)$$

The function  $\Phi(\cdot)$  connotes the standard normal distribution and the error term  $\varepsilon$  is assumed to follow the normal distribution and therefore the model can be estimated using probit regression.

The dependent variable  $E^*$  connotes the enrollment status (1 = enrolled) of the person in school-going age. It can be thought of as the underlying demand for schooling and we only observe whether it exceeds the threshold zero. Persons in the age groups 6–22 are included in order to cover transition probabilities for each educational level. The arguments of  $H$  are the vector of family background variables, which are believed to affect child enrollment choices  $X$ , while  $\beta$  is a vector of estimated coefficients. Two groups of family background variables are included in order to test relevant hypotheses. The first pertains to child attributes such as age, gender and health condition. We examine enrollment variations according to these attributes and also test the impact of family size, family location in urban vs. rural areas and parents' education on the enrollment of chil-

<sup>1</sup> Author-computed using the index ( $L_i$ ) is:  $L_i = \sum p_{ij} \ln(p_{ij}/y_{ij})$  where  $p_{ij}$  and  $y_{ij}$  are, respectively, shares of the level  $j$  in school-age population and enrollment in country  $i$ . Zero is the lower bound but the upper bound of the index is not unity (Ram, 1995).

dren. The second group of variables covers economic indicators such as poverty status; i.e. whether the household is poor or not, and economic shocks that result from joblessness; i.e. when working members of the household lose their jobs and become unemployed. We test the hypothesis that idiosyncratic household income shocks, measured by the total number of unemployed in the household, adversely affect child enrollment because they push households to withdraw children from schools and let them work instead.

## 2.2. Data and variable description

The paper utilizes a variety of official micro-level data sets that encompass four samples of population censuses, a demographic survey, a multi-purpose household survey and a poverty survey. For Yemen, Oman and Kuwait, the paper accesses large samples that are drawn from their population censuses as well as Yemen's poverty survey. Yemen's sample is randomly drawn from its 1994 population census and represents 2% of all enumerated individuals. The census collected data on individual characteristics such as age, sex, health and education as well as the enrollment status of individuals in school-going age. It also collected information on the employment status (employed/unemployed) of household members residing inside or outside the country. In 1999, Yemen implemented a multi-dimensional poverty survey which provides additional valuable information on the various causes of school drop out. Covering 54,000 households that represent 2.5% of all households at the time, the survey collected information on enrollment, education, employment and migration status of household members, in addition to information on income and poverty status of households. Information was also gathered on the debt status of households and on whether the household had outstanding educational loans. Being the only data that availed such information, the poverty survey is used in Section 4 in order to jointly estimate the determinants of school enrollment and school drop out.

Oman's sample ratio is about 20% of the country's population during the 1993 census year. Collected information covered nationals and expatriates and indicated the age, gender, education and enrollment, health and employment status of household members. In the case of Kuwait, the paper utilizes two samples that are extracted from the 1980 and 1985 population censuses. Each sample represents 25% of the national and expatriate population and revealed information on such attributes as age, gender and employment of household members. The census samples of Yemen and Oman contain information on enrollments of individuals aged 6 years and above. However, Kuwait's census contains such information for individuals that are 10 years of age or older.

The West Bank and Gaza demographic survey, con-

ducted by the Palestinian Central Bureau of Statistics (PCBS) in 1995, collected information on enrollments starting at the age of six and on the education, health and gender of more than 100,000 individuals who are members of 15,000 households. In addition to family demographics and employment status of members, the survey provides information on the enrollment status and country of birth for children whose parents had lived abroad. For Jordan, the paper utilizes the 1987 Health, Nutrition, Manpower and Poverty survey that covered about 40,000 individual members of 5500 households. Besides information on the enrollment status of children, the Jordanian survey gleaned information on the education, gender and health characteristics and on the employment conditions of household members.

In interpreting the empirical results of this paper, we should note that in four of the five countries, education is compulsory through the primary level. In Oman, education is non-compulsory at all levels but public education is free from kindergarten up to the university level (Oman's National Report, 1996). In Kuwait, education is compulsory for 8 years from the age of 6–14 and all levels of education are free of charge. In Jordan, education is compulsory at the age 6 for 9 years. In the West Bank and Gaza, it is also compulsory for 10 years starting at the age of 6 and in Yemen, it is compulsory for 9 years at the age of 7 but due to financial constraints only 6 years of basic education is currently compulsory (World Bank, 2000). We should also note that the education system in Kuwait follows the 4/4/4 pattern while the other countries adopted the 6/3/3 pattern.

## 3. Empirical findings

Estimates derived from applying the single probit model, summarized in Tables 1 and 2, lead to the following messages. First, the marginal effects associated with age categories decline for older cohorts due to wastage, alternative competitive use of time for market engagement activities and, especially in the case of females, for home production activities. Second, gender disparities in enrollment are gleaned especially in rural areas. In Yemen for instance, female primary enrollment rates are 75% in urban areas but only 32% in rural areas. The corresponding rates for Yemeni males are, respectively, 76% and 63%. Third, the presence of migrant workers in countries of destination produces positive effects on enrollments suggesting that "rent" from migration augments household resources and helps educating children. Results for Gaza and the West Bank also reveal that children born in one of the Gulf oil countries while parent(s) worked there are more likely to be schooled than other children, probably reflecting higher living standards and/or stronger valuation of education.

Fourth, school withdrawal is associated with poverty,

Table 1  
Marginal effects of the determinants of school enrollment

Variable	Jordan (1987)		Kuwait (1980/1985)		Oman (1993)		Yemen (1994)		West Bank & Gaza (1995)	
	M	F	M	F	M	F	M	F	M	F
Age 6	1.209 0.0290	1.094 0.0259	–	–	0.7124 0.0055	0.872 0.0046	0.2410 0.0073	0.1076 0.0098	0.7450 0.0139	0.7746 0.0133
Age 7	1.390 0.0409	1.284 0.0398	–	–	1.114 0.0092	1.381 0.0086	0.5142 0.0070	0.3126 0.0088	1.306 0.0243	1.296 0.0248
Age 8	1.448 0.0460	1.252 0.0366	–	–	1.269 0.0128	1.532 0.0108	0.6287 0.0069	0.3779 0.0085	1.398 0.0302	1.379 0.0311
Age 9	1.583 0.0671	1.273 0.0388	–	–	1.324 0.0149	1.608 0.0122	0.7129 0.0078	0.4181 0.0093	1.379 0.0283	1.382 0.0314
Age 10	1.460 0.0466	1.416 0.0602	0.5634 0.0057	0.4945 0.0035	1.337 0.0154	1.589 0.0108	0.8251 0.0078	0.4238 0.0088	1.395 0.0296	1.377 0.0315
Age 11	1.555 0.0649	1.231 0.0374	0.5575 0.0035	0.5141 0.0054	1.315 0.0143	1.553 0.0114	0.8817 0.0099	0.4753 0.0104	1.319 0.0257	1.312 0.0266
Age 12	1.449 0.0472	1.172 0.0314	0.5388 0.0045	0.5251 0.0042	1.286 0.0132	1.266 0.0062	0.8568 0.0079	0.4353 0.0089	1.241 0.0222	1.214 0.0218
Age 13	1.314 0.0361	1.106 0.0283	0.5181 0.0035	0.5067 0.0057	1.279 0.0135	1.491 0.0099	0.8600 0.0092	0.4349 0.0098	1.099 0.0190	1.119 0.0190
Age 14	1.181 0.0286	1.053 0.0255	0.5062 0.0045	0.4946 0.0087	1.214 0.0119	1.411 0.0085	0.8435 0.0098	0.4114 0.0100	1.029 0.0174	1.045 0.0174
Age 15	1.053 0.0242	0.9272 0.0213	0.4982 0.0061	0.4816 0.0023	1.149 0.0105	1.336 0.0077	0.7508 0.0087	0.3526 0.0096	0.9444 0.0159	0.9293 0.0156
Age 16	0.9416 0.0222	0.8476 0.0197	0.4711 0.0059	0.4594 0.0052	1.033 0.0086	1.225 0.0074	0.7189 0.0107	0.3422 0.0112	0.8198 0.0154	0.7933 0.0147
Age 17	0.7691 0.0207	0.7412 0.0191	0.4528 0.0058	0.4264 0.0074	0.9358 0.0073	1.183 0.0065	0.6482 0.0116	0.3405 0.0119	0.7361 0.0152	0.7024 0.0144
Age 18	0.5976 0.0211	0.6335 0.0187	0.4344 0.0067	0.4211 0.0058	0.6962 0.0052	0.8958 0.0046	0.5549 0.0097	0.2576 0.0106	0.5692 0.0150	0.5449 0.0149
Age 19	0.5041 0.0223	0.5818 0.0199	0.3979 0.0054	0.2702 0.0083	0.6505 0.0053	0.8188 0.0049	0.4887 0.0138	0.2755 0.0152	0.4532 0.0163	0.4559 0.0166
Age 20	0.3991 0.0240	0.4311 0.0216	0.4036 0.0059	0.1059 0.0053	0.5548 0.0051	0.5203 0.0062	0.3107 0.0087	0.1509 0.0106	0.3575 0.0179	0.4093 0.0177
Age 21	0.3129 0.0266	0.3676 0.0248	0.3705 0.0077	0.1575 0.0051	0.4601 0.0048	0.5724 0.0084	0.3002 0.0157	0.2049 0.0183	0.3026 0.0192	0.3275 0.0193
Age 22	0.3087 0.0275	0.2378 0.0303	0.3669 0.0049	0.1233 0.0069	0.4655 0.0054	0.4446 0.0093	0.2001 0.0119	0.1556 0.0151	0.2768 0.0209	0.2731 0.0225

(continued on next page)

which underlines the necessity of controlling for income in empirical work (Basu & Van, 1998). The findings also validate the hypothesis that households facing economic shocks due to layoff of their working members are more likely to withdraw their kids from schools as revealed by the negative sign of the variable capturing the impact of the total number of unemployed persons in the household. While unemployment of breadwinners pushes Arab kids out of school, the severity of the push effect appears strongest in Yemen. It is noteworthy, however, that in the case of West Bank and Gaza, the influence of unemployment is somewhat smaller suggesting that political imperatives condition the demand for education in the

territories. That is, Palestinian strikes and Israeli closures are major causes of school discontinuity while domestic economic conditions play a relatively smaller role in the decision of Palestinian kids to leave schools (World Bank, 2002).

Since marginal effects can be difficult to interpret, Table 3 reports the actual and expected enrollment probabilities by age and educational levels. For each specific age, these probabilities, evaluated at the means of the variables included in the regression, are computed by setting all other age dummy variables equal to zero. With the exception of Kuwait, the probabilities decline with age (14 years+) in all countries and the decline is steeper

Table 1 (continued)

Variable	Jordan (1987)		Kuwait (1980/1985)		Oman (1993)		Yemen (1994)		West Bank & Gaza (1995)	
	Coefficient standard error									
	M	F	M	F	M	F	M	F	M	F
Father's education	0.0247	0.0261	0.0485	0.0511	0.024	0.0568	0.0949	0.0545	0.0143	0.0098
Mother's education	0.0036	0.0033	0.0012	0.0019	0.0006	0.0007	0.0017	0.0014	0.0009	0.0009
Urban = 1	0.0078	0.0045	0.0325	0.0876	0.0030	-0.006	0.0148	0.1405	0.0052	0.0113
T. Unem	0.0046	0.0042	0.0016	0.0026	0.0008	0.0010	0.0031	0.0040	0.0010	0.0010
Poor = 1	-	-	-	-	0.053	0.196	0.1232	0.3591	0.0195	0.018
Disable = 1	-0.060	-0.0263	-0.0395	-0.0214	-0.015	-0.013	-0.065	-0.010	-0.0254	-0.0157
Migrant = 1	0.0093	0.0086	0.00284	0.00516	0.0004	0.0005	0.0024	0.0034	0.0041	0.0044
Family size	-0.057	-0.071	-	-	-	-	-0.106	-0.071	-	-
Head sex = 1	0.0129	0.0213	-	-	-	-	0.0262	0.0099	-	-
Cen85 = 1	-0.650	-0.457	-	-	-0.171	-0.118	-0.447	-218	-0.173	-0.149
Gulf = 1	0.0103	0.0224	-	-	0.0083	0.0068	0.0391	0.0488	0.0064	0.0598
Constant	0.021	0.015	-	-	-	-	0.183	0.006	0.015	0.013
N	0.011	0.1324	-	-	-	-	0.0391	0.0153	0.0021	0.0144
Log likelihood	-0.002	-0.0043	-	-	-0.0009	-0.001	-0.002	-0.006	-0.001	-0.0004
	0.0019	0.0017	-	-	0.0001	0.0001	0.0004	0.0005	0.0010	0.0010
	0.166	0.1459	0.049	0.084	0.2390	0.019	0.136	0.1515	0.0695	0.089
	0.0248	0.0224	0.0064	0.0117	0.0053	0.0067	0.0075	0.0073	0.0196	0.0182
	-	-	0.1058	0.2341	-	-	-	-	-	-
	-	-	0.0031	0.0051	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	0.1011	0.0751
	-0.903	-0.8567	-1.649	-1.842	-0.545	-0.4546	-0.156	-0.789	-0.9253	-0.948
	0.0409	0.0362	0.01480	0.0157	0.0089	0.0091	0.0112	0.0119	0.0287	0.0271
	20356	19189	130356	49484	403793	366962	68292	65486	39564	37780
	-4245	-3601	-44462	-21155	-41397	-52404	-32680	-32330	-10408	-7895

for female, relative to male, students. However, enrollment rates for Kuwaiti men and women aged 20–22 remain high because of the country's "welfare culture" that includes free and subsidized education up to the postgraduate level. In addition, Kuwaiti graduates receive high salaries and excellent fringe benefits including the option for early retirement, after 25 and 15 years of service for men and women, respectively, at high pensions that replace 65–95% of the worker's last salary (El-Qaisi, 2001).

Fifth, enrollment opportunities of physically and/or mentally impaired children are slim. In Oman for instance, the average expected enrollment probabilities for all educational levels are 0.15 and 0.39 for disabled females and males, respectively. The corresponding probabilities for healthy individuals are 0.45 and 0.74, respectively (data not shown). Sixth, noteworthy too are the positive estimates of the coefficient of the years of schooling that parents acquired. They indicate that edu-

cated mothers and fathers are more likely to send their children to schools than less educated ones. Seventh, households headed by women are less likely to school their children because they tend to experience unfavorable socioeconomic conditions following marital disruption or the death of husbands. Moreover, there appears to be a trade-off between the number of children and enrollment. For each country, the estimate of the family size variable is negative and significant, implying that children compete for parent's resources and that high fertility rates strain family resources. Empirical studies reviewed by Grootaert and Kanbur (1995) also indicate that a larger household size tends to be associated with fewer investments by parents in children's human capital through schooling and a higher probability of child work. Finally, Kuwait's data offer an opportunity to test the extent of time-dependent changes in enrollment probabilities by sex over the two-census periods 1980 and 1985. The dummy variable gauging the census year is

Table 2  
Means of variables used in the enrollments model

Variable	Jordan (1987)		Kuwait (1980/1985)		Oman (1993)		Yemen (1994)		West Bank & Gaza (1995)	
	M	F	M	F	M	F	M	F	M	F
Age 6	0.031	0.032	–	–	0.020	0.0336	0.0678	0.0674	0.0432	0.0406
Age 7	0.029	0.031	–	–	0.036	0.0316	0.0677	0.0676	0.0393	0.0393
Age 8	0.031	0.031	–	–	0.037	0.0359	0.0748	0.0739	0.0361	0.0373
Age 9	0.029	0.031	–	–	0.029	0.0396	0.0604	0.0552	0.0386	0.0363
Age 10	0.033	0.030	0.066	0.068	0.037	0.0336	0.0705	0.0662	0.0366	0.0345
Age 11	0.029	0.028	0.063	0.065	0.029	0.0293	0.0435	0.0400	0.0350	0.0356
Age 12	0.031	0.029	0.061	0.061	0.039	0.0304	0.0734	0.0626	0.0348	0.0346
Age 13	0.029	0.029	0.057	0.059	0.028	0.0448	0.0544	0.0470	0.0317	0.0328
Age 14	0.031	0.029	0.055	0.056	0.022	0.0319	0.0473	0.0446	0.0329	0.0312
Age 15	0.031	0.030	0.055	0.055	0.022	0.0309	0.0555	0.0519	0.0341	0.0300
Age 16	0.029	0.029	0.052	0.052	0.018	0.0186	0.0358	0.0343	0.0317	0.0283
Age 17	0.028	0.027	0.050	0.049	0.021	0.0290	0.0298	0.0291	0.0307	0.0283
Age 18	0.026	0.026	0.050	0.049	0.022	0.0373	0.0418	0.0432	0.0317	0.0277
Age 19	0.025	0.023	0.044	0.045	0.019	0.0276	0.0209	0.0177	0.0289	0.0247
Age 20	0.024	0.023	0.058	0.053	0.020	0.0205	0.0469	0.0529	0.0266	0.0237
Age 21	0.023	0.020	0.046	0.045	0.031	0.0091	0.0159	0.0129	0.0252	0.0244
Age 22	0.022	0.019	0.058	0.048	0.017	0.0133	0.0248	0.0212	0.0229	0.0215
Cen85 = 1	–	–	0.5664	0.5422	–	–	–	–	–	–
Head sex = 1	0.948	0.929	0.9404	0.9329	0.951	0.5227	0.9127	0.8867	0.9672	0.9456
Father's education	4.43	4.38	2.397	2.551	1.97	1.84	1.862	1.799	5.571	5.464
Mother's education	3.2	2.68	1.735	1.944	2.12	1.81	1.161	1.159	4.864	4.813
Urban = 1	–	–	–	–	0.362	0.3636	0.1684	0.1615	0.391	0.390
T. Unem	0.268	0.246	0.067	0.059	0.174	0.169	0.2459	0.1911	0.669	0.597
H. Size	8.64	8.643	–	–	8.81	8.79	8.871	8.863	9.231	9.061
Disable = 1	0.026	0.020	–	–	0.027	0.028	0.031	0.029	0.035	0.0281
Poor = 1	0.193	0.196	–	–	–	–	0.197	0.184	–	–
Gulf = 1	–	–	–	–	–	–	–	–	0.0174	0.0198

positive and stronger in the female regression implying that, over time, the gender imbalance is redressing. The argument is buttressed by the finding that the largest gain in female enrollments occurred for females 18 years of age, which is the mean age at marriage during the mid-1980s.

#### 4. Causes of education wastage

In order to better understand the causes of lagging school enrollments, I analyze the forces that induce individuals to drop out using Yemen's 1999 poverty survey. The survey gathered information on individuals who were enrolled in 1998/99 and on individuals who were enrolled previously but subsequently dropped out and also gleaned information on individuals who were never enrolled. The distribution of female cohorts aged 6–22 across these three categories were as follows: 32% currently enrolled, 13% previously enrolled and 55% never enrolled. The corresponding percentages in the case of

male cohorts were: 63, 16 and 22, respectively. For persons who were previously (but no longer) enrolled, the survey collected additional information about causes of schooling discontinuity. Besides, the survey collected information on whether households have outstanding educational loans and we utilize this information in order to assess the impact of credit availability on schooling decisions. Two variables indicating the position of each household on the income distribution and the extent of its financial indebtedness are included as well in order to capture the impact of resources on enrollment decisions.

Methodologically, this section employs single probit and simultaneous bivariate probit models in order to estimate the determinants of enrollment in (and leakage from) schools. The bivariate model jointly estimates the parameters of two dichotomous equations: one for individuals who were "currently enrolled in 1998/99" while the second is for cohorts who were "previously enrolled but dropped out" subsequently. Because of the potentially high covariance between the disturbance terms of the two probit equations, the seemingly unrelated probit



Table 3  
School enrollments: actual (A) and predicted (P) probabilities

Variable		Jordan (1987)		Kuwait (1980/1985)		Oman (1993)		Yemen (1994)		West Bank and Gaza (1995)	
		M	F	M	F	M	F	M	F	M	F
Age 6	A	0.921	0.909	–	–	0.498	0.453	0.292	0.171	0.621	0.624
	P	0.905	0.889	–	–	0.485	0.432	0.291	0.161	0.620	0.580
Age 7	A	0.969	0.972	–	–	0.904	0.889	0.557	0.342	0.961	0.968
	P	0.942	0.957	–	–	0.886	0.854	0.552	0.310	0.976	0.946
Age 8	A	0.978	0.968	–	–	0.960	0.933	0.660	0.388	0.976	0.983
	P	0.966	0.952	–	–	0.946	0.904	0.671	0.337	0.980	0.982
Age 9	A	0.990	0.972	–	–	0.980	0.947	0.736	0.426	0.977	0.983
	P	0.988	0.969	–	–	0.970	0.925	0.678	0.409	0.958	0.989
Age 10	A	0.978	0.991	0.960	0.906	0.975	0.942	0.805	0.427	0.977	0.983
	P	0.975	0.977	0.947	0.909	0.965	0.916	0.783	0.376	0.975	0.964
Age 11	A	0.992	0.964	0.944	0.920	0.974	0.951	0.851	0.501	0.964	0.971
	P	0.977	0.938	0.966	0.915	0.964	0.934	0.846	0.475	0.958	0.978
Age 12	A	0.978	0.948	0.948	0.901	0.973	0.923	0.832	0.402	0.943	0.943
	P	0.962	0.926	0.956	0.909	0.962	0.893	0.827	0.428	0.939	0.953
Age 13	A	0.958	0.923	0.941	0.903	0.969	0.923	0.831	0.393	0.887	0.907
	P	0.983	0.948	0.978	0.901	0.957	0.901	0.806	0.388	0.922	0.936
Age 14	A	0.916	0.892	0.941	0.894	0.959	0.897	0.817	0.351	0.845	0.860
	P	0.979	0.958	0.956	0.889	0.943	0.871	0.719	0.331	0.889	0.888
Age 15	A	0.845	0.797	0.916	0.882	0.929	0.839	0.745	0.266	0.782	0.762
	P	0.985	0.959	0.925	0.876	0.906	0.811	0.689	0.255	0.848	0.795
Age 16	A	0.762	0.716	0.912	0.867	0.877	0.822	0.720	0.242	0.672	0.627
	P	0.976	0.921	0.917	0.878	0.858	0.796	0.696	0.236	0.676	0.766
Age 17	A	0.602	0.595	0.878	0.834	0.792	0.699	0.663	0.230	0.579	0.510
	P	0.689	0.566	0.869	0.855	0.807	0.674	0.624	0.187	0.589	0.594
Age 18	A	0.409	0.449	0.861	0.796	0.576	0.512	0.575	0.137	0.405	0.327
	P	0.436	0.447	0.859	0.808	0.603	0.492	0.523	0.156	0.446	0.483
Age 19	A	0.321	0.389	0.791	0.736	0.429	0.359	0.525	0.164	0.291	0.231
	P	0.374	0.319	0.768	0.744	0.459	0.349	0.486	0.077	0.234	0.298
Age 20	A	0.221	0.211	0.743	0.642	0.197	0.169	0.348	0.086	0.208	0.181
	P	0.265	0.259	0.710	0.669	0.207	0.158	0.269	0.069	0.216	0.197
Age 21	A	0.159	0.152	0.664	0.591	0.131	0.145	0.271	0.103	0.163	0.118
	P	0.204	0.196	0.689	0.645	0.143	0.141	0.238	0.057	0.177	0.109
Age 22	A	0.153	0.075	0.601	0.554	0.132	0.135	0.201	0.076	0.138	0.079
	P	0.196	0.179	0.639	0.579	0.139	0.129	0.214	0.048	0.156	0.089
Enrollment by level of education											
Primary	A	0.971	0.962	–	–	0.941	0.906	0.659	0.401	0.902	0.914
	P	0.969	0.958	–	–	0.921	0.876	0.628	0.348	0.978	0.981
Intermediate	A	0.924	0.889	0.946	0.910	0.984	0.936	0.868	0.362	0.868	0.872
	P	0.916	0.878	0.952	0.894	0.976	0.914	0.857	0.423	0.917	0.885
Secondary	A	0.596	0.582	0.884	0.839	0.748	0.737	0.653	0.401	0.552	0.489
	P	0.579	0.578	0.897	0.851	0.811	0.644	0.795	0.352	0.650	0.399
University	A	0.217	0.213	0.687	0.634	0.330	0.251	0.215	0.093	0.204	0.154
	P	0.195	0.206	0.693	0.616	0.339	0.253	0.294	0.217	0.305	0.114

methodology is applied here. The model takes the following form (Greene, 2000):

$$E^* = \beta'_1 x_1 + D^* + \varepsilon_1, \quad E_1 = 1 \quad \text{if } E_1^* > 0, \quad 0 \text{ otherwise,} \quad (3)$$

$$D^* = \beta'_2 x_2 + \varepsilon_2, \quad D_2 = 1 \quad \text{if } D_2^* > 0, \quad 0 \text{ otherwise,} \quad (4)$$

$$E[\varepsilon_1] = E[\varepsilon_2] = 0, \quad (5)$$

$$\text{Var}[\varepsilon_1] = \text{Var}[\varepsilon_2] = 1, \quad (6)$$

$$\text{Cov}[\varepsilon_1, \varepsilon_2] = \rho, \quad (7)$$

where  $E^*$  and  $D^*$  connote, respectively “current enrollment” and “drop out” of previously enrolled. The vector of error terms  $[\varepsilon_1, \varepsilon_2]$  is assumed to have a bivariate normal distribution with zero means and correlation coefficient  $\rho$  which connotes the covariance between the error terms of the two equations. The binary enrollment decision depends on the vector  $x_1$  that includes household exposure to negative economic shocks, credit availability, gender of household head, parents’ education, urban/rural location, and the position on the income distribution of households (poorest quintile, second quintile, third, fourth and top quintiles). In addition to those variables, the vector  $x_2$  in Eq. (4) includes the following factors that induce schooling discontinuity: (1) Withdrawal due to completion of the current education level; (2) Unavailability of schools or teachers; (3) Lack of transportation; (4) Drop out to marry and start a new family; (5) Need to generate income and support family; (6) High costs of school retention; (7) Unwillingness to school daughters; and (8) The high costs of schooling.

I lump age categories into groups to correspond to schooling levels; thus, the variable, “age 6–11”, corresponds to the elementary education level and “age 12–14” corresponds to the primary level and so on. The benchmark is the group “age 16–18” which corresponds to the secondary level of education. The dependent variable  $D^*$  of Eq. (4) appears on the right-hand-side of Eq. (3) and thus the model is a recursive simultaneous equation model. The endogenous nature of variables on the right-hand-side could be ignored because we are maximizing the log likelihood. The model allows for the direct transmission of the influence of variables as well as the indirect transmission of variables in Eq. (4) (Greene, 2000).

Bivariate and single equation estimates, summarized in Tables 4 and 5, lead to the points following. First, while redressing relative to the 1994 gender pattern, disparity remains a significant feature of Yemen’s education system—last two columns of Table 5. For children in the age group 6–11, the enrollment probability is markedly lower for females (0.40) than males (0.63). For cohorts in the age bracket 12–18, the corresponding probabilities are (0.33) and (0.72) and for cohorts, in the age group 19–22, the respective probabilities are (0.10) and (0.32). Third, although larger in size, these probabilities generally track the pattern of the 1994 sample.

The findings also suggest that households’ income position has a powerful effect on children’s schooling as judged by the size of the coefficients connoting income strata. Enrollment gaps across income groups, shown in Fig. 1, are constructed by sorting the sample into 10 income deciles ranging from poorest to richest, and computing the expected enrollment probabilities. Clearly, the

rural–urban dichotomy is marked and the gender gap is smaller than the income gap.

Our findings support the argument that economic shocks that households encounter pressure students to discontinue their schooling, especially when credit that is needed to finance education is simply not available. The sign of the variable connoting student loan is positive and therefore our findings agree with the hypothesis put forward by Jacoby and Skoufias (1997) that credit availability allows households to borrow on the market whenever they face a downturn in income, repaying when income went up again. Hence, when credit is available, children’s school attendance would not be subject to the vagaries of parental income.

The discussion in the remainder of this section focuses on the causes of schooling discontinuity as expressed by the parameter estimates from Eq. (4), shown in Table 5. The findings strongly indicate that supply factors, unavailability of schools and/or teachers, are powerful determinants of school wastage. Similarly, students that trek a considerable distance to be part of the schooling process tend to drop out because long distance and travel time increase the cost of schooling. However, relative to male students, females encountering difficulty in accessing schools are more likely to withdraw from the system. Other countries experiences suggest that when the demand for girl’s education is low, families will not send their daughters to school, even if one is available (Filmer, 1999). Safety issues relate to traveling to schools that are sometimes several kilometers away from the village are significant in the decision not to send girls to schools. Drop out rates in the case of adolescent girls are high for marriage and chastity reasons. Specifically, while education is a valued attribute, so is young age at marriage for girls. Perceived risks are also associated with sexual safety as school retention may increase the risk of compromising sexual virtue and lead to diminished prospects for marriage.

Finally, the negative sign of the dependent variable  $D^*$  in Eq. (4), which also appears in Eq. (3), agrees with the expectation that current enrollment is adversely affected by schooling discontinuity of previously enrolled kids. The correlation between the disturbances in the equations, the omitted variables, is high indicating that estimating the two equations simultaneously improves the efficiency of the derived parameters. The Wald statistic for the test of the hypothesis that  $\rho$  equals zero is larger than the tabulated value and the hypothesis is rejected.

## 5. Summary and conclusions

Research conducted here identified the impact of family background variables on schooling in Arab countries. Enrollment rates are influenced by the position of house-



Table 4  
Bivariate and single probit models of enrollments and schooling discontinuity, Yemen 1999

Variable/equation	M		F	
	Coefficient	standard error	Coefficient	standard error
Eq. (3): current enrollment	Bivariate probit model		Single probit	
Age 6	0.8102	0.0069	1.039	0.0333
Age 7	1.639	0.0063	1.721	0.0309
Age 8	2.144	0.0065	2.019	0.0304
Age 9	2.469	0.0075	2.209	0.0330
Age 10	2.817	0.0081	2.357	0.0358
Age 11	2.961	0.0092	2.384	0.0388
Age 12	2.993	0.0079	2.327	0.0331
Age 13	2.995	0.0083	2.253	0.0334
Age 14	2.969	0.0085	2.079	0.0329
Age 15	2.797	0.0082	1.937	0.0314
Age 16	2.891	0.0091	1.742	0.0353
Age 17	2.829	0.0101	1.677	0.0383
Age 18	2.628	0.0089	1.351	0.0359
Age 19	2.899	0.0108	1.655	0.0397
Age 20	2.534	0.0089	1.383	0.0351
Age 21	2.616	0.0136	1.432	0.0488
Age 22	2.477	0.0122	1.294	0.0442
Father's education	0.0391	0.0006	0.0079	0.0023
Mother's education	0.0525	0.0013	0.0948	0.0044
Total unemployed members	-0.1658	0.00221	-0.023	0.0093
Household size	-0.0154	0.00031	-0.007	0.0014
Urban = 1	0.4586	0.0034	1.093	0.0139
Debt size	-0.1936	0.0399	-0.0453	0.1845
Migrant abroad = 1	0.5702	0.0862	0.165	0.3305
Poor household = 1	-0.167	0.0605	-0.378	0.2570

(continued on next page)

Table 4 (continued)

Variable/equation	M		F	
	Coefficient	standard error	Coefficient	standard error
Eq. (3): current enrollment	Bivariate probit model		Single probit	
Income: second 20%	0.1023 0.0045	0.0784 0.0195	0.0172 0.0047	0.0043 0.0016
Income: third 20%	0.2381 0.0044	0.2545 0.0187	0.0473 0.0047	0.0146 0.0015
Income: fourth 20%	0.2660 0.0045	0.2329 0.0191	0.0597 0.0048	0.0144 0.0015
Income: top 20%	0.3244 0.0044	0.3009 0.0189	0.0735 0.0047	0.0187 0.0015
Head sex = 1 (male)	0.1912 0.0063	0.2754 0.0225	0.0542 0.0064	0.0201 0.0019
Education loan = 1	0.4078 0.0913	0.1266 0.3675	0.1050 0.0939	0.0106 0.0292
Previously enrolled ( <i>D*</i> )	-11.05 0.0805	-9.489 0.0795	-	-
Eq. (4): drop out of previously enrolled				
Age groups 6–11	-1.473 0.0063	-0.455 0.0263	-0.07079 0.004555	-0.04859 0.00067
Age group 12–15	-0.3592 0.0041	-0.5393 0.0178	-0.00169 0.00078	-0.02017 0.00032
Age groups 19–22	0.9549 0.0031	0.6218 0.0141	0.03307 0.00219	0.02911 0.00043
Urban = 1	0.2925 0.0025	0.6451 0.0122	0.00849 0.00069	0.02710 0.00038
Debt size	0.1585 0.0346	0.2091 0.1998	0.00315 0.00057	-0.0113 0.00235
Total unemployed members	0.0817 0.0016	0.0114 0.0085	0.0077 0.0025	0.0061 0.0010
Poor = 1	0.4017 0.0462	0.4963 0.1165	0.0093 0.0009	0.02865 0.00381
Head sex = 1	-0.0019 0.0059	-0.119 0.0199	-0.0108 0.00130	-0.00401 0.00258
Migrant = 1	-0.7414 0.0891	-0.455 0.2856	-0.0153 0.00464	0.003670 0.003161
Household size	0.0014 0.0002	0.0092 0.0042	0.00067 0.00008	-0.00058 0.000017
Income: second 20%	-0.0108 0.0389	-0.0454 0.0192	-0.04194 0.03004	-0.002441 0.000235
Income: third 20%	-0.0640 0.0037	-0.0271 0.0181	-0.00923 0.00135	-0.009582 0.000254
Income: fourth 20%	-0.0291 0.0038	-0.0158 0.00187	-0.00864 0.00137	-0.007945 0.000252
Income: top 20%	-0.0186 0.00975	-0.0206 0.0185	-0.00810 0.00135	-0.010997 0.000265
School unavailable = 1	1.1482 0.0038	1.1783 0.0197	0.99011 0.00110	0.213684 0.001956
Distance = 1	1.475 0.0088	1.654 0.0432	0.50052 0.01318	0.601035 0.000533
Dropped to marry = 1	1.751 0.0091	2.265 0.0302	0.9271 0.00342	0.848096 0.001165
Dropped to work = 1	1.502 0.0036	1.215 0.0265	0.92372 0.00535	0.189464 0.001632

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Table 4 (continued)

Variable/equation	M	F	M	F
	Coefficient		standard error	
Eq. (3): current enrollment	Bivariate probit model		Single probit	
High cost = 1	1.398	1.284	0.89168	0.141270
	0.0050	0.0206	0.00775	0.001013
Unwilling to educate children = 1	0.7280	0.8336	0.84751	0.131845
	0.0175	0.0179	0.01885	0.000882
Lack of teachers = 1	0.4272	1.157	0.72978	0.109017
	0.0089	0.0398	0.01854	0.000607
Other reasons = 1	1.215	1.466	0.87348	0.126085
	0.0044	0.0201	0.00786	0.000889
Constant	1.733	1.172	– 16578	–0.19436
	0.0547	0.2833	0.00225	0.001669
Sample size	80396	103095	80396	103095
Covariance ( $\rho$ )	0.815	0.649	–	–
Wald test of $\rho = 0$	42818.5	22868.3	–	–
Log likelihood	–43854.3	–42741.4	–22409.6	–22520.1

holds on the income scale. Poor households are less likely to school their children relative to households that are at the top 20% of the income distribution. Economic shocks adversely affect households' decisions to keep children schooled. That is, unemployment of breadwinners pushes kids out of school; the severity of the push effect appears strongest in Yemen. Given that Arab economies have been experiencing double-digit unemployment rates, and since unemployment and poverty are inter-dependent in Arab economies (Al-Qudsi, 2002); the policy implications of the negative causality exerted by unemployment on enrollments should rank high on the agenda of policy makers. Availability of student loans has a positive impact on the retention of children in schools, but most of the borrowing is done outside the formal financial system. Families borrow from relatives, from the curb market or from employers of breadwinners (CSO, 2001). Making formal credit accessible and affordable to the poor and middle class may be an effective way of achieving not only higher enrollment rates but also better quality education.

The research also corroborated that parents' education contributes positively to school enrollment and retention of their children. The interaction between parents' education and incomes of households has profound policy implications. That is, in any generation, children who do not go to school do not acquire the skills needed to earn decent wages as adults. Upon becoming parents themselves, they do not send their children to school and another generation misses out on education, and in its own turn, sends its children to work. This sets off a leg-

acy of school discontinuity, low earnings and poverty down through the generations.

While bias against female enrollment is redressing over time, enrollment probabilities of physically and mentally disadvantaged individuals remain slim. Clearly, the education infrastructure of Arab countries is not coping adequately with the costly equipment and credentials that are critical requisites for educating the handicapped. Our findings also reveal that supply factors, unavailability of schools and/or teachers, are powerful determinants of school wastage. Students who trek a considerable distance to be part of the schooling process tend to drop out because long distance and travel time increase the cost of schooling. Accordingly, policy makers should push ahead with efforts to supply requisite schools and teachers and to educate the people especially since Islamic traditions recognize the importance of education for the young and old and for boys and girls alike (El-Kogali, 1998). Attention should also be given to the problem of child labor whose magnitude is especially large in Yemen, 14% of children aged 11–15, and in the West Bank and Gaza, 8%. Policies that strictly ban child labor are not likely to work. Instead, a gradual approach that allows children to combine school attendance with some paid work might be preferable to a strict ban on child labor. Companion policies that liberalize trade and attract private investments and improve the efficiency of labor markets must be introduced as well. These policies promote economic growth and increase the prospective rewards of education and, thereby, expand school enrollment and shrink school drop out rates (Hoekman & Messerlin, 2002).

Table 5  
Descriptive statistics and enrollment probabilities: Yemen 1999

Variable	Descriptive statistics		Actual and predicted enrollments			
	Variable means		M		F	
	M	F	Actual	Predicted	Actual	Predicted
Age 6	0.0355	0.0348	0.295	0.298	0.128	0.156
Age 7	0.0369	0.0341	0.579	0.572	0.326	0.367
Age 8	0.0372	0.0364	0.687	0.690	0.436	0.466
Age 9	0.0311	0.0299	0.787	0.800	0.498	0.556
Age 10	0.0402	0.0382	0.817	0.827	0.508	0.559
Age 11	0.0268	0.0230	0.859	0.869	0.528	0.619
Age 12	0.0388	0.0342	0.835	0.840	0.459	0.522
Age 13	0.0327	0.0290	0.835	0.844	0.431	0.488
Age 14	0.0298	0.0278	0.839	0.811	0.361	0.413
Age 15	0.0310	0.0318	0.807	0.792	0.292	0.343
Age 16	0.0259	0.0268	0.779	0.772	0.271	0.327
Age 17	0.0213	0.0222	0.658	0.694	0.261	0.306
Age 18	0.0303	0.0299	0.517	0.551	0.171	0.184
Age 19	0.0187	0.0186	0.529	0.489	0.164	0.183
Age 20	0.0281	0.0305	0.329	0.392	0.103	0.121
Age 21	0.0122	0.0119	0.308	0.341	0.085	0.103
Age 22	0.0171	0.0177	0.228	0.243	0.074	0.092
Enrollment by education level						
Primary	–	–	0.630	0.641	0.396	0.442
Intermediate	–	–	0.792	0.801	0.389	0.432
Secondary	–	–	0.567	0.552	0.209	0.228
University	–	–	0.324	0.306	0.104	0.117
Father's education	1.917	1.879				
Mother's education	1.319	1.327				
Member is migrant = 1	0.038	0.034				
Household size	9.813	9.792				
Income: second 20%	0.1941	0.1912				
Income: third 20%	0.2114	0.2078				
Income: fourth 20%	0.1900	0.1909				
Income: top 20%	0.1989	0.2016				
Urban	0.3219	0.3188				
Debt size	0.032	0.019				
Previously enrolled	0.2128	0.108				
Total unemployed members	0.2978	0.2585				
Poor household	0.293	0.278				
Head sex = 1 (male)	0.9447	0.9103				
Education loan	0.0469	0.0354				
Age 6–11	0.2082	0.1968				
Age 12–15	0.1313	0.1225				
Age 19–22	0.0757	0.0779				
School unavailable	0.1930	0.02288				
Distance	0.2091	0.1925				
Dropped to marry	0.1905	0.0106				
Dropped to work	0.2029	0.0234				
Unwilling to school kids	0.0716	0.0358				
High cost of education	0.1516	0.0828				
Lack of teachers	0.0134	0.2051				
Other reasons	0.0133	0.0187				

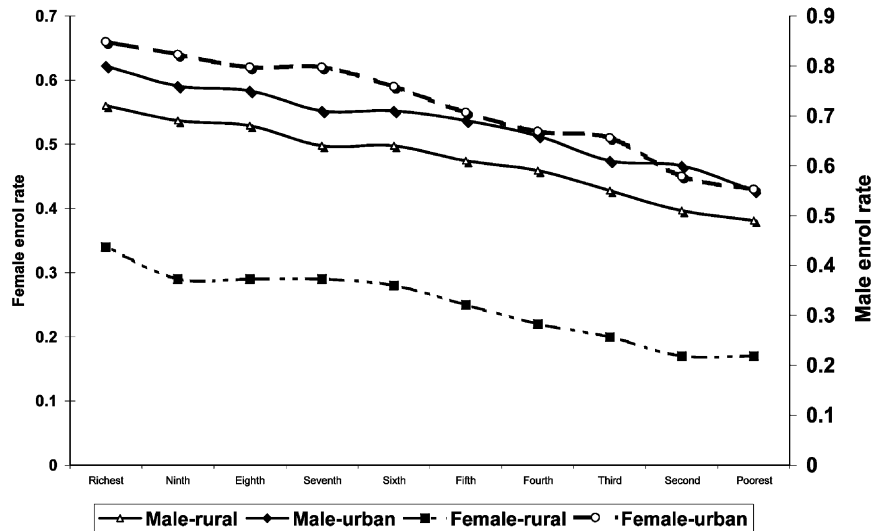


Fig. 1. Enrollment by gender and income groups, Yemen 1999.

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## References

- AL-Qudsi, S. S. (2002). Modalities of social safety nets and the triangle of growth, poverty and distribution in the Arab economy. *Journal of Development and Economic Policies, API 4*(2), 9–77 (in Arabic).
- Assaad, R., Levison, D., & Zibani, N. (2000). *Child work and schooling in Egypt*. University of Minnesota, memo.
- Basu, K., & Van, P. H. (1998). The economics of child labor: comment. *American Economic Review, 88*, 412–427.
- Central Statistical Office (2001). *Yemen's poverty survey*. Sana'a, Yemen.
- Dehejia, R., & Gatti, R. (2002). *Child labor: The role of income volatility and access to credit in a cross section of countries*. Washington, DC: World Bank.
- Economic and Social Commission for Western Asia (2000). *Survey of economic and social conditions in the EDCWA region 1999–2000*. U.N. E/ESCWA/ED/2000/2.
- El-Qaisi, E. (2001). Economic rent of public-sector workers. *Journal of Social Sciences, 49*(4), 43–61.
- Filmer, D. (1999). The structure of social disparities in education: gender and wealth. *World Bank policy research paper on gender and development*, No. 5. Washington, DC.
- Gomes-Neto, J. B., & Hanushek, E. (1994). The causes and consequences of grade repetition: evidence from Brazil. *Economic Development and Cultural Change, 43*(1), 117–148.
- Greene, W. H. (2000). *Econometric analysis*. (4th ed.). New Jersey: Prentice-Hall.
- Grootaert, C., & Kanbur, R. (1995). Child labor: an economic perspective. *International Labor Review, 134*(2), 185–203.
- Hoekman, B., & Messerlin, P. (2002). *Harvesting trade for development and growth in the Middle East*. Washington, DC: Council on Foreign Relations.
- Jacoby, H., & Skoufias, E. (1997). Risk, financial matters, and human capital in developing countries. *Review of Economic Studies, 64*, 311–335.
- Khandker, S., Lavy, V., & Filmer, D. (1994). Schooling and cognitive achievements of children in Morocco. *World Bank discussion paper*, Washington, DC.
- Klinov, R. (1996). Changes in school enrollment patterns in Israel: a comparison between two disadvantaged groups. *Economics of Education Review, 15*, 289–301.
- El-Kogali, S. (1998). Obstacles to girls' education: Islam or economics? In Fifth Annual Conference held in Tunisia, August–September 1998, Cairo. *Economic Research Forum, Cairo*.
- Oman (1996). *National Report to the International Conference on Education*. Geneva.
- Patrinos, H., & Psacharopoulos, G. (1997). Family size, schooling and child labor in Peru: an empirical analysis. *Journal of Population Economics, 10*, 387–405.
- Psacharopoulos, G. (1997). Child labor versus educational attainment: some evidence from Latin America. *Journal of Population Economics, 10*(October), 337–386.
- Ram, R. (1995). Inter-country and intra-country inequalities in school enrollments: a broad international perspective. *Economics of Education Review, 272*, 363–372.
- Ravallion, M., & Wodon, Q. (1999). Does child labor displace schooling? Evidence on behavioral responses to an enrollment subsidy. *World Bank WPS 2116*, May 1999.
- Shafik, N. (1994). *Big spending, small returns: The paradox of*

- human resources development in the Middle East*. Washington, DC: World Bank.
- United Nations Educational, Scientific and Cultural Organization (1999). *Statistical yearbook*. Paris: UNESCO Publishing Press.
- United Nations Educational, Scientific and Cultural Organization (1995). *World education report*. Oxford.
- Wahba, J. (2000). Child schooling and child labor: evidence from Egypt. *Economic research forum*, Working Paper 9916, Cairo, Egypt.
- World Bank (2000). *Education in the Middle East and North Africa: A strategy towards learning for development*. Washington, DC.
- World Bank (2002). *Fifteen months: Intifada, closures and the Palestinian economic crisis: An assessment*. Washington, DC.