The Impact of Globalization on Women

Testing Vandana Shiva's Critique of Development

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ABSTRACT: Vandana Shiva argues that through the masculinization of agriculture globalization has turned nature and women into passive fields for sowing. Shiva's critique that international trade, and globalization more generally, has undermined the social and economic position of women in less developed countries provides a wealth of testable hypotheses. For example, Shiva's argument implies that gender earnings inequality is higher in countries that are more integrated into the world economy, *ceteris paribus*. After summarizing her argument, we test this hypothesis through cross-sectional regression analysis.

I. Introduction

Vandana Shiva, internationally renowned ecological and feminist activist and influential leader in the anti-globalization movement, argues that through the masculinization of agriculture globalization has an adverse effect on gender justice, turning nature and women into passive fields for sowing and permitting corporations to plunder local resources, removing capital from local hands while importing Western concepts of individualism, ownership, and the marketplace into cultures that thrived on community, cooperation, and respect for nature.

Shiva's critique that international trade, and globalization more generally, has undermined the social and economic position of women in less developed countries provides a wealth of testable hypotheses. This paper examines one specific outcome of Shiva's account of globalization: the effects of globalization on gender earnings inequality. Section II offers an overview of Shiva's argument against globalization. Section III uses the example of agribusiness to more fully articulate Shiva's argument that globalization worsens the situation for women. In other words, globalization brings with it gender injustice. This injustice is evident not only in inequitable material distribution, but also in the social effects of epistemological exclusion. Section IV presents an overview of the empirical literature on globalization and gender differences in outcomes. Section V describes the data and methods used to test Shiva's hypothesis. Section VI presents the results and Section VII concludes.

II. Overview of Shiva's argument

Globalization, as it is critiqued by Vandana Shiva, employs a particularly narrow—and Western—understanding of development. Shiva's analysis of the damaging effects of agribusiness and food production illustrates the negative impact of development on women. Her

analysis is primarily aimed at the environmental degradation wrought by globalized, corporatized food production, but given the scope of this paper, we focus on the issues of gender injustice that accompany the environmental destruction. Through either lens, one sees how nature and women both become passive rather than active, how what Shiva calls the "feminine principle" is taken over by the masculinization of agriculture (1988, 2009), and how, as a result, women's inequality and impoverishment deepens. In this section, we explore four key elements of Shiva's critique of globalization. First, we look at the meaning of development and the concentration of global capital in the hands of a few. Then we briefly present Shiva's concerns regarding the outsourcing of pollution and the conditions of workers.

Shiva argues that globalization was enshrouded in myths throughout the 1990s that made it seem inevitable, natural, and unstoppable. With the massive anti-globalization protests of 2000 and 2001, however, these myths were "exploded." The anti-globalization movement revealed the role of major corporations in the forces of globalization. This second era in understanding globalization invited a shift from merely adjusting to an inevitable force to challenging the plan of the powerful (2003, 141-42). As she explains, "We must understand that globalization has not really been about increasing global communication between markets and peoples, but about creating an environment of deregulated commerce at the global level" (2003, 144). Two things had to happen in order for this deregulation to occur: "the deregulation of environmental protections and the over regulation of commerce at the local level" (2003, 144). Powerful corporations worked with governments to effect this change, sometimes even drafting policy.

Biopiracy (1997) is considered a seminal contribution to the anti-globalization movement. Her critique of globalization, however, is not confined to that work. Indeed, Shiva

has consistently held that the dominant measure of development according to the Global North harms the natural world, women, and the poor more than offsetting any of the promises globalization purports to offer. Globalization relies on a limited understanding of economic development which Shiva sees as a corporate hijacking (2000b, 102). Globalization is not a natural force to which we must adjust but rather the will and machinations of a few powerful corporations. Economic development, in this context, focuses on economic growth and capital accumulation rather than production for sustenance (1988, 2010). That, according to Shiva, has serious deleterious effects on nature and women. As she explains,

> The paradox and crisis of development arises from the mistaken identification of culturally perceived poverty with real material poverty, and the mistaken identification of the growth of commodity production as better satisfaction of basic needs. In actual fact, there is less water, less fertile soil, less genetic wealth as a result of the development process. Since these natural resources are the basis of nature's economy and women's survival economy, their scarcity is impoverishing women and marginalized peoples in an unprecedented manner. Their new impoverishment lies in the fact that resources which supported their survival were absorbed into the market economy while they themselves were excluded and displaced by it. (1988, 13)[1]

Cultures that previously thrived on a commitment to cooperation, community, sustenance-based production, and respect for nature are considered "backward" according to the dictates of development. With globalization, these communities must be transformed. Shiva describes how globalization forces the adoption of western concepts of individualism, ownership, and the marketplace into communities that, while poor, were not impoverished (1988,

10-11). This move simultaneously grants permission to corporations owned in the Global North

to appropriate resources from the Global South, taking profit from the hands of local inhabitants

for corporate gain. As the passage above indicates, women and other marginalized peoples

suffer greater harms from this globalization process than men.

In developing her feminist ecological argument, Shiva also employs a critique of sexist

imagery or metaphors used in science. Shiva argues that Sir Francis Bacon (1561-1626) turns

"mother nature" into "female nature, conquered by an aggressive masculine mind" (1994b, 130).

In many ways, this attitude of control and conquest serves as a justification for the

masculinization of agriculture in globalization. If women and nature are passive, and women's

knowledge is undeveloped or backward, then globalization may appear as a positive (and

inevitable) force bringing enlightenment to indigenous peoples. The harms of globalization are

then not only overlooked, they are presented as new opportunities for economic growth.

Two other elements of Shiva's critique that impact her account of gender injustice pertain

to pollution and the conditions of workers. In her activism as well as her writings, Shiva argues

against the "outsourcing of pollution." There are multiple facets to this anti-globalization stance.

First, so-called developed nations literally outsource pollution by exporting garbage. But they

also outsource pollution through their overconsumption of fuel and energy. This leads to the

degradation of globally shared goods like air. Second, the Global North outsources pollution by

moving manufacturing facilities to lesser developed regions. Shiva describes, for instance, the

burgeoning steel industry in India (2002). Steel industrialists from Europe and the United States

have purchased farmland in India to build factories for manufacturing car parts. This has a

twofold damaging effect for women and indeed all local peoples: the loss of farm land decreases

women's productivity (as the majority farmers are women) and the production of steel puts

harmful chemicals into the earth and the air, some of which affect women (especially pregnant women) more drastically than men.

The condition of workers further highlights the destruction wrought by globalization. Shiva argues that, "as a result of globalization, workers' rights are being dismantled and instead of growth generating employment, we are witnessing jobless growth" (2005, 48). Among other things, globalization helps companies avoid their obligation to provide workers' job security in their old age. They violate contracts and outsource jobs so as to save more money. Moreover, the criteria for production often ignore significant work by women. Women have traditionally been the primary food "processers" but with corporatization of food production and processing, the work they traditionally performed is taken over by machines (as when milling rice is mechanized, (2009, 20)) or simply not included in the GDP (as when women work in the home to create bread or in "neighborhood mills [to] produce flour" (2000b, 100; 2009, 19)).

The effects of globalization are wide spread, and the parts of Shiva's critique of globalization ought to be seen as interconnected. Nevertheless, it is also possible to single out various aspects of her argument to measure their salience globally as well. Agribusiness, for instance, has a particularly troubling effect on women's recognition as workers and subsequently on their earnings in relation to men.

III. Agribusiness, the Commons, and Gender Injustice

Agribusiness and the politics of food provide a compelling example through which the issues of gender injustice in the wake of globalization are brought into sharp relief. Food production, processing, and provisioning were "women's domain in the social division of labor" (2009, 18). Globalization empties those roles, leaving women worse off. Agribusiness, the large

scale commercialization of agricultural production and processing, is a key element of globalization. Companies from the Global North purchase small farms to create large, privately owned corporate farms. In addition, however, they also take out patents on seeds, at least some of which have been maintained as heritage seeds for generations by women according to Shiva (139-40, 2005; 2009, 21). In a related practice, companies in the globalized marketplace create seeds that do not regenerate or that purport to be pest resistant, but that also require large amounts of chemical fertilizers. They also exert pressure on farmers to buy these seeds and get the World Bank and other development organizations to cooperate by making the seeds part of the aid packages (2009, 22; see also 1991). Natural processes are thereby turned into chemical processes dependent on huge influxes of purchased inputs each year. Shiva also argues, interestingly, that the economic policies of the World Trade Organization (WTO) are suicidal and genocidal. The rhetoric here is used to focus on the plight of the small farmer, most of whom are women. Small farms stop functioning when global corporations are granted control through deregulated international trade. Exports and imports are liberalized, opening more markets that drive small, local producers out of business.

This entire process of agribusiness affects women in a number of ways. Their status as food producers and processers is stripped away; in addition, women's seed saving and propagating becomes criminalized. The result is women's near erasure from "productive" processes. Shiva sums this up nicely, "I would argue that GNP is becoming, increasingly, a measure of how real wealth—the wealth of nature and that produced by women for sustaining life—is rapidly decreasing. When commodity production as the prime economic activity is introduced as development, it destroys the potential of nature and women to produce life and goods and services for basic needs" (1988, 7). While we might call into question Shiva's

consistent presentation of women as connected with nature in positive, life sustaining ways, her critique of the effects of globalization generally, and agribusiness specifically, on the lives of women certainly merits careful study.

In building her argument, Shiva employs the notion of a commons. Collectively owned and shared, a commons is "the collective economic assets of the poor" (2005, 40). Although generally understood as land, Shiva also speaks of knowledge as a commons. Indigenous knowledge as a commons is shared for the collective well-being or common good. Private property, on the other hand, suggests individual isolation for self-interested reasons. Shiva traces the history of the enclosure movement in the 17th and 18th centuries; enclosures changed the relationship humans have with nature and, in many way, set up the eventual decline of the "feminine principle." During the Enlightenment, nature became understood as *terra nullius* (empty land or land belonging to no one). Natural land was land awaiting cultivation through human industry, rather than an abundantly fertile giver of gifts. In other words, nature became "raw materials." This transformation of the human understanding of nature gave power to the wealthy while the poor lost the valuable resource of the commons. Globalization is a new, more powerful stage of the enclosure movement. While globalization promises greater connections among peoples and a more peaceful global community, Shiva suggests that the opposite has resulted. The result of globalization is a more factionalized, dominated, and conflict-prone world, often at the expense of women. The family and communal relations that have been valued for centuries—that are also constitutive of that "feminine principle"—are destroyed by the "corporate hijacking" of global trade and economic development.

"Biopiracy" is the theft of natural biological processes and materials. Shiva focuses not just on land but also on other forms of pirated commons including seed knowledge and even

human imagination. Corporations or countries patent seeds or plants that had been previously shared communally or collectively. This theft of indigenous knowledge is often seen as a sign of development in Western terms. Seeds that had been saved and shared for generations are now marketed and traded, a practice touted as development. Human sustenance is not the goal of agribusiness. This aspect of biopiracy affects the social status of women who were the seed savers and the primary farmers. Biopiracy also destroys genetic diversity, a strength of women according to Shiva: "Diversity is the patter of women's work, the pattern of women's planting and sowing of food crops and the pattern of women's food processing" (2009, 19). Although there is reason to question the assertion of women's association with diversity, Shiva does show that by creating a monoculture of seeds, biopiracy exploits the knowledge of indigenous men and women for the profit of corporations based in the Global North.

Shiva's defense of seed sharing and natural seed regeneration is also a defense of the commons. To share something openly and freely supports sustainability and strengthens women's place in the community. In contrast, privatizing seeds and knowledge weaken women's social and economic status by robbing them of work and creating property for the commercial gain of a limited few (1994b, 2001). Shiva calls this the "masculinization of agriculture." Both the social exclusion of women's traditions or traditional practices from agribusiness and the epistemological theft of women's seed-saving knowledge are covered in this terminology (Shiva 2009, 18-20).

Globalization has the largest negative effect on women and the poor. The poor suddenly find that privatization, brought on by globalization, deprives them of clean water and basic services. Moreover, global food production impels third world countries to adopt non-sustainable agricultural practices. Another example frequently used by Shiva is shrimp

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production. Shrimp farming for export has destroyed farm land through salinization of formerly productive agricultural fields. Local resources are hence destroyed, and inequality is exacerbated, for the purposes of exporting specialty foods to the Global North. "Trade can only be increased by taking resources away from people's subsistence and survival" (2000b, 97). Women, Shiva argues, continue to struggle to protect nature motivated by human survival. Globalized trade violates the feminine principle when it privileges capital accumulation over sustenance, especially when that capital accumulation clusters in the hands of corporations at the expense of the lives and livelihoods of local peoples as in the shrimp industry example.

Shiva's arguments against globalization and about the effects of globalization on gender justice might be summarized as follows:

(1) Globalization transforms locally owned agriculture for local production into corporate owned industries for global production (or, more specifically, for the Global North).

(2) Global production requires global trade markets.

(3) Global trade markets encourage privatization of seeds. As a result,

(4) Global production privileges certain knowledges with legal and philosophical roots in ownership and markets.

(5) Men are privileged as the knowledge bearers, owners, and traders in a globalized economy.

(6) Men and men's work is considered productive in globalization.

Many of these premises have a necessary corollary according to Shiva. For instance, the fact that global production privileges certain knowledges with legal and philosophical roots in ownership and markets, implies that

(4') Traditional knowledge is marginalized and heritage seeds are criminalized.

This becomes an issue of gender injustice because,

(5') Women are the majority of the traditional seed-keepers and farmers.

Hence,

(6') Women are excluded from the forces of globalization and their productive work undervalued, devalued, or erased from the category of "productive."

Shiva extends this argument from the masculinization of agriculture to globalization. More generally, she argues that globalization causes the destruction of the environment. That destroys the local food production leading to impoverishment of local communities. This, in turn, adversely impacts women and children. Consequently, as globalization increases, women's disadvantage deepens.

IV. Previous Empirical Studies

One strand of Shiva's argument thus points to the hypothesis that globalization lowers women's earnings relative to men's. Previous studies have examined the link between globalization and gender differences in outcomes though these have examined a limited sample or not focused on gender earnings inequality. Papyrakis *et al.* (2012) surveys recent research on trade liberalization (an important component of globalization) and gender income inequality; of 24 econometric studies covered, only one (Oostendorp 2009) examines a global sample (see their tables 1 and 2). The predominant pattern in this literature review is that trade is beneficial for employment but tends to increase the gender wage gap. Below we discuss individual studies more directly relevant to the current project.

Blau and Kahn (1992) examine the gender earnings gap in eight developed countries. The gender earnings gap may be due to differences in education and experience (i.e., a gender

skill level gap) or to discrimination. Translating this into differences between countries, cross country variation in the gender earnings gap may be driven by cross country differences in the gender skill level gap, cross country variation in how labor markets reward skill differentials, and cross country differences in gender discrimination. The authors find a high gender earnings gap in the U.S. even though the gender skill level gap is small. While this pattern seems to point to a relatively high level of gender discrimination in the U.S. labor market, in fact U.S. compensation is very dependent on skill level so the small difference in skills across genders fully explains the higher earnings gap.

Heintz (2006) discusses a range of issues related to globalization, economic policy, and gender differences in employment. In addition to earning less than men in the same employment categories, women are more likely to be employed in footloose industries where mobile capital undermines the bargaining position of labor and hence women's wages. This may cause women's wages to "fall relative to [those of] men as global integration progresses" (Heintz 2006, 28). Heintz also notes the opposite possibility: the export sector may favor relatively lower wage women while having a pay scale sufficiently high that the growth of the export sector reduces the gender earnings gap (Heintz 2006, 52-53). A number of challenges exist for measuring the gender earnings gap. Measurement error is a concern because certain types of work (and wages) may be excluded (e.g., self-employment and informal sector labor). Socioeconomic factors, historical differences, and variation in institutions will simultaneously impact the gender earnings gap.

Oostendorp (2009) examines the link between globalization and labor market outcomes in a large number of countries. His dependent variable is the occupational gender wage gap. This is important but different from gender earnings inequality studied here because the

occupational gender wage gap does not capture compositional effects. That is, the sectoral distribution of female employment may not be uniform. Even with no occupational gender wage gap, women could still earn much less than men if women tend to have jobs in low wage occupations and men tend to have jobs in high wage occupations. Nonetheless, a number of Oostendorp's findings are pertinent: "[T]he occupational gender wage gap tends to decrease with increasing economic development, at least in richer countries, and to decrease with trade and foreign direct investment (FDI) in richer countries, but [this study] finds little evidence that trade and FDI also reduce the occupational gender wage gap in poorer countries" (Oostendorp 2009, 141).

Gray, Kittilson, and Sandholtz (2006) is closest to the current study in country coverage but with a different primary focus (the role of membership in international institutions) and different gender outcome measures (female life expectancy, illiteracy rate, share of the workforce, and share of seats in parliament). They find that the log of openness (trade to GDP) is positively related to female life expectancy (even controlling for male life expectancy) and negatively related to illiteracy (even controlling for male illiteracy) but not significantly linked to female labor force participation or representation in parliament. Because they adopt a panel approach, they "do not explore measures of...female wages, because there are too many missing observations for worldwide analysis during the period studied [1975-2000]" (Gray *et al*. 2006, 302). In a cross-sectional analysis, Gray et al. note that religion is an important explanatory variable.

Thus, while existing empirical studies provides guidance in how to proceed, the link between globalization and gender earnings inequality has not been explored with a wide cross-section of countries.

V. Data and methods

Our dependent variable is *Gender Earnings Inequality*, derived from the ratio of estimated female-male earned income for 2007 (UNDP 2010). Where data for 2007 are not available, the United Nations Development Programme (UNDP) uses the most recent year available between 1996 and 2007. Because this variable is relatively static, use of data from the recent past is unproblematic. Data are available for 173 countries; other data limitations reduce the sample to 160 countries.

The female-male earned income variable is estimated in two respects. First, UNDP applies the female-male wage ratio from the non-agricultural sector (w_f/w_m) to the whole economy because wage data for the agricultural sector are rarely available. Second, when this ratio is not available even for the non-agricultural sector, UNDP assumes a value of 0.75. This assumption is used frequently for developing countries. The exact formula (UNDP, 2008, 361) simplifies to:

$$r = (w_f/w_m) \times (ea_f/ea_m)$$

where r is the female-male earnings ratio, ea_f is the percent of women who are economically active, and ea_m is the percent of men who are economically active. Since $w_f \times ea_f$ is average female earnings and $w_m \times ea_m$ is average male earnings, the equation corresponds to the desired ratio.

The regression analysis uses a simple transformation of this ratio. First since female earned income is less than male earned income (r ranges from 0.16 for Saudi Arabia to 0.90 for Mozambique), $1-r$ is a more natural measure of inequality. Second because of the variable's limited range, we use the log odds transformation:

Gender Earnings Inequality = ln ($[1−r]/r$)

Assuming women's earnings do not exceed men's, the theoretical range of this variable is $−\infty$ to $+\infty$ though the sample range is $−2$ to $+1.7$. Results do not depend heavily on this transformation.

The central explanatory variable is *Globalization*. Because Shiva defines globalization more broadly than just international trade, we use the KOF Index of Globalization (Dreher 2006; Dreher et al. 2008). This ranges from 1 to 100 (rescaled to 0.01 to 1 in our analysis for ease of presentation) and captures economic, social, and political dimensions of globalization. The economic dimension includes trade and investment flows as well as formal and informal barriers to those flows. The social dimension spans personal contacts, data flows, and cultural proximity. The political dimension covers diplomatic ties and involvement in international organizations. This index is used widely in the economics literature.

In empirical analysis of observational data it is important to include other explanatory variables that might reasonably be thought to be correlated with both the dependent variable (*Gender Earnings Inequality*) and the key explanatory variable (*Globalization*). Inclusion of such covariates reduces the possibility of omitted variable bias. Three variables that stand out here are income per capita, civil liberties, and religion.

Since the ground breaking work by Kuznets (1955), innumerable studies have investigated a possible link between income level and income inequality. The Kuznets Curve hypothesizes an "inverted-U" relationship where inequality first rises then falls with development. This notion has been explored in other areas as well, most notably in the context of environmental quality. Thus a link between *GDP per capita* and *Gender Earnings Inequality* is likely. Since economic theory also predicts a positive link between globalization and income, this is an important control variable in the analysis. We use the 2007 purchasing power parity

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GDP per capita (World Bank 2011). Following standard practice in the empirical literature, we use the natural log form to reduce the influence of outliers and facilitate interpretation.[2]

Civil liberties will likely have an impact on *Gender Earnings Inequality* as well as on the KOF Index of Globalization. With greater civil liberties, women will have more freedom to become economically active (higher ea_f) as well as to bargain for equal pay and pursue education to improve their skill set (higher w_f/w_m). Greater civil liberties also allow freer flow of information and exchange of ideas with the outside world, i.e., greater globalization. To capture cross country differences in civil liberties, we use the variable published by Freedom House (2011).

Freedom House's conception of civil liberties is very relevant for the issue of gender inequality. The basic methodology uses a check list with 15 questions related to civil liberties. These fall into four categories: freedom of expression and belief; associational and organizational rights; rule of law; and personal autonomy and individual rights. Based on these categories, Freedom House assigns a rating between 1 (most free) and 7 (least free). The 2010 edition of *Freedom in the World* notes that countries receiving the best rating "allow free economic activity, and tend to strive for equality of opportunity for everyone, including women" (Freedom House, 2011). To make results more intuitive, our *Civil Liberties* variable inverts the rating so that 1 indicates the least civil liberties and 7 indicates the most civil liberties.

Finally as suggested by Gray *et al*. (2006), religion may impact gender equality. We focus specifically on the size of the Muslim population. Islamic traditions tend to reduce the scope of opportunities for education and employment outside the home for women as well as limiting women's economic rights.[3] Islam may also inhibit global financial integration (because of Sharia law) and global cultural exchange, both factors entering into the KOF Index of

Globalization. For these reasons, we also include the Muslim population share (% *Muslim*) from the World Christian Database (2007).

Table 1 provides summary statistics for estimation samples. The full sample covers all 160 countries for which data are available. We also focus on the subset of 121 developing countries.[4]

In the full sample, *Gender Earnings Inequality* averages -0.1798 (female-male earnings ratio of 0.5448) with a low of −2.197 (Mozambique) and high of 1.658 (Saudi Arabia). Mozambique is surprising, corresponding to an earnings ratio of 0.90. A similar figure emerges for Mongolia (0.87). These prove to be outliers and are excluded in some estimates.

Globalization averages 0.58, slightly above the midpoint of the index's range, with a low of 0.26 (Solomon Islands) and a high of 0.93 (Belgium). *Civil Liberties* averages 4.75; several countries rate only a 1 (Libya, Sudan, Turkmenistan, Uzbekistan) and 35 countries receive the highest rating (7). % *Muslim* averages 25%, ranging from 0% (Angola, Costa Rica, Paraguay, Samoa, Tonga, Vanuatu) to 99% (Mauritania). *GDP per capita* averages 8.7 ($6,100) and runs from 5.637 ($280 in Democratic Republic of Congo) to 11.23 ($75,350 in Qatar). The wide range of the raw income figures justifies the log form.

The subset of developing countries differs in a few interesting ways. As one would expect, average *Gender Earnings Inequality* is higher when developed countries are excluded though maximum inequality drops to 1.516 (Pakistan). Mean *Globalization* drops somewhat; the most globalized developing country is Cyprus. Likewise, the average *Civil Liberties* rating falls by half a point. The average % *Muslim* rises to just over 30 percent while mean income falls to 8.2 ($3,700). The maximum value for *GDP per capita* is 10.88 ($53,100 in UAE).

The method used in this paper is multivariate regression analysis. Given data availability

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and limited variation across time for some factors, the analysis is purely cross sectional; there is

no analysis of the dynamics of gender earnings inequality. We use sandwich-type standard error

estimates to construct the t-statistics so that inferences are robust to heteroskedasticity.

VI. Results

Figure 1 provides a useful guide to the analysis. The scatter plot covers all 160 countries.

The horizontal axis is the level of *Globalization*; the vertical axis is *Gender Earnings Inequality*.

The general pattern is illustrated with a quadratic function which shows a rising then falling

relationship between *Globalization* and *Gender Earnings Inequality*, i.e., a Kuznets Curve. The

graph also identifies a number of different country groups. Circles are developing countries

outside of North Africa and the Middle East. Diamonds represent countries in North Africa and

the Middle East, the majority of observations with middling globalization and high inequality.

Squares are developed countries. Finally, open circles identify two outliers, Mozambique and

Mongolia. These are cases where the estimated female-male earnings ratio may be far off. We

re-estimate all specifications excluding these two observations; results reported are robust to this

unless otherwise noted.

Table 2 reports results for the full sample. The first column examines the simple

bivariate relationship between *Gender Earnings Inequality* and *Globalization*. Consistent with

Figure 1, there is no statistically significant linear relationship between the two variables.

Column 2 adds a quadratic term and finds a positive, significant linear term and a negative,

significant squared term. The estimated coefficients imply a maximum *Gender Earnings*

Inequality at a *Globalization* value of 0.57, consistent with the scatter plot.

The remaining columns include additional covariates to see whether the link between

Globalization and *Gender Earnings Inequality* can be explained by some third factor. Column 3 adds *Civil Liberties*. This enters with a negative statistically significant coefficient, demonstrating that countries with more civil liberty exhibit less gender earnings inequality. The persistence of the *Globalization* coefficients means that, even controlling for the level of civil liberty, an inverted-U relationship exists between *Globalization* and *Gender Earnings Inequality*. Column 4 adds *% Muslim*. As expected, a higher share of Muslims is associated with greater *Gender Earnings Inequality*. Once we control for % *Muslim*, *Civil Liberties* is no longer a significant factor. However, the link with *Globalization* is largely unaffected; the coefficients remain significant and roughly the same magnitude. This pattern plays out again with the addition of *GDP per capita* in column 5. *GDP per capita* enters as positive and significant, illustrating that higher income is associated with higher *Gender Earnings Inequality*, *ceteris paribus*.[5]

Things change somewhat when observations from the Middle East and North Africa (MENA) are treated differently. Column 6 introduces an indicator variable, *MENA*, equal to 1 for MENA countries and equal to 0 otherwise. With this method of allowing for the relatively high level of gender inequality in MENA countries, the globalization results drop to marginal statistical significance in column 6; the coefficients on *Globalization* and (*Globalization*)[2] are individually and jointly insignificant in the simplified regression presented in column 7. If we drop the two outliers (Mozambique and Mongolia), the globalization results become significant again. Finally, if we drop all 19 *MENA* countries (not just including the dummy variable), the globalization results are insignificant (with or without Mozambique and Mongolia). This suggests that the link between *Globalization* and *Gender Earnings Inequality* in the overall sample depends to some degree on the pattern in the Middle East and North Africa.

Figure 1 shows that the downward portion of the inverted-U is primarily developed countries. In addition, with Shiva's focus on developing countries, it may be appropriate to limit our analysis to this group. Table 3 presents regression results for developing countries only. As expected, the relationship between *Globalization* and *Gender Earnings Inequality* is no longer quadratic; without the squared term, *Globalization* enters with a significant, positive coefficient in column (1).[6] This indicates that among developing countries, globalization is linked to higher levels of gender earnings inequality. Introducing *Civil Liberties* (column 2) and % *Muslim* (column 3) has little impact on the link to globalization. However, accounting for differences in income (column 4) or being located in *MENA* (columns 5 and 6) dramatically reduces the size of the *Globalization* coefficient so that the estimated coefficient is not statistically different from zero. This pattern casts some doubt on the validity of the empirical link between *Globalization* and *Gender Earnings Inequality* among developing countries.

Overall, these regression results provide some support for the argument that globalization is linked to gender earnings inequality though the relationship is more complex than Shiva suggests. If we consider all countries for which data are available, we find an inverted-U relationship between globalization and gender earnings inequality—a Kuznets Curve of sorts. However, this pattern is largely driven by middling levels of globalization and high levels of inequality in the Middle East and North Africa. Whether a Kuznets Curve exists and these countries just happen to be at this stage of their evolution or MENA countries are simply different (and there is no inherent link between globalization and gender earnings inequality) is an open question that cannot be answered with cross sectional data. If we instead consider developing countries only, the link between globalization and gender earnings inequality is indirect at best. First, we face the same issue with MENA countries. Second when we do

include MENA, higher income explains gender earnings inequality better than does globalization. If globalization is linked to higher income (as economic theory suggests), it is that higher income growth that is correlated with higher gender earnings inequality. This implies that in cases where globalization is not linked to income, gender earnings inequality is not significantly impacted.

VII. Conclusion

Vandana Shiva attacks globalization, developing the argument that this process erodes the natural environment and undermines the social and economic position of women in less developed countries. In this paper, we explore one implication of Shiva's analysis, that gender earnings inequality should be higher in countries that are more integrated into the world economy as measured by an index of globalization. Our empirical analysis is largely shaped by the availability of data that are comparable across countries. The UNDP has compiled data on a large number of countries for 2007 and these data do provide some support for the hypothesis that higher levels of globalization—at least up to a point—are associated with greater disparities between male and female earnings. However, we are limited to discussing a cross section of countries while Shiva's theoretical analysis really provides predictions about the dynamics of gender earnings inequality over time within a given country. If all countries were to follow this path from a common starting point, then the country-specific dynamic predictions map directly into a cross-sectional pattern where countries with higher levels of globalization should also have higher gender earnings inequality. However, if each country has a different starting point, the dynamic model need not yield the cross sectional pattern described. Furthermore, a different dynamic model (where rising globalization is not linked to rising gender earnings inequality)

could generate the pattern.

 With these caveats in mind, we find that across countries gender earnings inequality first rises then falls with the level of globalization (as measured by the KOF Index of Globalization). The rising segment of the curve is driven by developing countries while the subsequent fall is evident only when we include developed countries. This pattern persists when we include a number of other variables—civil liberties, the Muslim population share, and, for the overall sample, per capita income—that one would expect to be linked to gender inequality. This pattern is consistent with previous work, much of it examining individual country case studies (Papyrakis *et al.* 2012). However, the strength of our cross-sectional results depend quite heavily on countries in the Middle East and North Africa which have middling levels of globalization and high levels of gender earnings inequality. Thus an alternative to the hypothesis that gender earnings inequality first rises then falls with globalization is simply that Middle East and North African countries are different. This reflects the classic shortcoming of testing a dynamic theory with cross-sectional data.

 If Shiva's analysis is correct and globalization does exacerbate gender earnings inequality, policy makers may wish to take steps to counterbalance the distributive effects of globalization, implementing measures to offset these effects in tandem with liberalization policies. The core of Shiva's argument could be construed as a shift in property rights away from domestic women and toward multinational corporations. This suggests that one route is to have an explicit policy of strengthening women's property rights as the country opens up to international trade and other elements of the global economy.

[1]Elsewhere, Shiva uses wheat production in India to illustrate these points. Wheat that was formerly grown for local production and processing becomes a commodity according to western accounts of development. The global marketplace imports technology and packaging from the Global North and value becomes tied up with the artificial standards of western, corporatized notions of development. In this process, nature is transformed from a self-regenerating life process to a "resource" for industry.

[2]Including GDP per capita without logs (and with its square as in the standard Kuznets Curve analysis) does not alter results significantly.

[3]This facet of Islam is underscored by Saudi Arabia's aforementioned female-male earnings ratio of 0.16, the lowest in the data.

[4]Designation as developing follows the OECD Development Assistance Committee with the exception that we reclassify Israel, Korea, Qatar, Saudi Arabia, and Singapore as developed. Results are not dependent on this reclassification.

[5]The bivariate relationship between *Gender Earnings Inequality* and *GDP per capita* is also positive but not statistically significant in the overall sample; a quadratic specification (not in logs) is also not statistically significant.

[6]If both are included, *Globalization* and (*Globalization*)^2 are individual insignificant but jointly marginally significant.

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Figure 1

Globalization & Gender Inequality
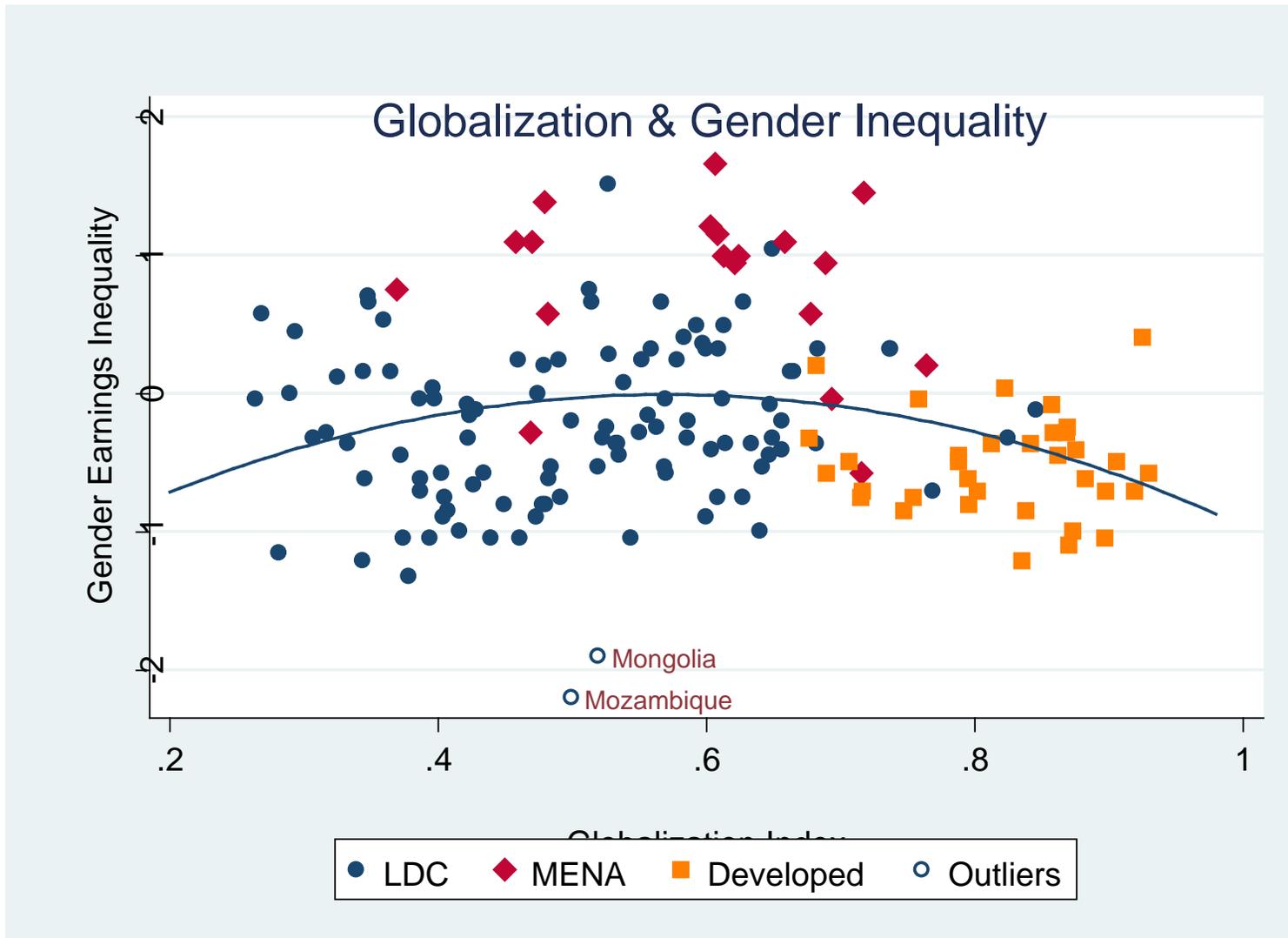
Table 1 – Descriptive Statistics

Variable	Mean	StDev	Min	Max	Description
Full Sample (N=160)					
Gender Earnings Inequality	−0.1798	0.669	−2.197	1.658	log([1−*r*]/*r*); *r*=female-male earnings ratio
Globalization	0.5842	0.1698	0.2635	0.9295	KOF Index of Globalization
Civil Liberties	4.75	1.708	1	7	Freedom House Rating (inverted)
% Muslim	0.2516	0.3522	0	0.9913	Percent of population that is Muslim
GDP per capita	8.716	1.312	5.637	11.23	log of PPP GDP per capita
LDC Sample (N=121)					
Gender Earnings Inequality	−0.1069	0.6921	−2.197	1.516	
Globalization	0.5133	0.123	0.2635	0.8245	
Civil Liberties	4.215	1.479	1	7	
% Muslim	0.3087	0.3728	0	0.9913	
GDP per capita	8.225	1.104	5.637	10.88	

Table 2 – All Countries

Dependent Variable: *Gender Earnings Inequality*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Globalization	−0.253	5.284**	5.173**	4.284**	3.504*	2.396[a]	2.356[b]
	(−0.96)	(2.62)	(2.59)	(2.14)	(1.86)	(1.30)	(1.27)
$(Globalization)^2$		−4.602**	−3.602**	−3.049*	−3.371**	−2.477*[a]	−2.212[b]
		(−2.85)	(−2.30)	(−1.91)	(−2.35)	(−1.74)	(−1.48)
Civil Liberties			−0.162**	−0.0544	−0.0420	−0.0199	
			(−3.47)	(−1.23)	(−1.00)	(−0.50)	
% Muslim				0.826**	0.808**	0.489**	
				(5.07)	(4.99)	(2.49)	
GDP per capita					0.174**	0.119*	
					(2.71)	(1.83)	
Middle East & North Africa						0.643**	1.074**
						(3.10)	(7.45)
Observations	160	160	160	160	160	160	160
R-squared	0.004	0.049	0.141	0.270	0.311	0.364	0.308

t statistics in parentheses based on robust standard errors; ** $p<.05$; [a]test of joint significance: p-value=0.0847; [b]test of joint significance: p-value=0.1022.

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Table 3 – Developing Countries Only

Dependent Variable: *Gender Earnings Inequality*

	(1)	(2)	(3)	(4)	(5)	(6)
Globalization	1.161**	1.878**	1.541**	0.392	0.152	0.448
	(2.61)	(3.53)	(3.25)	(0.62)	(0.26)	(1.13)
Civil Liberties		−0.149**	−0.0402	−0.0253	−0.00793	
		(−3.07)	(−0.86)	(−0.57)	(−0.19)	
% Muslim			0.811**	0.794**	0.514**	
			(5.00)	(4.95)	(2.62)	
GDP per capita				0.173**	0.122*	
				(2.61)	(1.80)	
Middle East & North Africa					0.575**	1.009**
					(2.72)	(6.87)
Observations	126	126	126	126	126	126
R-squared	0.044	0.126	0.267	0.311	0.357	0.293

t statistics in parentheses based on robust standard errors; ** p<.05.