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**Gender Disparities in Economic Freedom and
Human Capital**

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Gender Disparities in Economic Freedom and Human Capital*

Abstract: When a country reduces gender disparity in economic freedom, gender gaps in educational outcomes close. Economic freedom raises incomes and economic growth, partly through increased human capital investment. When men and women differ in the economic freedom they experience, we expect girls and boys to face different returns to human capital investment. Using country-level panel data and country fixed effects, I estimate how gender disparity in economic freedom affects gender gaps in human capital accumulation. Closing gender disparities in economic freedom can improve female literacy rates and female learning outcomes.

JEL Codes: O15, E24, I2

Keywords: gender gaps, economic freedom, human capital

Abbreviations:

EFW, Economic Freedom of the World

GDLR, Gender Disparity in Legal Rights

GDP, Gross Domestic Product

HLO, harmonized learning outcomes[†]

OECD, Organization for Economic Cooperation and Development

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1. Introduction

In high-income countries, gender gaps in educational attainment have closed and even reversed with women staying in school longer than men (OECD 2022). In much of the rest of the world, however, women continue to lag men in literacy rates, educational attainment, and other measures of human capital (UNESCO 2022). Yet, female education is particularly important for economic development with gender gaps in education significantly slowing economic growth (Klasen and Lamanna 2009, Cuberes and Teigneir 2016).

Previous research documents higher rates of return to schooling (King et al. 2012) and more human capital investment (Dawson 1998; Aixalá and Fabro 2009) in areas with more economic freedom. Feldmann (2017) describes three ways that economic freedom is likely to affect educational attainment: protection from having higher earnings appropriated by the government, increased gains from market trade that incentivize investment in human capital, and the strengthening of capital markets facilitating human capital investment. He finds that more people enroll in secondary school in countries with higher economic freedom. This investment in human capital likely drives some of the effect of economic freedom on economic growth, labor productivity, and upward income mobility (Dean and Geloso, forthcoming; Boudreaux 2014).

Economic freedom particularly benefits women (Stroup 2008), increase female labor force participation (Grier 2023) reduces gender wage gaps (Weichselbaumer and Winter-Ebmer 2007; Weichselbaumer, D., and R. Winter-Ebmer). In some places, however, economic freedom

differs significantly for men and women (Fike 2016). Possibly as a proxy for these differences, some research controls for religious participation in Islam or Catholicism.¹

The Fraser Institute's Economic Freedom of the World (EFW), in 2017, began addressing these gender differences empirically. Using data from the World Bank's *Women, Business, and the Law* and the OECD's *Gender, Institutions, and Development Database* (OECD 2014), the EFW created an Index of Gender Disparity in Legal Rights (GDLR). In the analysis below, I use this index as a measure of differences in economic freedom by sex.

Specifically, this paper explores how gender disparity in economic freedom affects gender gaps in education. In places where women are afforded less economic freedom than men, we expect the return to investing in human capital to be lower for girls. Sex-specific measures of educational outcomes include the World Bank's globally representative harmonized learning outcomes (HLO) and measures of gender disparity in educational attainment and participation.

I find that, as a country reduces gender disparity in economic freedom, literacy rates among women improve. However, I find little significant difference in gender gaps in other educational outcomes across countries with varying economic freedom faced by women and men. The evidence in development economics consistently shows that investing in education, and particularly female education, is a strong driver of economic development (Mankiw, Romer, and Weil, 1992; Schultz, 2002; Hassan and Cooray, 2015). My results suggest that closing gender gaps in economic freedom may increase literacy in girls.

2. Economic freedom and human capital investment

¹ For example, Feldman (2017) finds that countries with more Islamic adherents have lower educational attainment; other research suggests this negative impact of Islam is stronger for women (Cooray and Potrafke, 2011; Feldmann, 2016a; Norton and Tomal, 2009).

Since its inception in 1996, hundreds of research studies have considered how economic freedom affects a variety of outcomes around the world (Hall and Lawson, 2014). A small fraction of this considers the role of economic freedom in human capital investment.

Economic freedom affects human capital investment for a variety of reasons. Individuals invest more in human capital when they expect higher returns from that investment. King et al. (2012), in fact, estimate higher returns to schooling in more economically free, developing countries. Feldmann (2017, 2019) describes a few reasons why the return to schooling may be higher in more economically free countries. For example, intrusions on economic freedom – such as governments’ propensity to appropriate one’s earnings – limit the potential for returns; some expansions of economic freedom increase the potential for returns such as capital markets that facilitate investment and more expansive trade that provides educated workers with wider markets. Further, Feldmann (2021) finds more positive regard for education, as measured by the World Values Survey, in more economically free countries.

Earlier work suggests that enrollment rates in primary school and secondary school are positively correlated with economic freedom (Aixalá and Fabro, 2009; Dawson, 1998). In the paper most similar to this one, Feldmann (2017) uses panel data and fixed effects estimation to estimate how the EFW affects educational attainment. He finds that educational attainment is higher in countries where economic freedom is higher; he finds similar, albeit slightly smaller, effects for female educational attainment. Grier (2023) similarly finds increased female completion of primary school in countries experiencing jumps in economic freedom.

The current study builds on this research and adds to the literature by examining gender-specific differences in economic freedom and human capital investment. I explicitly consider how the economic freedom experienced by women affects their human capital investment.

Further, given the disconnect between educational attainment and human capital (Angrist et al. 2021), I analyze explicit measures of human capital by sex including the Harmonized Learning Outcomes (HLO) produced by the World Bank and literacy rates.

3. Empirical approach and data

Economic Freedom of the World and Gender

The Fraser Institute's Economic Freedom of the World index measures institutional quality at the country-level from 1975 to the present (Gwartney et al. 2022). The index scores countries higher when property rights are more secure, trade freer, money and prices more stable, and government spending and regulations are lower (Hall and Lawson 2014). The index potentially ranges from 0 to 10, although, in practice, scores range from about 3 to about 9.

Fike (2016) criticized measures of economic freedom that fail to recognize that, in some countries, the economic freedom that women and men experience differs. In response, the Fraser Institute's Economic Freedom of the World index addressed gender differences by creating an Index of Gender Disparity in Legal Rights (GDLR). The index is based off a series of questions about whether men and women (or, in some cases, married women) have the same economic freedoms in the country at that time. The bulk of the questions stem from formal legal differences in how men and women are treated. This includes questions about any additional steps required, for example, for women to open a bank account or get a passport as well as restrictions on inheritance, occupations, and the like. A small fraction of the questions includes expert assessments of social norms and their differential enforcement for men and women. If women and men experience no differences, the index equals one; if all indicators differ by sex, the index equals zero. See Fike (2017) for more details.

The GDLR address two of the three reasons given by Feldmann (2017) for a relationship between economic freedom and education. First, if women face fewer opportunities for market trade, returns to schooling would be lower, implying less investment in human capital. Second, if access to capital markets is more obstructed for women, returns to schooling would be lower, implying less investment in human capital.

The EFW then uses the GDLR to adjust its Area 2 measure of Economic Freedom. In the analysis below, I use the historical index of economic freedom, unadjusted by the GDLR. I also use the GDLR index. This index equals one for countries where men and women experience the same amount of economic freedom. This difference is smaller for country-years where women experience less economic freedom than do men. Figure 1 maps the country average of this index during the sample period. Kuwait, Oman, Jordan, and Egypt have some of the lowest scores on the GDLR; in most high income countries, women experience similar economic freedom as do men.

Twenty-three countries have a GDLR equal to one in all the observed years since 2000. In some specifications, I exclude these countries with always observed gender parity under the law.²

Measures of Human Capital by Gender

I analyze a wide range of measures of human capital by gender. The World Bank's World Development Indicators measure a variety of gender disparities in human capital attainment. The measures I use include the ratio of female to male enrollment in primary school, in secondary school, and in primary and secondary school as well as female literacy rates. Although

² The countries are Australia, Canada, Denmark, Ecuador, El Salvador, Finland, Hong Kong, Iceland, Ireland, Liberia, Mexico, Netherlands, New Zealand, Norway, Paraguay, Peru, Singapore, South Africa, Spain, Sweden, United States of America, and Zimbabwe.

enrollment may not fully capture eventual educational attainment levels, educational attainment is typically measured for the population aged 25 years and older. Given the sample period of the data and the number of years necessary to demonstrate an effect on older populations, I focus on enrollment measures. Further, I use a variety of gender differences in human capital to explore how gender differences in economic freedom affect gender differences in human capital.

Research continues to demonstrate a disconnect between educational attainment and learning.³ Because of this disconnect, Angrist et al. (2021) develop the Harmonized Learning Outcomes (HLO) Database. The database provides measures of learning that are comparable across countries and time. Further, they provide gender-specific measures of HLO. I analyze below both the female-specific HLO as well as the gap between male and female HLO in a country. I calculate the gender gap in HLO by subtracting the male HLO from the female HLO. In this way, higher numbers indicate relatively more female human capital.

Empirical Strategy

I estimate for country c in year t the following:

$$\begin{aligned} & \textit{female human capital}_{ct} \\ & = \beta_1 EFW_{ct-5} + \beta_2 \textit{gender difference EFW}_{ct-5} + X' \delta + \tau_t + \kappa_c + \varepsilon_{ct} \end{aligned}$$

The coefficient of interest is β_2 . Because gender difference EFW is larger for countries where women are less free than men, we would expect β_2 to be negative when the dependent variable measures improvements in female human capital.⁴ We may also be interested in β_1 given the results in Feldmann (2017) and other research on how economic freedom affects human capital accumulation.

³ See, for example, Pritchett (2013).

⁴ In results available by request, I also estimate using the unadjusted EFW index and the GDLR with qualitatively similar results.

In results not reported here, some specifications include a vector of control variables. These variables are a measure of democracy/autocracy called polity2, the population who are urban, logged real GDP per capita, the growth rate in GDP per capita, the percent of the population aged under 15, the mortality rate of 5- to 9-year-old children, and the population growth rate. Most of these measures are provided by the World Development Indicators from the World Bank. The exception is polity2, an index produced by the Center for Systemic Peace to measure “democratic and autocratic authority in governing institutions.” Polity2 ranges from -10 (hereditary monarchy) to 10 (consolidated democracy). Polity2 accounts for destabilizing – and stabilizing – changes in a country that may discourage or encourage investment in human capital. We might expect more urban, higher income, and faster growing countries to invest more in education. Places with more young people may find schools overcrowded, reducing human capital attainment. Countries with high mortality rates of young children may limit investment in children given a lower life expectancy. Higher population growth rates may reflect optimism for the future, increasing human capital, or lead to capacity-constrained schools, reducing human capital. The results presented in Tables 4 and 5 are robust to the inclusion of these control variables.

Year fixed effects account for global changes in human capital over time. Country fixed effects control for any time invariant characteristics of countries that influence human capital such as unchanging social norms around schooling or gender roles, general characteristics of the school system, and the like. Woessman (2016), for example, documents that the relative performance of educational systems across countries is “consistent over time” (p.8). Cooray and Potrafke (2011) find that religion and social norms affect gender disparities in education; they find that Muslim countries, in particular, have lower relative rates of female school enrollment.

Whether a country is a Muslim country is likely picked up in the state fixed effects. To the extent that there are changes in the Islamic nature of a country that affect how much economic freedom women experience, I expect the relevant changes to be picked up in the GDLR.

Sample of Countries and Years

The sample of country-years available for the analysis differs by outcome measure. Table 2 describes those samples. I focus on the years 2005 through 2020 because many outcomes are available on an annual basis for these years. I observe literacy rates and enrollment ratios for more countries than we observe HLO measures. The number of countries include ranges from 69 to 153. None of these samples are balanced panels.

Most of the results presented below are null results. One outcome consistently demonstrates a statistically significant relationship with the GDLR: female literacy. Because it is the primary result, I describe its sample in more detail here. In this sample of 125 countries, I observe 32 countries only once; because of the included country fixed effects, these observations do not help identify the relationship between GDLR and female literacy. The sample includes 28 countries with two observations; 22 with 3 observations; 6 with 4 observations; 6 with 5 observations; 7 with 6 observations; and another 24 countries with seven to 15 years of observations. The sample ranges across the globe with 8 percent of observations in East Asia & Pacific; 16% in Europe and Central Asia; 33% in Latin America & Caribbean; 13% in the Middle East & North Africa; 6% in South Asia; and 23% in Sub-Saharan Africa.

Summary Statistics

Table 1 presents summary statistics of the measures of human capital accumulation. The first set of outcomes are girl-boy ratios of enrollment. The average gender ratio of enrollment is close to one, indicating parity. For primary school enrollment, for example, the values range from 0.63

to 1.16. In some countries, girls enroll in primary school much less often than do boys; in others, girls outnumber boys in primary school.

The HLO variables provide measures of learning comparable across countries and time. I explore measures in three subjects: math, reading, and science. The average difference in all three subjects is positive; on average, girls have learned more than boys. This average masks significant differences across countries. In some countries, girls have learned much less than boys and in others, girls have learned much more than boys. Outcomes for only girls are also examined. Girls' learning outcomes average in the mid-400s with standard deviations between 65 and 97.

The final outcome I consider is female literacy rates. The range of female literacy rates in the sample is quite wide: from countries where fewer than 1 in 7 women are literate to countries where female literacy is almost 100 percent.

4. Results

I estimate a fixed effects regression for each measure of educational attainment on the Economic Freedom of the World Index and the Gender Disparity in Legal Rights (GDLR) index. Table 3 presents results for the gender gaps in human capital. For each outcome, I present results for two specifications: for the full sample and for the sample excluding countries who experience gender parity in legal rights during all of the sample period. Because the countries who treat men and women the same under the law display no within-country variation in GDLR, I exclude them as a robustness check.

The top panel displays results for the ratio of enrollment by gender. Larger values of the dependent variable reflect more girls enrolling in that level of schooling compared to boys. A

positive coefficient on GDLR would imply that more gender equality correlates with a higher ratio of female enrollment to male enrollment. The general pattern is that the effect of changes in EFW on gender ratios in enrollment is positive and statistically insignificant. The coefficients on the GDLR also show a tendency for the relationship to be positive and statistically insignificant.

The bottom panel presents results for the gender gap in learning by subject area. Larger values of the dependent variable imply that girls have relatively more human capital than boys. The results imply that more economically free countries experience larger gender gaps. Increased gender parity is followed by larger gender gaps, except in science where the gap decreases. None of these effects are statistically significant.

In Table 4, I present results for girls' HLO measures by subject and female literacy rates. In this table, I consider female levels of human capital, not comparisons to male outcomes in the same country. More economically free countries show more female learning in math and science, but less in reading; note that the coefficient on EFW is only statistically significant for math. Countries with more gender parity tend to show more female learning with a statistically significant effect for reading in the same excluding the always-parity countries. In that specification, a one standard deviation increase in the GDLR, an increase of 0.18, implies an HLO for girls that is about 17.8 points lower (or about 0.18 standard deviations lower).

The most robust results arise in the regressions using female literacy rates. Here, we observe that countries with more gender parity in economic freedom have much higher female literacy rates. A one standard deviation increase in GDLR implies 4.5 percentage point higher female literacy rates, an increase of about 0.2 standard deviations. These results imply economically

important and statistically significant increases in human capital investment for girls when economic freedom is provided more equally for men and women.

5. Discussion

Economic freedom consistently positively relates to a wide variety of outcomes such as greater economic growth and higher incomes (Hall and Lawson, 2014). One potential mechanism for these relationships is that people invest more in human capital when they experience more economic freedom. This investment may occur because of higher expected returns due to access to wider trading markets, more specialization, and stronger private property rights. Rosemarie Fike (2016) notes, however, that men and women in some countries differ in the economic freedom they experience.

I consider whether gender differences in economic freedom affect investment in females' human capital. Using country fixed effects and country-level panel data, I estimate how gender gaps in learning and education differ in places where women face less economic freedom than men. Most results are null, suggesting that gender differences in economic freedom do not lead to gender differences in human capital. However, I find that female reading achievement and literacy rates are higher when women experience more similar economic freedom as men.

Research in development economics consistently finds that female human capital investment has large spillovers by increasing the health and human capital of their children (Schultz 2002). My results suggest that affording men and women the same economic freedom may be one mechanism to encourage more human capital investment in girls. The results are more robust for female literacy than other measures, perhaps in part because the larger sample size increases the power of the analysis. Other results are more suggestive but support the

conclusion that, as men and women experience similar degrees of economic freedom, that female human capital increases.

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Figure 1: Gender Disparity in Legal Rights

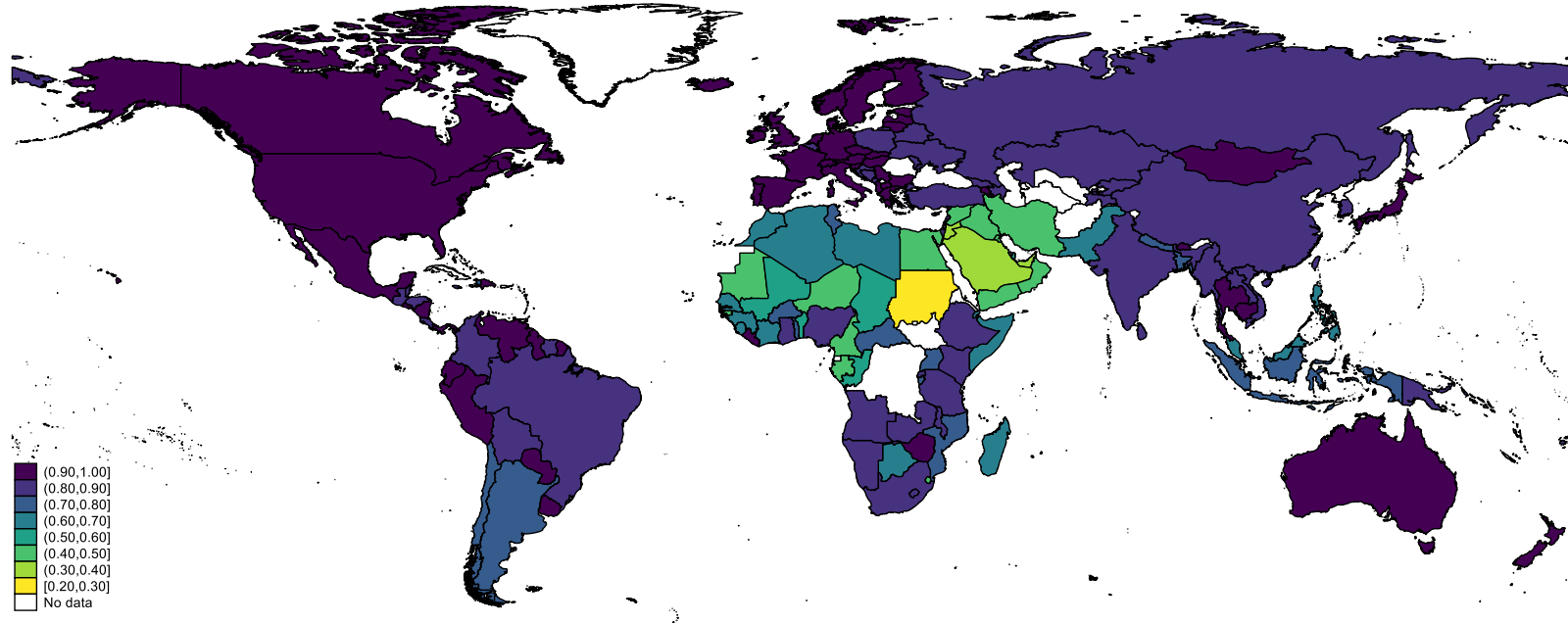


Table 1: Summary statistics of human capital measures and economic freedom

Variable	Obs	Mean	Std. dev	Min	Max
Female enrollment/male enrollment					
primary	1,798	0.97	0.05	0.63	1.16
secondary	1,567	0.99	0.12	0.35	1.39
both	1,527	0.99	0.06	0.61	1.15
HLO Female - HLO Male					
reading	228	11.28	15.09	-31.62	67.02
math	158	0.18	11.05	-20.33	42.91
science	139	1.42	13.97	-15.44	79.34
Female human capital measures					
HLO reading	228	444.50	100.38	226.36	588.15
HLO math	158	464.07	76.51	297.85	619.52
HLO science	139	481.18	65.47	268.25	590.62
literacy rate	507	81.49	20.79	13.93	99.96
Economic Freedom of the World measures					
EFW (unadjusted)	1796	6.92	0.90	3.21	9.09
GDLR	1796	0.84	0.18	0.29	1.00

Table 2: Sample composition by outcome variable

		Girls/boys enrollment		
		primary	secondary	primary & secondary
years		2005-2020	2000, 2005-2020	2000, 2005-2020
N				
countries		153	144	144
<hr/>				
		HLO gender gap (female-male) and female scores		
		reading	math	science
years		2000, 2006-2017	2000, 2006, 2007, 2011, 2013, 2015	2006, 2007, 2011, 2013, 2015
N				
countries		105	79	69
<hr/>				
		literacy rate for girls	literacy rate for girls (not high income)	
years		2005-2020	2005-2020	
N				
countries		125	113	

Table 3: Economic freedom, gender differences in economic freedom, and human capital gender gaps

	primary girls/boys		secondary girls/boys		primary & secondary girls/boys	
	all	not all parity	all	not all parity	all	not all parity
EFW _{t-5}	0.003 (0.004)	-0.001 (0.005)	0.023*** (0.008)	0.022** (0.010)	0.008** (0.004)	0.007 (0.005)
GDLR _{t-5}	0.044 (0.029)	0.029 (0.030)	0.047 (0.056)	0.028 (0.060)	0.025 (0.027)	0.015 (0.029)
N	1,796	1,456	1,566	1,240	1,526	1,207
R-squared	0.881	0.885	0.906	0.911	0.912	0.918

	HLO reading gap		HLO math gap		HLO science gap	
	all	not all parity	all	not all parity	all	not all parity
EFW _{t-5}	2.528 (5.772)	3.236 (6.824)	2.181 (6.763)	4.713 (8.692)	5.606 (7.755)	7.346 (10.486)
GDLR _{t-5}	16.569 (32.009)	27.654 (38.230)	24.546 (27.747)	30.446 (29.084)	-13.998 (22.016)	-1.530 (20.034)
N	228	178	158	109	139	95
R-squared	0.836	0.850	0.847	0.887	0.927	0.941

All regressions include year and country fixed effects. Standard errors are clustered by country.

*** p<0.01, ** p<0.05, * p<0.1

Table 4: Economic freedom, gender differences in economic freedom, and female human capital

	girls' HLO math		girls' HLO reading	
	no controls	not all parity	no controls	not all parity
EFW _{t-5}	20.444*	16.459	-12.044	-10.782
	(11.010)	(12.415)	(15.181)	(16.844)
GDLR _{t-5}	1.105	-8.434	80.327	98.967*
	(24.648)	(29.845)	(54.013)	(58.865)
N	158	109	228	178
R-squared	0.988	0.987	0.978	0.977

	girls' HLO science		girls' literacy	
	no controls	not all parity	no controls	not all parity
EFW _{t-5}	23.494	28.598	2.171**	1.923
	(15.226)	(19.513)	(1.070)	(1.188)
GDLR _{t-5}	15.695	11.554	25.208**	23.882**
	(49.041)	(55.525)	(11.267)	(11.264)
N	139	95	507	403
R-squared	0.979	0.976	0.979	0.979

All regressions include year and country fixed effects. Standard errors are clustered by country. *** p<0.01, ** p<0.05, * p<0.1