

Globalization, Technology and Female Empowerment: Breaking Rights or Connecting Opportunities?

Elia Elisa Cia Alves¹ · Andrea Quirino Steiner²

Accepted: 18 June 2016 / Published online: 30 June 2016
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Abstract What are the main impacts of globalization and new information and communication technologies (ICTs) on female empowerment? The first part of this paper surveys two main disputing arguments concerning this issue through a review of the literature investigating the causal mechanisms that links both dimensions. One stream of academia highlights the negative impacts of globalization. It argues how market liberalization resulted in the weakening of welfare policies and the flexibilization of labor rights. Another stream of literature emphasizes the role played by international organizations, like the World Bank, as well as civil society movements, and highlights how globalization made it possible for women conquer an important place in their societies. This paper attempts to add to these analyses the assumption that ICTs provided differential opportunities to women. The second part of the paper verifies which arguments are most consistent with empirical data. In a panel analysis from 2000 to 2014 we focus on how globalization may have affected female economic empowerment (measured as women’s participation in the work force) and political representation (measured as women participation on the labor force and participation in national parliaments). We find evidence that access to ICTs may represent a crucial variable to enhance women’s empowerment.

Keywords Female empowerment · Globalization · Information and communication technologies (ICTs) · Panel analysis

✉ Andrea Quirino Steiner
ecodea@gmail.com

¹ Political Science Department, Federal University of Pernambuco, Avenida Acadêmico Hélio Ramos, s/n - 14 andar, Cidade Universitária, Recife, PE 50670-901, Brazil

² Political Science Department, Federal University of Pernambuco, Avenida Acadêmico Hélio Ramos, s/n - 14° andar, Cidade Universitária, Recife, PE 50670-901, Brazil

1 Introduction

Does globalization improve women's empowerment? Tackling this question reveals two views. The first considers that globalization has been a source of more pressures and responsibilities (Braunstein 2008; Wichterich 2009; Rai 2013; Benería et al. 2015), while the second views globalization as a source of several advantages for women (Meyer 2003; Bhagwati 2004; Richards and Gelleny 2007; Fontana et al. 1998; Dutta 2014).

Both trends must be considered when analyzing this process. Thus, the question remains: when balancing the positive and negative effects, are there gains to gender equality for countries that ventured into liberalization? The answer is not straightforward. Globalization and female empowerment are multi-dimensional terms that can embrace several definitions, which makes it difficult to infer linear associations.

Additionally, both terms have been reasonably studied by academics, think tanks, governments, and international and civil society organizations. Consequently, the relationship between both processes, as well as the possible effects that globalization may cause to female empowerment, remain dubious, with publications that strengthen both sides of the argument depending on the sample, the indicators or the analysis techniques employed.

On one hand, existing studies have typically analyzed the effect of general trade openness and foreign direct investment (FDI) on women's empowerment; however, these studies only identify the diffusion of rights, which does not necessarily correspond to the true empowerment of women (Neumayer and Soysa 2011). On the other hand, there are studies that effectively cover material outcomes (Seguino 2006; Benería et al. 2015), as well as the employment ratio of women and the occupational gender wage gap (Oostendorp 2009), yet only emphasizing a few dimensions of globalization.

In short, all of these analyses miss the broader question of whether women have the same opportunities as men to participate in labor markets in the first place. Neither do they consider the potential effect derived from the access to new information and communication technologies (ICTs), a powerful mechanism of empowerment in the globalized world. Here we show that if this dimension of globalization is not considered, negative impacts may prevail over positive ones.

Thus, the central goal of this paper is to investigate the main causal mechanisms through which globalization may affect women's empowerment, measured through market participation and political representation. Although we understand that female empowerment represents a holistic and complex phenomenon, we have chosen those two dimensions as they are more outwardly related to globalization. In addition, as we sought to empirically explain how globalization impacts female empowerment, economy and politics are both aspects for which a fair amount of measurable data is available.

One of the great puzzles behind this paper is to find out how different impacts of globalization reflect on female status. Additionally, we attempt to shed light on a specific dimension of globalization that is rarely taken into consideration when it comes to gender—the dissemination of ICTs—and we explore whether this recent trend may have positively influenced female empowerment.

In order to achieve this, the following section introduces important scholarly literature on the debate of globalization and women's empowerment. Next, empirical data and techniques to analyze this data are discussed in order to test the hypothesis by using two different panel models: one related to economic rights and another related to political rights. The last part presents some of the central findings of this study and proposes a future research agenda.

2 Globalization and Female Economic Empowerment: Positive and Negative Effects

Over the past decades, the liberalization of trade, finance, and investments across the world, especially among developing countries and, boosted by the creation of new ICTs, has opened up new territories both for economic and political actors. However, despite agreeing on its basic meaning—a set of changes in the international system tending to a single world market for goods, services, capital, and labor (Berger 2000), many authors disagree on the most intrinsic processes and political consequences of globalization.

When it comes to the examination of the effects towards strengthening women's empowerment, the divergences tend to increase. Using Held and McGrew's (2007) concepts, globalists are likely to highlight the positive effects of globalization for female empowerment (Sen 1999, Bhagwati 2004), while skeptic authors argue that economic openness increases gender inequality, diminishing women's empowerment.

The literature points to different interpretations to what is actually female empowerment. Women's empowerment and the movement toward gender equality is a modern phenomenon that has been spreading around the world. After World War II, many international treaties focused on promoting human rights. However, as time progressed and considering the indicators that showed the importance of female empowerment for development, governments and private and civil society agents started to give special attention to women's rights and their enforcement. In 2000, the Millennium Development Goals promoted by the United Nations (UN) furthered the campaign for women's rights in areas such as education, health, and poverty.

Although the empowerment of women—understood as ensuring that women are not discriminated and can fully enjoy the same rights as men—is desirable, it is hardly carried through. For that reason, beyond verifying whether countries are adopting policies on gender equality, this part of the paper is concerned with women's economic status.

In general, women's empowerment can be analyzed as rights related to several perspectives of female *status*, which can be allocated among five dimensions: economy, education, governance, health and media (Chung et al. 2013). Because it is a very wide concept, this study will systematically address the economic and political dimensions, as it is understood that globalization strongly affects the economic arena and power distribution. Therefore, we simulate the effect on political representation in order to verify whether this dimension is also impacted by the variables we are interested in.

Our model tests the effect of globalization vectors on women's participation in the labor market and on women's political representation. We chose these variables because there is a fair amount of information available on upper middle and lower middle income countries with comparisons to other variables of interest such as the percentage of firms with female participation in ownership or informal employment. Additionally, female participation in the labor market reflects on social provisions that boost women's bargaining power or autonomy in the household, providing resources such as childcare services, healthcare, sanitation and clean drinking water. All of these support women's provisioning capacities and, ultimately, their empowerment. In addition, although there are controversies on the degree to which women's empowerment can be improved by economic advances, especially concerning personal income, there is a relative consensus that the economic realm plays a significant role (Chung et al. 2013). After all, when women's earnings or employment wage increases, there are positive impacts on women's autonomy and empowerment (Slusser 2009).

The hypothesis tested in this paper emerges from a debate in the literature. The impacts of globalization can be examined by a framework of changes on the autonomy and leverage of the nation-state caused by the growth of interdependence as well as the effects on the economic system (Tzannatos 1999). Braunstein (2008) analyzes this process through the increase of opposing tendencies operating on the policy structures of liberalized economies, especially on social protection, which remains a powerful instrument to women's empowerment. Here, using a similar structure, the arguments are roughly grouped according to each foundation of economic globalization: trade liberalization; the increase of FDIs and financial integration.

The first hypothesis to be tested is that trade liberalization and the increase of FDIs have positive effects on women empowerment. This is grounded in two main aspects. The first positive aspect of trade liberalization and the increase of FDIs is that globalization underlies the increase in women's share of the nonagricultural labor force among developing countries—a result of the tremendous growth in manufacturing trade and export processing. Traditionally, these positions pay higher wages than agricultural ones and require a greater level of training. The assumption is that trade produces growth, and that growth will open up opportunities for better education, more jobs, higher income, more credit and better opportunities for women entrepreneurs. In fact, firms have a role to play in supplying social protection as well. With variations from country to country, a number of social protections are potentially delivered through formal employment, such as minimum wages, maternity leave, and occupational health and safety (Fontana et al. 1998).

Secondly, globalization provides opportunities through trade and investment, as corporations tend to hire the best workers without adhering to traditional social mores that typically privilege men. In addition, there are chances that higher standards and better rights would spillover to laggard countries, because of increased opportunities for employment (Bhagwati 2004; Dutta 2014). Oostendorp (2009) revealed that the occupational gender wage gap tends to decrease with trade and FDI in richer countries, although he finds little evidence that trade and FDI reduce the occupational gender wage gap in poorer countries.

In a cross-national study, Meyer (2003) also found that the effects of economic globalization can be positive for women. She observed that countries with large export economies and a high concentration of commodities had lower levels of occupational gender segregation. From an empirical point of view, Akhter (2005) found that the size of the export economy had a positive effect on women's empowerment; this author used a United Nations' index that includes political participation and decision-making. Studies also find a positive relationship between foreign investment and women's status according to the two UN measures of women's status: the gender empowerment measure and the gender-related development index (Richards and Gelleny 2007).

There is a negative side to this. The associated increase in the demand for female labor is not just a matter of expanding the available labor force when male labor is in short supply: with labor costs being such a crucial part of international competitiveness, labor intensive exporters prefer to hire women because women's wages are typically lower. Critics argue that women shoulder many of the hidden costs behind the economic 'miracle' growth and increases in corporate profits. Wichterich (2009) claims that global patterns of discrimination against women converge with traditional stereotypes. Non-decent work, informal, low-paid and unprotected in terms of social security has become the standard type of 'female' work.

In addition, the international monetary fund's (IMF) study "Women, Work, and the Economy" shows that, despite some improvements, progress toward leveling the playing

field for women has stalled. Subcontracting also plays a negative role, as women are the majority among informal workers (IMF 2013). Gonzales et al. (2015), while arguing that income inequality is intrinsically related to gender inequality, has found that labor market regulations in favor of business is associated with greater income inequality, while having a dampening effect on the income share of the bottom 10 %.

This result is consistent with Dabla-Norris et al. (2015), which found that changes in labor market institutions that reduce workers' bargaining power are associated with the rise of income inequality in advanced economies. Specifically, the decline in unionization is related to the rise of top income shares, while the reduction in minimum wages is correlated with considerable increases in overall income inequality (Benería et al. 2015).

Critics also argue that the bulk of employment growth promoted by globalization has been in low-productivity and low-wage sectors of the informal economy. This would have occurred as a result of the extensive processes of labor flexibilization reforms that have been put in place to meet the generalized demand for more flexible and lower cost labor. With trade and investment liberalization it becomes easier for firms to move abroad in search of lower production costs. As such, globalization may also contribute to suppressing the ability or willingness of firms to be a conduit for social protections¹ (Phillips 2011).

Furthermore, decreasing trade taxes changes the structure of fiscal revenues of the economy, resulting in greater tax burdens in domestic sectors. Additionally, in contrast to Meyer's (2003) work, Akhter (2005) finds that export-led economies, concentrated in few products, tend to have higher rates of gender inequality and are more susceptible to international crises.

A response of wages and employment to trade liberalization has been detected by Milner and Wright (1998) in their study of Mauritius' industry-level data. Initially wages and employment declined following trade liberalization. However, over the long run, they found strong positive effects on wages and employment. This is the case for women working in the apparel industry, for example. The same idea is presented in a report published by the United Nations Development Fund for Women (UNIFEM 2000). It is claimed that trade policies like the North American Free Trade Agreement (NAFTA) have created long-term employment opportunities for women.

Another hypothesis tested by our model is whether financial liberalization boosts female empowerment. There are positive arguments concerning financial liberalization and women's empowerment. According to this perception, globalization implies the increase the activity of multilateral developing banks, which through loan facilities are meant to boost socio-economic activity, whether globally or regionally. As a result, the access to financial markets becomes easier, also due to target credit lines offered by international entities, like the World Bank and other regional development banks.

This perspective is supported by papers that link financial liberalization and micro-credit. In general, beyond credit access those programs also offer project management training for women, in order to guarantee that they will yield good returns. Pitt et al. (2003) found consistent results that women's participation in micro-credit programs helps increase their empowerment. Quoting their words: "credit program participation leads to women taking a greater role in household decision-making, having greater access to financial and economic resources, having greater social networks, having greater bargaining power compared with their husbands, and having greater freedom of mobility. Female credit also

¹ This is very controversial as some argue that women benefit when flexible work arrangements are introduced and the barriers between part-time and full-time work contracts are lowered due to issues around childcare (IMF 2013).

tended to increase spousal communication in general about family planning and parenting concerns” (Pitt et al. 2003, p. 30).

However, several authors question this perspective. Slusser (2009) argues that although in the short run there may be effects to economic growth, in the long run growth is inhibited and inequality increases due to debt dependency. This scenario refers to the dependent relationships that result from capital being borrowed from high-income countries or international organizations, which are mainly controlled by developed countries. When loans cannot be paid back, indebted countries are often forced to take out new loans to refinance old debt and become vulnerable to fall into a “financial trap”, which prevents them from developing their economic and social programs.

Gonzales et al. (2015) also endorses the idea that financial deepening (in the absence of commensurate increases in financial inclusion) has driven inequality in emerging markets and developing countries and amplified gender disparity. One explanation is that higher capital flows, including foreign direct investment, are destined for high-skill and capital-intensive sectors, which also lowers the income share of unskilled workers and exacerbates income inequality. Also in line with previous findings, financial deepening is associated with higher income inequality because credit is often concentrated and financial inclusion does not keep up with deepening.

Consequently, changes in social protection due to financial liberalization are the main drivers of the decrease of female empowerment. Global financial markets can constrain government spending via the menaces of financial outflows. Additionally, spending could result in budget deficits and, ultimately, in crises, considered unsustainable by global financial markets or international financial institutions (Hausmann et al. 2012). Some of these budget constraints result from debt servicing; others are due to conditionalities imposed by international financial institutions like the IMF. In fact, Berger (2000) has highlighted that a lot of the financial pressure comes from global financial institutions, and the globalized private sector, especially transnational and financial corporations.

Some empirical studies (Braunstein 2008; Seguino 2006) endorse this argument by showing that in countries where foreign debt is high women’s relative well-being tends to be lower. In addition, Rao (1999) shows that trade and financial liberalization are positively correlated with “fiscal squeeze”, a consequence of the decline in trade taxes and increases in interest expenses as a proportion of GDP. This is also endorsed by Rai (2013), who critically assesses the gendered impact of structural adjustment policies and the theoretical challenges posed by neoliberal economics that continue to push for greater market openings.

After analyzing all of the points of view concerning globalization and women empowerment, one could imply that the net effects are negative. Nevertheless, analysts forget to observe that globalization may bring increases in the demand for social protections. On one hand, it creates losers as well as winners (Rodrik 1997). On the other, it provides mechanisms of coordination, through which demands for greater empowerment can be arranged.

In fact, conflicting pressures can operate simultaneously: the demand for social protection and the declining capability of governments or willingness of private capital to supply protection as liberalization increases. This sets up a power struggle for institutional change. The outcome depends on the relative power of citizens, workers, firms, the state, the institutional structures in place, and the level of liberalization itself. However, there is a great gap in the political economy literature when analyzing globalization; it ignores the pervasive effects that the spread of technology can have on female empowerment. Hence, it is imperative to consider whether ICTs have improved women’s ability to demand and

achieve real gains among in societies (KIT Royal Tropical Institute, Netherlands and Oxfam 2005).

For this reason, the main goal of this article is to show how such technologies may boost female status regarding globalization spillovers towards gender issues. As pointed out below, the literature suggests the importance of ICTs for increasing the dissemination of female rights (UNESCO 2007). However, there no empirical studies have been published that have investigated the effects of internet use on female access to formal employment and market and political representation. Hence, the main hypothesis to be tested is that access to ICTs has boosted female empowerment.

Information and communication technologies are profoundly affecting social structures all over the world. In particular, ICTs are creating opportunities for women, enabling them to participate in political, social, and economic processes at an unprecedented scale. In an increasingly mobile world, advocacy networks provide transparency and information, creating greater awareness. Because of the recent proliferation of global agreements and advocacy networks, governments desiring “legitimacy and financial capital will want to demonstrate their human rights and democratic credentials” (Htun and Weldon 2010, p. 212).

Shirazi (2012) shows that since the introduction of the internet in Iran, Iranian women have used this medium not only as a means of accessing and disseminating information but also as a means of voicing their concerns about discriminatory laws and to participate in public discourse. Her study finds that women’s digital activities prove to be an effective way of participating in communication discourse and mobilizing the female population of Iran in their struggle for a just and fair society.

Therefore, the global women’s movement plays an important role as it connects groups from different countries, allowing them to learn from each other as well as to monitor the state of women worldwide and exert pressure for improvements (Keck and Sikkink 1998; Melhem and Nidhi 2009). Furthermore, a compelling set of arguments concerns the opportunities and challenges of globalization for women’s mobilization across national borders. Rai (2013) argues that the common grievances caused by globalization have indeed stimulated unprecedented collaboration among women’s civil society groups.

More globalized countries are likely to be more vulnerable to such pressures, particularly from global advocacy networks that name and shame governments and multinational corporations (Benería et al. 2015). Additionally, there is strong evidence that relates technological globalization to women’s empowerment, either through new jobs and entrepreneurship opportunities or thorough education. Firstly, economic opportunities through ICTs can change the position of women within their families and workplace and give them better choices for their livelihood (Ng and Mitter 2005). Secondly, women’s use of ICTs has a strong impact on their participation in the knowledge society—from e-banking in order to safely secure family income to connecting to medical experts for health-care advice. Thirdly, a similar cultural shift can be seen in the adoption of distance learning methods by established universities, which can spread opportunities and access to quality education, including free tools such as coursera.org (Moolman et al. 2007).

This is not a straightforward solution. Melhem and Nidhi (2009) have shown that access to education continues to be a greater barrier for women than men; an estimated two thirds of the world’s illiterate population is made up of women. This fact may be an obstacle in accessing ICTs, as illiterate women may not be able to take advantage from ICT access. Therefore, social and cultural factors may limit women’s access to shared benefits from ICTs, preventing them from developing skills to use internet. In addition, since women and girls often do not control home finances, they may lack the financial resources to purchase

the vehicles to access the internet. In addition, for most women, significant gains in education have not translated into better labor market outcomes (UNWomen 2015).

Furthermore, education in science and technology is still considered a male domain in many cultures. In addition, it is impossible to ignore the increased demand for more advanced skills, as the technology in the ICT sector rapidly changes, which means that workers must continually upgrade their skills. This is specifically difficult for women that carry out multiple roles.

Investigating the impact of globalization on political empowerment is also a variable of interest as politics is another important tranche of female empowerment. Increased female representation in governmental institutions and decision-making bodies is crucial for the overall empowerment of women. Without female officers in government, women's voice in shaping their own economic and social destiny is reduced. Therefore, this variable is intrinsically related to female empowerment as the state can influence the status of women through government spending and by guaranteeing women's rights, for instance. Consequently, a greater proportion of women heading parliaments' seats increases the probability that women will be targeted by gender equity policies.

The literature suggests several mechanisms through which globalization may affect women's political participation. The first mechanism is through international organizations. This has been a source of pressures and compromises on the improvement of women's status. The goal of gender equality has been included in many international agreements—including the Millennium Development Goals—and several international organizations and groups began to demand greater political representation. Dahlerup (2004) shows that, since 1980, more than half of the countries in the world have implemented some type of political gender related quota.

We also note that with the diffusion of ICTs women have been able to articulate themselves politically as well as to take initiatives regarding their involvement in policies (Melhem and Nidhi 2009). In this case, modern technology applications may help to widen the scope of voting when making decisions to draw new policies rely on electronic consultations and conferences, for example. Melhem and Nidhi (2009) cite several cases in Peru, South Asia, Lithuania and India where access to information and knowledge in rural areas promoted positive impacts on women's social and political participation.

3 Data and Empirical Analysis

Based on the arguments discussed previously, this section will empirically verify some of the main ideas relating to globalization, technology and female empowerment. Some of the theories were transformed into hypotheses, which were then tested in panel models in order to amplify the number of observations analyzed. The choice of which specifications should be tested was based on data availability and backed by studies on data quality (Hsiao 2003).

To analyze our research question we employ a panel, or longitudinal, data technique, which consists in analyzing a data set that follows a given sample of individuals over time, and thus provides multiple observations on each individual in the sample. This kind of technique offers a series of advantages over cross-section analyzes. It usually gives the researcher a large number of data points, which increases the degrees of freedom and reduces the collinearity among explanatory variables. This, in turn, improves the efficiency of econometric estimates. More importantly, longitudinal data allows the researcher to

analyze a number of important economic questions that cannot be addressed using cross-sectional or time-series data sets. And last, but not least, it provides a means of resolving the magnitude of econometric problems that often arises in empirical studies, namely the often heard assertion that the real reason one finds certain effects is the presence of omitted (mismeasured or unobserved) variables that are correlated with explanatory variables. Therefore, it improves estimation accuracy and controls for unobserved heterogeneity. In sum, the power of this kind of analysis derives from its theoretical ability to isolate the effects of specific actions, treatments, or more general policies (Hsiao 2003; Cameron and Trivedi 2005, 2009).

Three different estimates were used to check the effect of the variables of interest. Our first estimate used a pooled regression model (POLS).² We then used the random effects model (RE),³ and finally the fixed effects model (FE), which allows for consistent estimation of the coefficients of interest even in the presence of unobservable idiosyncratic heterogeneity correlated with other regressors. Such models take out all of the in between variation in the data and are estimated based on the within variation of the data in each observational unit only. This reduces bias because the unobserved heterogeneity is fully captured by the fixed effects. Thus, it considers different intercepts for individuals, assuming that the inclinations and variance are constant. The unobservable idiosyncratic heterogeneity, α_i , is no longer dealt as a random variable but as a parameter to be estimated.

Therefore, unlike random effects, the fixed effects model allows for consistent estimation even in the presence of ci correlated with the regressors (Wooldridge 2002). The next step was to check which model was the most suitable for our data in order to maximize the efficiency and the consistency of the coefficients.⁴

In order to control for income effects, we split the sample of developing countries in lower middle income and upper middle income countries. Therefore, two different samples were analyzed containing only country level information since the variables analyzed—such as trade openness—only make sense at this level of analysis. The first one considers only upper middle income countries (39 countries), while the other considers lower middle income countries⁵ (32), between 2000 and 2014. All of the countries considered are listed in Appendix 1. The choice to analyze the income effect through different samples and not

² In the basic POLS model, the estimator considers all the information as cross-section units, ignoring the temporal aspect of the data. Despite the method being frequently used, there is a problem related to the validity of the hypotheses as there is no important information about the idiosyncratic heterogeneity and they are not correlated with any explanatory variables.

³ The random effects model deals with the unobservable idiosyncratic heterogeneity (ci) as a random variable that is distributed regardless of the regressors. The ci becomes part of the error and, therefore, cannot be correlated with any regressor in any period.

⁴ We carried out two tests to elucidate the consistent estimators and, among those, which one is the most efficient. In this case, there is unobserved idiosyncratic heterogeneity that is not correlated with any regressor, the fixed and random effects estimators are consistent, the latter being more efficient. If the heterogeneity is correlated with a regressor, the former is the only one that is consistent. In this fashion, we used the Breusch-Pagan Test to check the presence of idiosyncratic heterogeneity by analyzing the existence of self-correlation on the unobservable heterogeneity and the Hausman Test to check the correlation between the idiosyncratic heterogeneity and the regressors.

⁵ According to the World Bank, low-income economies are defined as those with a GNI per capita, calculated using the *World Bank Atlas* method, of \$1045 or less in 2013; middle-income economies are those with a GNI per capita of >\$1045 but <\$12,746; high-income economies are those with a GNI per capita of \$12,746 or more. Lower-middle-income and upper-middle-income economies are separated at a GNI per capita of \$4125. Note that low- and middle-income economies are sometimes referred to as developing economies. The term is used for convenience; it is not intended to imply that all economies in the

applying income as an independent variable is to refine what was done previously by other authors who have analyzed separately low income and middle income countries (Neumayer and Soysa 2011). Additionally, we understand that we must be cautious regarding cross-country analysis, as that different outcomes are related to the structure of the economy being considered (e.g., industrialized; semi-industrialized; agricultural; degree of openness to world economy, etc.).

Here, as we are more interested in capturing the effects of ICTs, it does not seem reasonable to focus on low-income countries as in such units other variables may seem more important to women empowerment than the effect of internet access. Neither did we find it interesting to investigate the effects to developed countries since internet access, for example, seems to be very wide and may not be able to explain much of gender inequality. In Appendix 1 we listed all countries that were analyzed.

All datasets are strongly balanced⁶; consequently, it was possible to apply panel analysis without causing inconsistency of the estimators. The first hypothesis tested refers to the growth of female participation on the total labor force boosted by economic liberalization and the increase of women's internet access. The dependent variable is measured by women's participation in the labor force rate, estimated by the ILO (International Labour Organization's Key Indicators of the Labour Market database). Labor force participation rate is the proportion of the population aged 15 and older that is economically active: all people who supply labor for the production of goods and services during a specified period. Akhter (2005) points that potential problems with cross-national data on women labor force are bias and misclassification, either with under or overestimation. However, since ILO's estimates have been derived from simple random sampling from well defined populations, it is possible to employ it in terms we are doing here.

According to Table 1, the models include five independent variables. The political and economic data was collected from the World Bank and Polity IV⁷ databases and the data on percentage of individuals using the Internet was provided by ITU (International Telecommunication Union, a UN agency). Although the literature suggests that egalitarian countries tend to have a more balanced female to male labor force participation rate, this could not be tested due to the lack of data. The impact of the labor force with secondary education also could not be tested due to the same reason. In terms of resource equity, the literature shows an overall positive relationship with gender equality and, in sum, attributes this correlation with the following: better livelihoods allow women to become more independent or even overcome spousal resistance and gain greater ability to make household decisions by the power to bargain (Horowitz 2009). However, the lack of data for resource equity also made it impracticable to test this.

All of the definitions and descriptive statistics of each variable included in the model are provided in Tables 1, 2, and 3, respectively.

The basic equation used for estimation can be summarized as follows:

Footnote 5 continued

group are experiencing similar development or that other economies have reached a preferred or final stage of development.

⁶ According to Hsiao (2003), a panel is said to be balanced if we have the same time periods, $t = 1, \dots, T$, for each cross section observation. For an unbalanced panel, the time dimension, denoted T_i , is specific to each individual.

⁷ Codings on a 21-point scale from -10 (most autocratic as hereditary monarchy) to $+10$ (consolidated democracy) are based on expert evaluations of the political regime in countries, relying on a fairly comprehensive definition of democracy, which includes electoral rules and various measures of the openness of political institutions and aspects of institutionalized democracy and autocracy.

Table 1 Description of the variables

Wlaborforce	Women participation in the labor force rate
Prop_wparli	Proportion of seats head by women in national parliaments
Internet rate	Percentage of individuals using the internet
TradeofGDP	Sum of exports and imports of goods and services measured as a share of gross domestic product
Net_FDI	Net inflows of foreign direct investments
Foreign_debt	All external debt stocks, as a percentage of gross national income (% of GNI)
Pol_regime	Score of polity IV for each country each year

Table 2 Descriptive statistics—upper middle income countries

Variable	Obs	Mean	SD	Min	Max
<i>Continuous variables</i>					
Wlaborforce	537	37.72	9.44	13.25	49.39
Prop_wparli	508	16.87	10.50	0.00	48.90
Internet rate	533	20.15	17.13	0.10	72.64
TradeofGDP	514	86.16	38.23	18.04	220.41
Net_FDI	516	4.47	6.04	-16.59	50.97
Foreign_debt	467	45.78	32.28	1.47	198.07
<i>Discrete variables</i>					
Pol_regime	456	3.70	6.08	-9	10

Table 3 Descriptive statistics—lower middle income countries

Variable	Obs	Mean	SD	Min	Max
<i>Continuous variables</i>					
Wlaborforce	434	38.18	8.83	14.73	50.04
Prop_wparli	421	13.48	7.81	0.60	42.70
Internet rate	431	9.93	11.32	0.00	56.00
TradeofGDP	421	84.73	37.37	24.19	209.89
Net_FDI	423	4.31	5.07	-2.76	53.81
Foreign_debt	416	56.98	39.99	2.06	237.67
<i>Discrete variables</i>					
Pol_regime	362	4.54	5.24	-10	10

$$\begin{aligned}
 \text{wlaborforce}_{it} = & \alpha + c_i + \beta_1 \text{TradeofGDP}_{it} + \beta_2 \text{pol_regime}_{it} \\
 & + \beta_3 \text{net_FDI}_{it} + \beta_4 \text{internet_rate}_{it} + \beta_5 \text{foreign_debt}_{it} + \varepsilon_{it}
 \end{aligned}
 \tag{1}$$

$$E(\varepsilon_{it} / \mathbf{X}_{is}, c_i) = 0; \text{ for } t \forall t s$$

$$\varepsilon_{it} \sim \text{IID} (0, \sigma^2)$$

where i refers to the country, t to the year, and α , c_i and ε_{it} are, the constant, idiosyncratic heterogeneity and the error term, respectively; *TradeofGDP*, *pol_regime*, *net_FDI*, *internet_rate*, *foreign_debt* are the independent variables of interest and *wlaborforce* the dependent one. The *wlaborforce* indicates the participation of women in total labor force

for each country, each year. The second model will use as a dependent variable the proportion of women at parliament seats, and the same independent variables.

TradeofGDP is the sum of exports and imports of goods and services measured as a share of gross domestic product. The variable *pol_regime* is the score of Polity IV for each country each year. As mentioned previously, the Polity IV project offers the most widely used database among all democracy indicators; it is expected that in more democratic societies women have a voice as voters, which is likely to be translated into better rights for women. Therefore, we expect that measures of the State, in this case as democratic regimes should increase women's status. The *net_FDI* are net inflows of foreign direct investments; *internet_rate* measures the percentage of individuals using the Internet and *foreign_debt* measures all external debt stocks, as a percentage of Gross National Income (% of GNI). Similarly to Oostendorp (2009), most indicators are measured as a percentage of GDP.

4 Results

In this section, we present the main results of our research design. Several versions of Eq. 1 were tested in order to obtain a model, which yielded robust results, and best fit the data distribution. First, we examined the impact of economic liberalization on women participation on labor force using all models for static panel data. Those are the POLS, RE and FE models. Table 4 includes all of the variables of the model for two different model estimations. To decide upon the most appropriate estimation method the Breusch-Pagan Test was applied at each different model specification. The result was the rejection of the null hypothesis of the absence of serial correlation in the compound error ($v_{it} = c_i + \varepsilon_{it}$). The Hausman Test of all specifications do not reject H_0 ; therefore both RE and FE methods are consistent, and the former is more efficient. Hence, the POLS model was not consistent, although the other ones were.

The main conclusion we can draw from Table 4 is that women's participation in the labor force in upper middle income countries was positively impacted by greater internet access and foreign direct investment flows. It could be because in middle income countries women have better education and skill; hence investments are being directed towards those countries. However, although we are not claiming causality, the results corroborate the theoretical insights on the strong relationship between the variables that are been analyzed. As expected by the main theories presented above, external debt has a negative relation to women participation in the labor force. The other variables were not significant, although trade appeared to have a small but negative effect in some cases, suggesting that some of the arguments presented above could have an empirical background.

Considering the same model applied to lower middle income countries the results were quite different, suggesting that globalization may have diverse effects depending on income. Here, trade and democracy appear to have a significant positive effect on women's participation in the labor force. Again, external debt has a negative effect on this variable, which reinforces the argument of vulnerability of indebted countries concerning the most different areas.

Now we turn to the results of the panel analysis where we measure female political empowerment studying how the proportion of seats head by women in national parliaments behaves in face of globalization inputs. As it can be seen on Figs. 1 and 2, many governments still lack meaningful female participation, despite the slight increase of women political participation in most upper and lower middle income countries between 2000 and

Table 4 Panel models for women's participation in the labor force

	Upper middle income countries					Lower middle income countries						
	(POLS)	(RE-rob)	(FE-rob)	(POLS)	(RE)	(FE)	(POLS)	(RE-rob)	(FE-rob)	(POLS)	(RE)	(FE)
TradeofGDP	0.005	-0.001	-0.001	0.008	-0.004	-0.004	0.08**	0.009	0.008	0.08**	0.01**	0.01**
Pol_regime	0.030	0.009	0.009	0.027	0.004	0.005	0.038	0.012	0.012	0.038	0.005	0.005
Net_FDI	0.269	0.048	0.046	0.208	0.036	0.036	0.1633	0.219**	0.218**	0.164	0.2***	0.199***
Internet_rate	0.305	0.046	0.046	0.319	0.029	0.029	0.288	0.097	0.098	0.291	0.035	0.036
Foreign_debt	0.043	0.017	0.016	0.044	0.015*	0.015*	0.2143	-0.0179	-0.0185	0.2098	-0.0172	-0.0179
	0.158	0.016	0.016	0.141	0.009	0.009	0.158	0.0125	0.0124	0.154	0.017	0.017
	0.029	0.03***	0.03***	0.037	0.03***	0.03***	-0.011	0.0057	0.0058	-0.0086	0.003	0.003
	0.050	0.009	0.003	0.052	0.003	0.003	0.069	0.017	0.017	0.07	0.006	0.006
				-0.038	-0.01***	-0.01***				0.0032	-0.006**	-0.005**
				0.052	0.003	0.003				0.027	0.0023	0.0024
Constant	36.60***	37.41***	38.22***	38.27***	39.05***	39.05***	31.78***	37.67***	38.12***	31.64***	37.9***	38.33***
Observations	3.75	1.89	0.76	4.27	0.8703	0.8703	4.40	1.92	1.03	4.32	1.624	0.441
R ²	411		378		330		330		330			
Breusch Pagan test	0.037		0.031		0.19		0.19		0.20			
p value	2166.7		2126.5		1629.5		1629.5		1620.6			
Hausman test	0.000		0.000		0.000		0.000		0.000			
p value	0.92		0.88		0.971		2.28		3.91			
	0.9214		0.971		0.685		0.685		0.562			

* Significant at 10 %, ** Significant at 5 %; Significant at 1 %. Standard errors are below the values of the parameters
 Bold values are significant scores at 1 %, 5 % or 10 %

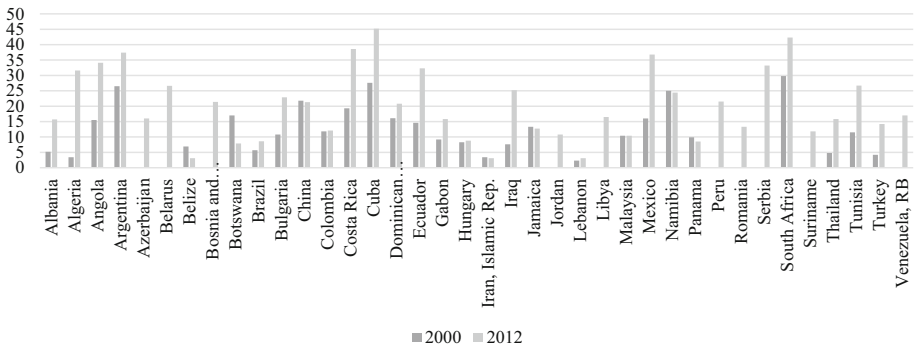


Fig. 1 Proportion of seats held by women in national parliaments in upper middle income countries (%). Source World Bank (2015)

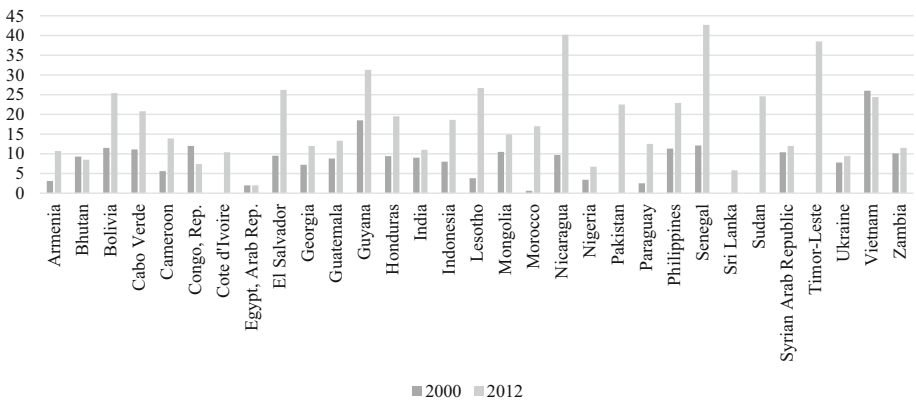


Fig. 2 Proportion of seats held by women in national parliaments in lower middle income countries (%). Source World Bank (2015)

2012. Women are still underrepresented in all aspects of government on an international scale. According to the Gender Gap Report (2014), the gap between men and women's political power is closing very slowly over time and there is still a lot of diversity among countries. Additionally, the number of women in the decision-making structures of the major international organizations, such as the International Monetary Fund, the World Trade Organization and the World Bank is also <10 % in average (UNIFEM 2002, 2005).

The main conclusion we can draw from Table 5 is that, once more, the percentage of individuals using the internet and foreign debt appear to influence women participation in upper and lower middle income countries. As expected, this confirms that political representation is more influenced by new information and communication technologies than other economic variables related to globalization. It is also important to highlight that foreign debt once again appears as a driver to decrease female empowerment in political terms. Interestingly, the political regime did not appear as a significant variable to explain the proportion of seats held by women. Although we still do not have an answer to this fact, we found it worth mentioning.

Table 5 Panel models for the proportion of seats held by women in national parliaments (%)

	Upper middle income countries		Lower middle income countries	
	(RE)	(FE)	(RE)	(FE)
TradeofGDP	-0.024	-0.015	0.0042	-0.0118
	0.021	0.024	0.0184	0.0217
Pol_regime	0.092	0.137	0.011	0.0387
	0.160	0.188	0.127	0.147
Net_FDI	-0.008	-0.009	0.0419	0.0480
	0.048	0.049	0.0659	0.0668
Internet_rate	0.171***	0.17***	0.192***	0.196***
	0.017	0.018	0.025	0.025
Foreign_debt	-0.066***	-0.066***	-0.04***	-0.04***
	0.013	0.012	0.0093	0.0095
Constant	17.54***	16.904***	13.29***	14.16***
	2.57	2.23	1.98	1.78
Observations	360		321	
Hausman test	3.29		5.65	
<i>p</i> value	0.655		0.342	

* Significant at 10 %; ** Significant at 5 %; Significant at 1 %. Standard errors are below the values of the parameters

Bold values are significant scores at 1 %, 5 % or 10 %

5 Final Considerations

This paper aimed to raise the main perspectives and causal mechanisms that link globalization and female empowerment in economic and in political terms. In addition, we wanted to verify these theories empirically in relation to developing countries. In general, globalization has strengthened women's empowerment. Their participation in market economy and in the political arena has also been fostered by the tide of globalization. However, this development has been uneven, either between countries or among socio-economic groups within the same country. Consequently, capturing the net effects of this process is a complex task.

In summary, our models were able to capture the importance of the new information and communication technologies. Usually this variable is analyzed in separate models, but here we could show that internet access, for example, may be one of the positive impacts of globalization. This is especially true in upper middle income countries, but also in lower middle income countries when we consider political representation.

However, in the case of lower middle income countries, democracy and other civil rights seem to be more important to women's empowerment than internet access. In addition, trade openness and democratization appear to be more relevant than foreign direct investment and internet access in those countries. This suggests that internet promotion policies at lower middle income countries are less relevant, in terms of economic aspects, than the dissemination of political rights, for example.

Yet, our results corroborate theories which reveal the importance of countries' investment on the access to new technologies of information and communication along with the concern about attracting foreign direct investments in upper middle income countries. It is

worth mentioning, however, that nations worldwide have different levels of access to information and communication technology, and increased availability of information does not necessarily link to increased gender equality. In addition, in many cases, women do not enjoy equal access to this technology and information. Therefore, internet access may become only significant when it comes with the decrease of digital divide. As stated earlier, in comparison to men, the female population is still far from attaining widespread digital literacy. Hence, related policies should be followed by special attention to this public.

Improving the ability of using the Internet is only a part of a wider general discussion, which concentrates on the specific challenges of human development that women face compared to men. These obstacles vary from fewer opportunities to earn income, education and training, to gender roles' distribution and women's limited participation in decision-making, which negatively affects empowerment.

Lastly, the model also corroborates critical views concerning financial globalization and the increase of external debt. Globalization has transformed the national economic policy environment. Governments have opened up their markets for goods, services and capital to the international economy. The result of the liberalization of international capital markets has been an increase in volatility and economic instability and new constraints on the extent to which policies can be employed to promote social justice. Our results indicate that such policies have direct impact on female participation in the labor force and in political representation, which should shed light on the risks involved in increasing financial liberalization.

Despite our results, we cannot ignore possible the limitations of modeling. The main one is that the models estimated do not consider traditional factors that may explain women's participation in the labor force and in political representation. Those may be either pre-determined, endogenous, or both, as current period rates could depend on values in the past. One possibility would be to apply dynamic variations of the same specification. This could be a future improvement on the specification presented here.

In conclusion, the policy implications of the analysis are twofold. First, while some aspects of globalization improve specific dimensions of gender inequality, it makes it more difficult to tackle other dimensions at a global level. Consequently, more concentrated efforts are needed to develop a coordinated framework at the international and national levels that may boost the positive impacts and diminish the negative effects of globalization.

Acknowledgments This study was supported by the PSA under a Grant for Exchange Students for the PSA 65th Annual Conference; by the ABCP, for participation in the same conference; by the FACEPE under Grant IBPG-0671-7.09/12.

Appendix 1

See Table 6.

Table 6 List of countries

Upper middle income countries	Lower middle income countries
Albania	Armenia
Algeria	Bhutan
Angola	Bolivia
Argentina	Cabo Verde
Azerbaijan	Cameroon
Belarus	Congo, Rep.
Belize	Cote d'Ivoire
Bosnia and Herzegovina	Egypt, Arab Rep.
Botswana	El Salvador
Brazil	Georgia
Bulgaria	Ghana
China	Guatemala
Colombia	Guyana
Costa Rica	Honduras
Cuba	India
Dominican Republic	Indonesia
Ecuador	Lesotho
Fiji	Mongolia
Gabon	Morocco
Hungary	Nicaragua
Iran, Islamic Rep.	Nigeria
Iraq	Pakistan
Jamaica	Paraguay
Jordan	Philippines
Lebanon	Senegal
Libya	Sri Lanka
Malaysia	Sudan
Mexico	Syrian Arab Republic
Namibia	Timor-Leste
Panama	Ukraine
Peru	Vietnam
Romania	Zambia
Serbia	
South Africa	
Suriname	
Thailand	
Tunisia	
Turkey	
Venezuela, RB	

References

Akhter, R. (2005) *Global economy, gender inequality, and domestic violence: A cross-national study*. Paper presented at American Society of Criminology, Toronto, Canada.

- Benería, L., Berik, G., & Floro, M. (2015). *Gender, development and globalization: Economics as if all people mattered* (2nd ed.). New York: Routledge.
- Berger, S. (2000). Globalization and politics. *Annual Review of Political Science*, 3, 43–62.
- Bhagwati, J. (2004). *In defense of globalization*. Princeton: Princeton University.
- Braunstein, E. (2008). *Women's employment, empowerment and globalization: An economic perspective. EC/WSRWD/2008/EP.3*. New York: United Nations.
- Cameron, A. C., & Trivedi, P. K. (2005). *Microeconometrics: Methods and applications*. New York: Cambridge University Press.
- Cameron, A. C., & Trivedi, P. K. (2009). *Microeconometrics using stata*. College Station, TX: Stata Press.
- Chung, B., Kantachote, K., Mallick, A., Polster, R., Roets, K. (2013). Indicators of women's empowerment in developing nations. Workshop in international public affairs, Spring 2013. La Follette School of Public Affairs.
- Dabla-Norris, M. E., Kochhar, M. K., Suphaphiphat, M. N., Ricka M. F., & Tsounta. E. (2015). Causes and consequences of income inequality: A global perspective. International Monetary Fund.
- Dahlerup, D. (2004). *No quota fever in Europe? The implementation of quotas: European experiences*. Department of Political Science, Stockholm University, Sweden. Paper presented at the International Institute for Democracy and Electoral Assistance (IDEA)/CEE Network for Gender Issues Conference (pp. 1–7).
- Dutta, M. (2014). Has globalization increased women empowerment? Available at SSRN 2542490.
- Fontana, M., Joekes, S., & Masika, R. (1998). *Global trade expansion and liberalization: Gender issues and impacts. A study prepared for the Department for International Development (DFID)*. Brighton: University of Sussex, Institute of Development Studies.
- Gonzales, C., Jain-Chandra, S., Kochhar, K., Newiak, M., & Zeinullayev, T. (2015). *Catalyst for change: Empowering women and tackling income inequality*. Washington: FMI.
- Hausmann, R., Tyson, L. D., Zahidi, S. (2012). The global gender gap report 2012. Geneva: World Economic Forum. http://www3.weforum.org/docs/WEF_GenderGap_Report_2012.pdf.
- Held, D., & McGrew, A. (2007). *Globalization/anti-globalization: Beyond the great divide* (2nd ed.). Cambridge: Polity Press.
- Horowitz, L. (2009). *Getting good government for women: A literature review. Agriculture and Rural Development Discussion Paper 43*. World Bank, Agricultural and Rural Development, Washington D.C.
- Hsiao, C. (2003). *Analysis of panel data* (2nd ed.). Cambridge: Cambridge University Press.
- Htun, M., & Weldon, S. L. (2010). When do governments promote women's rights? A framework for the comparative analysis of sex equity policy. *Perspectives on Politics*, 8(1), 207–216.
- International Monetary Fund. (2013). Women, work, and the economy: Macroeconomic gains from gender equity. *IMF Staff Discussion Note*, September 2013 SDN/13/10.
- Keck, M. E., & Sikkink, K. (1998). *Activists beyond borders: Advocacy networks in international politics*. Ithaca, NY: Cornell University Press.
- KIT Royal Tropical Institute, Netherlands and Oxfam. (2005). Gender and ICTs for development: a global sourcebook: A collection of case studies on how ICT has influenced women in developing countries, UK.
- Melhem, S., & Nidhi, T. (2009). Information and communication technologies for women's socio-economic empowerment. In C. Morrell (Ed.), *World bank working paper, n. 176*. Washington, DC: The International Bank for Reconstruction and Development. The World Bank.
- Meyer, L. B. (2003). Economic globalization and women's status in the labor market: A cross-national investigation of occupational sex segregation and inequality. *The Sociological Quarterly*, 44, 351–383.
- Milner, C., & Wright, P. (1998). Modelling labour market adjustment to trade liberalization in an industrializing economy. *Economic Journal*, 108, 509–528.
- Moolman, J., Primo, N., & Shackleton, S. (2007). Taking a byte of technology: Women and ICTs. *Agenda Feminist Media*, 21(71), 4–14.
- Neumayer, E., & Soysa, I. (2011). Globalization and the empowerment of women: An analysis of spatial dependence via trade and foreign direct investment. *World Development*, 39(7), 1065–1075.
- Ng, C., & Mitter, S. (Eds.). (2005). *Gender and the digital economy: Perspectives from the developing world*. New Delhi: Sage Publications.
- Oostendorp, R. H. (2009). Globalization and the gender wage gap. *World Bank Economic Review*, 23(1), 141–161.
- Phillips, N. (2011). Poverty reduction and the role of regional institutions. In G. Mace, A. F. Cooper, & T. M. Shaw (Eds.), *Inter-american cooperation at a crossroads*. Basingstoke/New York: Palgrave.
- Pitt, M. M., Khandker, S. R., & Cartwright, J. (2003). *Does micro-credit empower women? Evidence from Bangladesh*. World Bank Policy Research Working Paper, 2998.

- Rai, S. M. (2013). *Gender and the political economy of development: From nationalism to globalization*. Malden: Wiley.
- Rao, M. (1999). *Globalization and the fiscal autonomy of the state. Background paper for the Human Development Report*. New York: UNDP.
- Richards, D. L., & Gelleny, R. (2007). Women's status and economic globalization. *International Studies Quarterly*, 51, 855–876.
- Rodrik, D. (1997). *Has international economic integration gone too far?* Washington, DC: Institute for International Economics.
- Seguino, S. (2006). The great equalizer? Globalization effects on gender equality in Latin America and the Caribbean. In A. Shaikh (Ed.), *Globalization and the myth of free trade* (pp. 177–214). London: Routledge.
- Sen, A. (1999). *Development as freedom*. New York: Alfred A. Knopf.
- Shirazi, F. (2012). Information and communication technology and women empowerment in Iran. *Telematics and Informatics*, 29(1), 45–55.
- Slusser, S. (2009). Gender empowerment and gender inequality, the global economy and the state: Exploring the relationship between economic dependency, the political order, and women's status. Ph.D. dissertation, University of Akron. <http://etd.ohiolink.edu/view.cgi/Slusser%20Suzanne%20R.pdf?akron1240510508>.
- Tzannatos, Z. (1999). Women and labor market changes in the global economy: Growth helps, inequalities hurt and public policy matters. *World Development*, 27(3), 551–569.
- UNESCO. (2007). *Science, technology and gender: An international report*. Paris: United Nations Educational, Scientific and Cultural Organization.
- UNIFEM. (2002). Women challenging globalization: A gender perspective on the United Nations international conference on financing for development, 18–22 Mar 2002, Monterrey, Mexico.
- United Nations Development Fund for Women (UNIFEM). (2000). *NAFTA's impact on the female work force in Mexico*. Mexico City: UNIFEM.
- United Nations Development Fund for Women (UNIFEM). (2005). *Progress of the world's women 2005: Women, work and poverty*. New York, NY: UNIFEM.
- UNWOMEN. (2015). Entity for gender equality and the empowerment of women. Progress of the world's women 2015–2016: transforming economies, realizing rights, <http://www.refworld.org/docid/558bb7974.html>.
- Wichterich, C. (2009). Trade-A driving force for jobs and women's empowerment? Focus on China and India. *World Development*, 28, 1211–1230.
- Wooldridge, J. M. (2002). *Econometric analysis of cross section and panel data*. Cambridge: The MIT Press.