International perspectives on Gender, science and Development

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International perspective on Issues in Gender, Science and Economic Development*

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Abstract

The gender issues in science and economic development have two major dimensions: economic opportunities for women and abilities of women. The focus of this study is on economic opportunities for women from a global perspective. While there are significant increases in the female labor force participation rates in almost all countries, the proportion of female professional and technical workers remains much smaller. Using data from fifty countries with high human development index, we find that high index of achievement in education and high per capita incomes are important factors that contribute to the growth of professional and technical women workers. Gender empowerment index alone does not guarantee increased participation of women in science and technology.

Introduction:

The logical starting point of all studies on international perspectives on gender, science and development is the participation of women in the labor force and its distribution in different occupations and different sectors of economic activity. According to an ILO- UN (2001) study, labor force participation rates (LFPR) for women have been steadily rising. In many countries, these rates are between 60 to 80%, with a few exceptions in North Africa and Middle East. The gender and occupational distribution data for the US show that women have increased their representation in almost all occupations and industry since 1950 with their biggest gains in managerial and professional areas (Jacobsen, 2007). At the same time, the industry and occupational distribution shows that women are predominantly employed as typists, nurses, teachers, house helps, and hairdressers. These are typically low income and low skill and highly gender-based stereotypes. This is, in spite of the fact that there has been rapid increase among women than men in going on to post secondary education in several countries. Our study clearly shows that educational attainment will hold the key to bridging this occupational segregation in science and technology. We find strong evidence from the developed and industrialized economies that economic development of a country, as measured by its per capita income contributes positively and significantly to the proportion of women professional and technical workers.

2. Gender, Science and Occupational Segregation: Past and Present studies

Professor Summers' remarks at a NBER seminar (2005) rekindled international debate on the issue of under representation of women in science. The question of under representation of women in science, engineering and technology is intricately connected to the questions of occupational segregation by gender and its impact on the economy. Milkman (1988) examined the evolution of occupational segregation by gender in the context of labor-intensive industries like the electrical and automotive before and during the war. Anker (1998) provided comprehensive and detailed analysis of the occupational segregation by sex based on international comparisons of more than forty countries. Anker discovers that occupational segregation by sex is extensive in every country. He also discovers that there are more male-dominated occupations than female-dominated occupations. While, Scandinavia, a role model of gender equality had significant occupational segregation, export oriented countries in East Asia had lower incidence of such segregation. Professional occupations in science, engineering and management, are plagued with vertical segregation. His study finds that regional culture and not the socio economic factors have any influence on occupational segregation. On the contrary, our study clearly shows that education and public expenditure on education are between the two important factors in explaining the international data on women professionals and technical workers. Dolado, Felgueroso, and Francisco (2002) have studied occupational segregation across the Atlantic.

Blau, Ferber and Winkler (1996, 2006) and Jacobsen (1994, 2007), two widely used textbooks on gender economics, discuss the topics of occupational distribution of gender with special emphasis on occupational segregation by gender. There is sufficient evidence from domestic and international data that there are fewer women in science and engineering related professions. Oglobin (2002) studied occupational segregation in Russia and Haupt (2005) studied the issue of too few women engineers. Lane (1999) analyzed as to why there are fewer women in science. This study drew attention to the problems faced by women in Science and engineering professions, and the difficulties in their career progression. This lack of representation by women also meant loss of great economic potential. EU set up a science research commission in 1999, and set up a special group called the European Platform of Women Scientists (EPWS, 2003). One of the core tasks of the EPWS is the representation of the interests, needs, concerns and aspirations of women scientists in the research policy debate on the European level. EPWS seeks to influence the decision-making process regarding European research policy through negotiation of interests with decision-makers and other stakeholders. It is when the stakeholders are also the decisions makers; we expect fundamental changes in the society and its perceptions.

In the following section, we revisit Professor Summers' hypotheses of under-representation of women in science and put it in the context of our present study. In the next section, we discuss the methodology and the data issues. We follow exploratory model building using Akaike Information Criteria AIC and the Bayesian Information Criteria BIC. Finally, we discuss empirical results and their implications for a group of fifty countries listed as high human development index (HDI) countries in understanding the issues of gender and science from an international perspective.

2.1 Why are there fewer women in Science: Opportunities or Abilities?

We begin by asking if the issue of under representation of women in science and engineering is about the abilities of women or the opportunities for women in science, technology and other professional and technical areas of expertise. Professor Summers[2] offered three possible hypotheses for these remarks:

1. High-powered job hypothesis: implying that only men can do the high intensity jobs partly because of the huge time commitment which is sometimes as high as eighty hours a week to succeed and which women professionals find extremely difficult. Most women choose family over these demanding professions.
2. Socialization and patterns of discrimination: Our social culture promotes the idea that trucks are for boys and dolls are for the girls. Besides, there exists widespread discrimination against women in these types of occupational and professional areas.
3. Availability of aptitude at the high end: due to smaller variability among women's aptitude in science gives smaller pool of available women candidates: Referring to the work of Xie and Shauman (2003), he suggested that the distribution of women with abilities in math and science was narrower with smaller standard deviation as compared to those for men. The thinner tails in the distribution of aptitudes for women implied that there are fewer women who reach high positions and who would belong to the extreme ends of the upper tail areas and there are even fewer who would be considered genius or outstanding and are closer to being outliers.

[2] See also Becker-Posner at http://www.becker-posner-blog.com/archives/2005/01

While the first two hypotheses refer to cultural perceptions, social orientation and the lack of opportunities for women, the third hypothesis refers to the abilities of women. Summers' remarks implied that women do not have the same aptitude and ability as men. These remarks stirred up a hornet's nest and uproar in the academic community and media. Women's rights groups and several feminist groups around the world were outraged. The remarks and the debate that followed created enough fire to culminate in the resignation of Professor Summers from his prestigious position at Harvard.

One could view this entire debate about gender and science either in terms of opportunities or in terms of abilities. While the question of abilities and aptitudes seems closer to the field of developmental psychology and behavior, the question of opportunities is an economic issue. As evidenced in Goldin (2006a 2006 b), the studies suggest that women are successfully mixing careers with families. Other studies by Lim (2002), Goldin (2003), Goldin, and Katz (2005) provide ample evidence regarding the issue of individual choice of occupation by females. Their studies conclude that women who opted for science in college stayed on and maintained balance between profession and family. Studies by Braselmann (2003), Erwin (2003) and Rosser, Sue V. and Eliesh O'Neil Lane (2002) all provide documentation that women had to face many obstacles in getting into science and related fields. Despite the fact that women have been earning more than one-quarter of the Ph.D.s in science for the last thirty years, the wage gap persists. Two reports, one from MIT (1999)[3] and other from Harvard (2006), report on the status of female faculty in science in their respective institutions. These reports reiterate the lack of equal opportunities for women faculty members. The percentage of current tenured female faculty in sciences is only about 16-18%, and they remain highly underrepresented. A recent study funded by the American Association of University Women Educational Foundation (2006) observed that ten years after college, women earn only sixty-nine percent of what men earn. Even after controlling for hours, occupation, parenthood, and other factors known to affect earnings, the study found that one-quarter of the pay gap remains unexplained.

We take the view that the issue of under representation of women in science and engineering is not about the abilities of women; it is all about the opportunities for women in science, technology and other professional and technical areas. In this study, we examine the availability of economic opportunities for women from an international perspective. We further examine its implications for the economic development of a country.

3. Methodology and Data

Solow (1993: 153), after noting that occupational segregation by gender has been changing only slowly and specifically commented that the women's slow progress in economics is often ascribed to gender differences in intellectual style. He remarked that "……….there has been a tendency for male economists to patronize women, and that is just as damaging as keeping them out of the club." The attitude Solow describes is not, of

[3] See the data in appendix 2

course, unique to economics but rather permeates the other professions as well and helps to explain why in addition to the well-documented high degree of occupational segregation there is also substantial vertical segregation within occupations, with men occupying the top positions and women clustered in the lowest ranks. This vertical segregation, the so called "glass ceiling" has continued in all of science, engineering and technology. According to the National Science Foundation (2006), the percentage of women in science and engineering professions in the US is less than four percent of the labor force and the female scientists, on average, receive thousands of fewer dollars than their male counterparts. It is no coincidence that only twelve women received the Nobel Prize in science since its inception in 1901, which is less than one female Nobel laureate for every forty male laureates in this award category. The "tipping phenomena[4]" that has happened in many other occupations and professional categories, is yet to happen in science, engineering and technology.

We study data from the fifty countries, spread over five continents, and classified as high human development (HDI) index countries by the United Nations Human Development Report. These countries represent better quality of life, higher attainment levels in education and health services and higher incomes. The level of science and technology is expected to be much higher in these countries and therefore, whatever we observe and analyze for this group of countries is likely to be useful for other countries. According to the Human Development Report 2005, fifty-seven countries qualified in the category of High Human Development with an index value of .796 and above. Norway topped this list and the US ranked number ten behind Sweden, Canada and Australia. Because of non -availability of data on all macro variables of interest, we look at the data for fifty countries. The table in the appendix provides country specific details. United Nations Development Program collects gender related data for preparing Gender Empowerment Measure (GEM) and Gender Development Index (GDI).

The GEM and GDI provide a holistic and comprehensive view of the shifting balance and changing position of women in professional services and in science and industry.[5] The gender empowerment measure (GEM), measures women's participation in professional, economic and political life[6]. GEM exposes inequality in opportunities for women over time and across countries. It focuses on gender inequality in economic and political participation and in decision-making. It tracks the share of seats in parliament held by women; number of female senior officials and managers; and of female professional and technical workers- and the gender disparity in earned income that reflects economic independence.

The Human Development Index (HDI) measures average achievements in a country, but it does not incorporate the degree of gender imbalance in these achievements. The gender-related development index (GDI) measures achievements in

[4] The 'tipping' phenomenon, whereby an occupation switches from dominance by one demographic group to dominance by another., has occurred in various occupations.

[5] The Gender gap information from the World economic Forum is another source for measuring women's participation in the workforce.

[6] See the technical note of Human Development Report 2005 for detailed definitions and formulas.

the same dimensions using the same indicators as the HDI but captures inequalities in achievement between women and men. It is simply the HDI adjusted downward for gender inequality. The greater the gender disparity in basic human development, the lower is the country's GDI relative to its HDI. For the top ten ranked countries, GDI ranking is different from that of HDI. Of these, the US, Sweden, Canada and Switzerland improved their ranking which suggests that these countries have achieved higher gender equality than their peer countries. For the US, its GDI rank is eight and is higher than its HDI rank of ten. This implies that the US has lesser gender inequality in all three areas of achievement than its peer countries. Where as Japan and Ireland both have a GDI rank which is much lower than their respective HDI ranks and thus implying greater gender inequality.

4. Results and Policy Implications:

We first look at the summary statistics of all the variables of interest.

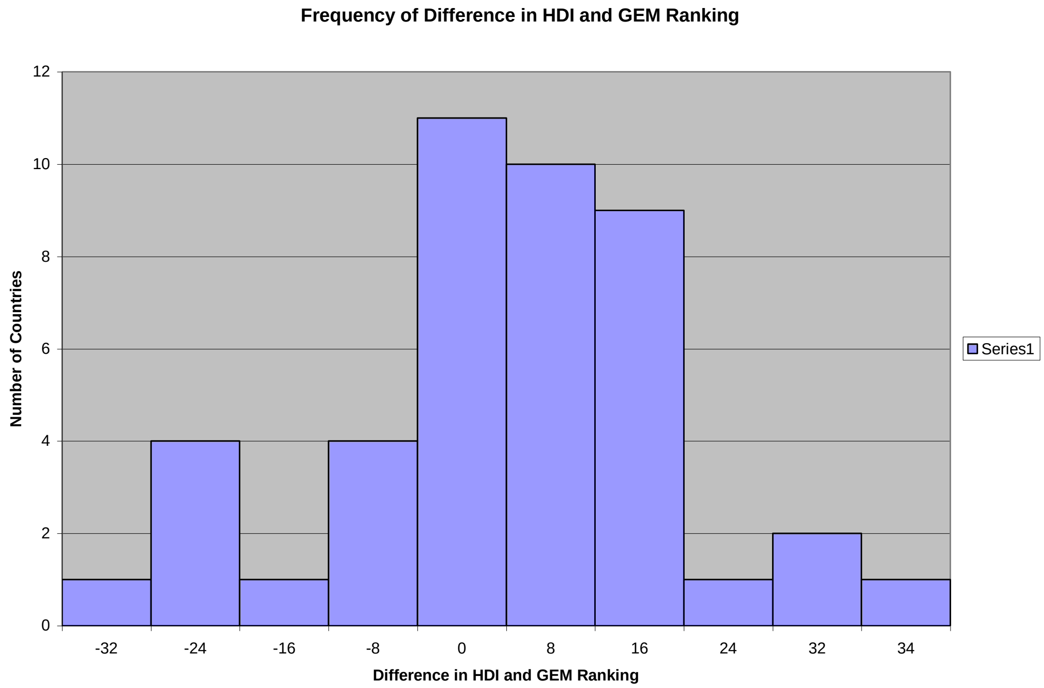
Summary Statistics for all variables

	PROFESSIONAL	HDI	GEM	GDPCI	FEMAINC	EXPEDU	EDU
Mean	0.503400	0.895560	0.628300	9.874678	0.546200	4.764000	0.941400
Median	0.510000	0.905500	0.618500	9.903161	0.555000	5.150000	0.960000
Maximum	0.710000	0.963000	0.928000	11.03968	0.900000	8.500000	0.990000
Minimum	0.190000	0.801000	0.000000	8.832588	0.000000	0.000000	0.760000
Std. Dev.	0.097491	0.048816	0.200338	0.489174	0.147688	2.045479	0.049240
		-	-	-		-	-
Skewness	-0.621021	0.356450	1.664774	0.220429	-0.823900	0.990424	1.408075
Kurtosis	4.757738	1.735834	6.449622	2.411839	5.321281	3.812191	5.043943
Jarque-Bera	9.650655	4.388208	47.88703	1.125601	16.88248	9.548770	25.22584
Probability	0.008024	0.111458	0.000000	0.569612	0.000216	0.008443	0.000003
Sum	25.17000	44.77800	31.41500	493.7339	27.31000	238.2000	47.07000
Sum Sq. Dev.	0.465722	0.116766	1.966627	11.72527	1.068778	205.0152	0.118802

While the education index EDU is over 90%, the average proportion of women professional and technical workers (Professional) remains much smaller, with an average of 50.3% and a maximum of 71%. The HDI index is o.89 and the average proportion of female income to male incomes is slightly over fifty percent (54%) and the average expenditure on education is less than 5% of the GDP.

For a better understanding of the equality of opportunities internationally, we look at differences in ranks between the three indicators the GEM, the HDI and the GDI for this group of countries.

Figure 1: Frequency distribution of Difference in Ranks between GEM and HDI



From Figure 1, we find that one fifth of the countries have lower GEM ranking including the US as compared with HDI, about half the countries show overall equal distribution and about a third of the countries have improved gender ranking. For the US, the GEM Rank is twelve and is lower than the HDI rank of ten. This is a negative indicator of gender equality. Costa Rica and Panama, Germany and the Scandinavian countries have higher gender empowerment rank than the HDI. Overall, it suggests that four fifths of the countries have either comparable ranking or better with respect to the gender issues. The few exceptions are Japan, Korea, Malta, Chile, Italy and Bahrain.

If men and women were equal participants and equal beneficiaries of the development process, there would be no significant difference, on the average, in the ranking of a country with respect to the two indicators GDI and HDI. We test for the equality of HDI and GDI ranks using four nonparametric tests: Mann Whitney, Wilcoxon, Kruskal Wallis and van der Waerden tests. These results are given in Table 1. We used E-views software to carry out these tests.

Table 1: Test of equality of GDI and HDI ranks

Method	df	Value	Probability
Wilcoxon/Mann-Whitney		0.358849	0.7197
Wilcoxon/Mann-Whitney (tie-adj.)		0.358901	0.7197
Med. Chi-square	1	0.181818	0.6698
Adj. Med. Chi-square	1	0.045455	0.8312
Kruskal-Wallis	1	0.131785	0.7166
Kruskal-Wallis (tie-adj.)	1	0.131823	0.7165
van der Waerden	1	0.034981	0.8516

Based on the p-values, we conclude that the median difference between ranks of HDI and GDI is not significant. The broader picture gives the hope and optimism that with more economic development, there would be greater gender equality. As countries progress and experience economic growth, higher educational and health standards as reflected in their respective HDI, they also tend to have higher GDI implying greater gender equality. This also is a positive development because it suggests that the countries, which are improving in overall quality of life, are also improving with respect to gender equality and gender empowerment. While high HDI is a necessary condition, neither gender equality nor gender empowerment alone can guarantee more women in sciences or less occupational segregation. Higher HDI, GEM and GDI merely facilitate such a process.

We do not have homogenous and comparable international data on the number of women in science, engineering and technology (SET) professions. In the absence of a variable that can directly capture women's' participation in SET, we use "proportions of female professional and technical workers "as a proxy variable. Using data from ILO, UNESCO and the United Nations human Development Report 2005, analyze several variables related to gender, economic activity and development. As in many studies (see, UNDP report 2005), we use log of per capita income (LOG (GDPCI)) as a proxy for economic development. Other socio economic factors such as the ratio of female incomes to male incomes (FEMAINC), and public expenditure on education as a percentage of GDP (EXPEDU) have been suggested as likely factors that contribute to growth and gender empowerment and gender participation in the professional areas.

Table 2 below shows the coefficients of correlations between all these variables: GEM, GDI, HDI, GDPCI, FEMAINC and PROFESSINAL. Their t-values are shown in parenthesis. Most correlations are significant at 5%, except the correlations that have been highlighted. Of these, the most surprising were the fact that the correlations between PROFESSIONAL and HDI and GEM and GDPCI were not significantly different from zero.

Table 2: Correlation Coefficients and their significance

	PROFESSIONAL	*HDI*	*GEM*	*GDPCI*	*FEMAINC*	*EXPEDU*	*EDU*
PROFESSIONAL	1						
HDI	0.0570969* (0.396225)	1					
GEM	0.2833451 (2.046961)	0.359026 (2.665097)	1				
GDPCI	-0.0508276 -(0.3526)	0.913529 (15.55926)	0.143871 1.007245	1			
FEMAINC	0.5015418 (4.016472)	0.288978 (2.091326)	0.573923 (4.85555)	0.120411	1		
EXPEDU	0.4397654 3.39243	0.336419 (2.475041)	0.551319 (4.578301)	0.089941 (0.625666)	0.507964 (4.085631	1	
EDU	0.5622893 (4.710925)	0.654024 (5.989913)	0.635298 (5.699415)	0.419373 (3.200544)	0.633021 (5.665289)	0.591368 (5.080739)	1

Although there are no previous studies that have analyzed women in science and economic development from an international perspective, we use the information above and try exploratory model building. We use regression modeling to determine the possible factors that are likely to influence the proportion of women professional and technical workers and hence the participation of women in Science, Engineering and Technology. The exploratory model building selects the best regression model using the well known information criteria: Akaike Information criteria (AIC) and Bayesian Information criteria BIC also known as the Schwartz Information Criteria (Green 2003),

$$AIC = -2(l/T) + 2(k)/T$$

$$BIC = -2(l/T) + k(\log T/T)$$

Where

l= maximized value of the likelihood function for the estimated model

T = the number of observations, same as the sample size

k= number of free parameters to be estimated; in a linear regression, it will be equal to the number of the regressors including the constant

Best model has the smallest AIC or BIC in the sense that the distance fro the true model is the smallest.

We have fitted several models to the cross-country data on fifty countries on women professionals with female literacy (EDU) and EXPEDU, HDI, GEM, and GDPCI and FEMAINC. Some of the possible factors are the education index which reflects enrollments and level of literacy in a country and the Gender Empowerment Measure (GEM). Although, from Table 1 we notice that the dependent variables does not have any significant correlation with HDI and GDPCI, but the regression results show the significance of HDI. Education index, HDI and the Expenditure on education all three seem to be significant factors in explaining the proportions of female professionals.

The detailed regression model results are given in appendix 3 along with the AIC and BIC. Below we present two models. The results are very clear and supportive of the models as seen from the table below:

Model 1: Dependent Variable: FEM_PROF (PROFESSIONAL)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	41.98388	39.01461	1.076106	0.2879
GEM	-9.039096	6.994210	-1.292368	0.2031
EDU	177.5239	36.46202	4.868735	0.0000
EXPEDU	1.196982	0.649621	1.842586	0.0723
FEMAINC	10.05415	9.084209	1.106772	0.2745
GDPPPP	0.000424	0.000208	2.040623	0.0475
HDI	-193.7387	51.79283	-3.740647	0.0005

Adj. R square = 0.55 ,
Akaike Information = 6.783364;
Schwarz Information = 7.051048

Model 2

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EDU	197.8513	33.45520	5.913917	0.0000
HDI	-277.3336	76.47641	-3.626394	0.0007
LOG(GDPPPP)	15.47643	6.490887	2.384331	0.0214
C	-45.96219	26.38283	-1.742125	0.0883
EXPEDU	1.173208	0.640732	1.831042	0.0737

Adj. R-square = 0.52
Akaike info criterion 6.770459
Schwarz criterion 6.961661

Although adjusted R- square is higher for model 1, we choose model 2 based on its p-values and significance of the variables in the model. Akaike and Schwartz information criteria also supports that Model 2 should be preferred to model 1. Education, and Log GDP per capita, HDI and Expenditure as percentage of GDP are all significant factors.

Using data from fifty developed countries all of whom have high human development index, we find that high index of achievement in female education and high per capita incomes are important factors that would also contribute to the growth of professional and technical women workers. Gender empowerment index, though highly desirable, does not guarantee increased participation of women in science and technology.

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Appendix:

TABLE 1: GEM, HDI and GDI Ranks for countries with High Human Development

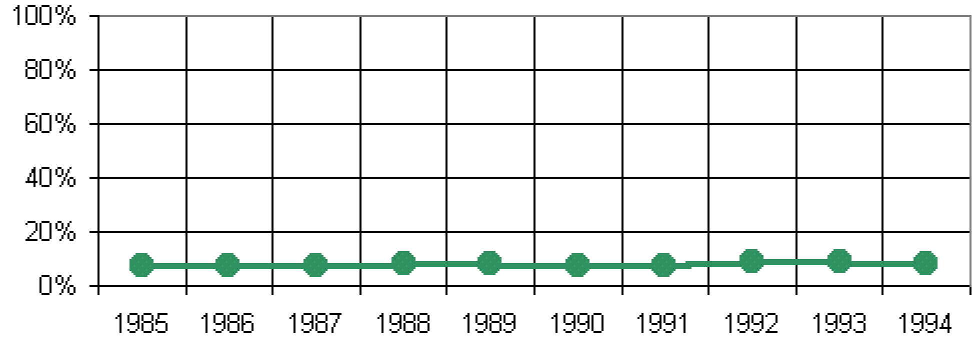
Data source: Human Development Report 2005

Country	GEM rank	HDI Rank	GDI Rank	HDI-GDI Rank	HDI -GEM Rank	GDI-GEM Rank
Norway	1	1	1	0	0	0
Iceland	4	2	3	-1	-2	-1
Australia	7	3	2	1	-4	-5
Canada	10	5	5	0	-5	-5
Sweden	3	6	4	2	3	1
Switzerland	11	7	6	1	-4	-5
Ireland	16	8	11	-3	-8	-5
Belgium	6	9	9	0	3	3
United States	12	10	8	2	-2	-4
Japan	43	11	14	-3	-32	-29
Netherlands	8	12	12	0	4	4
Finland	5	13	10	3	8	5
Denmark	2	14	13	1	12	11
United Kingdom	18	15	15	0	-3	-3
Austria	13	17	19	-2	4	6
Italy	37	18	18	0	-19	-19
New Zealand	14	19	17	2	5	3
Germany	9	20	20	0	11	11
Spain	15	21	21	0	6	6
Israel	24	23	23	0	-1	-1
Greece	36	24	24	0	-12	-12
Slovenia	30	26	25	0	-4	-5

Portugal	21	27	26	0	6	5
Korea, Rep. of	59	28	27	0	-31	-32
Cyprus	39	29	28	0	-10	-11
Barbados	25	30	29	0	5	4
Czech Republic	34	31	30	0	-3	-4
Malta	58	32	32	-1	-26	-26
Argentina	20	34	34	-2	14	14
Hungary	44	35	31	2	-9	-13
Poland	27	36	33	1	9	6
Chile	61	37	38	-3	-24	-23
Estonia	35	38	35	1	3	0
Lithuania	26	39	36	1	13	10
Slovakia	33	42	37	1	9	4
Bahrain	68	43	41	-2	-25	-27
Croatia	32	45	40	1	13	8
Uruguay	50	46	42	0	-4	-8
Costa Rica	19	47	44	-1	28	25
Latvia	28	48	43	1	20	15
Mexico	38	53	46	-1	15	8
Bulgaria	29	55	45	1	26	16
Panama	40	56	47	0	16	7

Appendix 2:

Percentage Women Faculty in the School of Science at MIT – 1985-1994



Gender	1985*	1986*	1987	1988	1989	1990	1991	1992	1993	1994
Female	22	22	21	24	23	22	22	24	24	22
Male	271	269	273	272	265	267	261	253	253	252
Grand Total	293	291	294	296	288	289	283	277	277	274
% Female	7.5%	7.6%	7.1%	8.1%	8.0%	7.6%	7.8%	8.7%	8.7%	8.0%

Source: A Study on the Status of Women Faculty in Science at MIT

Regression Results

Dependent variable: Female Professionals

Variable	Coefficient	Std. Error	t-Statistic	Prob.		
C	41.98388	39.01461	1.076106	0.2879	Adjusted R-squared	0.521952
GEM	-9.039096	6.99421	-1.292368	0.2031	Log likelihood	-162.5841
EDU	177.5239	36.46202	4.868735	0	Durbin-Watson stat	1.937257
EXPEDU	1.196982	0.649621	1.842586	0.0723	Akaike info criterion	6.783364
FEMAINC	10.05415	9.084209	1.106772	0.2745	Schwarz criterion	7.051048
GDPPPP	0.000424	0.000208	2.040623	0.0475	F-statistic	9.916684
HDI	-193.7387	51.79283	-3.740647	0.0005	Prob(F-statistic)	0.000001

Variable	Coefficient	Std. Error	t-Statistic	Prob.		
C	-44.31465	28.15912	-1.573723	0.1226	Adjusted R-squared	0.487501
EDU	194.1872	38.63137	5.02667	0	Log likelihood	-165.4603
LOG(GDPPPP)	11.07491	6.145813	1.802026	0.0782	Durbin-Watson stat	2.04679
HDI	-226.2303	74.02219	-3.05625	0.0038	Akaike info criterion	6.818414
FEMAINC	9.316101	8.928598	1.0434	0.3023	Schwarz criterion	7.009616

Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**		
C	**-45.96219**	**26.38283**	**-1.742125**	**0.0883**	**Adjusted R-squared**	**0.511498**
EDU	**197.8513**	**33.4552**	**5.913917**	**0**	**Log likelihood**	**-164.2615**
HDI	**-277.3336**	**76.47641**	**-3.626394**	**0.0007**	**Durbin-Watson stat**	**1.995299**
LOG(GDPPPP)	**15.47643**	**6.490887**	**2.384331**	**0.0214**	**Akaike info criterion**	**6.770459**
EXPEDU	**1.173208**	**0.640732**	**1.831042**	**0.0737**	**Schwarz criterion**	**6.961661**

Variable	Coefficient	Std. Error	t-Statistic	Prob.		
					Adjusted R-squared	0.310324
EDU	45.41194	6.443862	7.047317	0	Log likelihood	-173.4329
GDPPPP	-0.000137	0.000116	-1.187241	0.2412	Durbin-Watson stat	2.007392
FEMAINC	26.12675	9.970488	2.620408	0.0119	Akaike info criterion	7.097316
GEM	-5.712019	7.248948	0.787979	0.4348	Schwarz criterion	7.250278

Variable	Coefficient	Std. Error	t-Statistic	Prob.		
					Adjusted R-squared	0.35332
C	-50.68922	26.2788	-1.928902	0.0599	Log likelihood	-171.8236
EDU	105.0654	32.40257	3.242501	0.0022	Durbin-Watson stat	1.87407
GDPPPP	-0.000211	0.000119	-1.770475	0.0833	Akaike info criterion	7.032945
FEMAINC	12.27997	10.02335	1.225137	0.2268	Schwarz criterion	7.185907

Dependent variable is HDI

Variable	Coefficient	Std. Error	t-Statistic	Prob.		
					Adjusted R-squared	0.823955
C	0.762285	0.023013	33.12467	0	Log likelihood	109.5922
FEINC	5.29E-06	5.29E-07	9.989853	0	Durbin-Watson stat	1.035777
ENROLLF	0.00058	0.000286	2.026543	0.0492	Akaike info criterion	-4.845101
					Schwarz criterion	-4.723451

Dependent variable is GEM

Variable	Coefficient					
		Std. Error	t-Statistic	Prob.	Adjusted R-squared	0.617247
C	-0.596711				Log likelihood	47.25707
FELIT	1.12E-02	0.336769	-1.77187	0.0844	Durbin-Watson stat	1.979635
GDPPCI	8.67E-06	3.47E-03	3.228555	0.0026	Akaike info criterion	0.128301
		1.33E-06	6.52575	0	Schwarz criterion	-2.158881