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DOES ICTs MATTER IN WOMEN'S POLITICAL EMPOWERMENT?

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Abstract

This paper examines the effect of ICTs on women's political empowerment in 161 developed and developing countries from 1992 to 2017. Using panel OLS method, we find that women's political empowerment gets increased with the dissemination of ICTs. This effect passes through the improvement of governance, economic globalization, and communication. To explain these results, we highlight the role of ICT in improving good governance, economic globalization, and enhanced communication, which in turn contribute to women's political empowerment.

Keywords: ICT, Women's political empowerment, Developed countries, Governance

INTRODUCTION

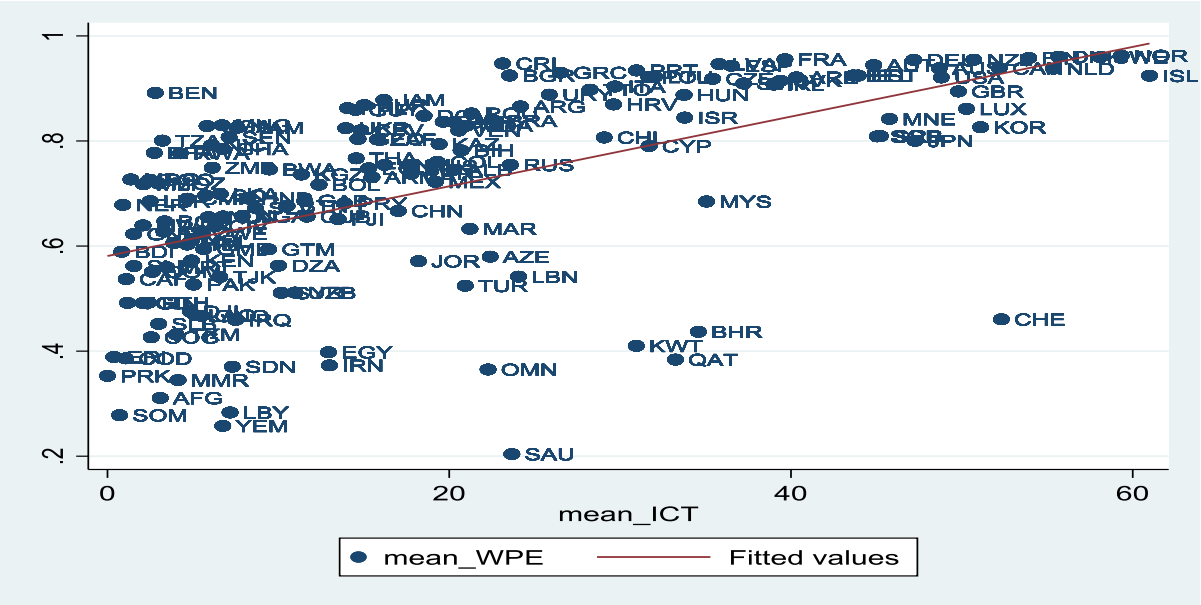
Several studies have highlighted the beneficial effects of ICT. For example, Danish et al. (2018) show that the advancement of ICT as a result of economic growth improves the quality of the environment by decreasing CO2. The use of ICT stimulates trade (Choi, 2010; Yushkova, 2014; Ozcan, 2018). Choi, (2010) finds that a 1% increase in Internet use generates an increase in trade in services between 0.023 % and 0.042%. Ozcan (2018) finds that ICT penetration significantly increases the volume of Turkish exports and imports. ICT improves financial sector development by increasing the availability of credit to businesses and households (Asongu and Nnanna, 2018; Edo et al. 2019). They also reduce information

asymmetries on the profile of borrowers and stimulate competition between formal and informal financial sectors (Asongu and Nnanna, 2018). Hamdar et al. (2017) have shown that when labor and technology increase, the value of agricultural productivity increases. Digital technologies are also catalysts for entrepreneurial activity (von Briel et al., 2018). On the other hand ; there is a growing emphasis on women's political empowerment. For this purpose ; Al Riyami et al. (2004) show that empower women are more likely to use contraception than their non-empowered counterparts. In the same vein, Doepke and Tertilt (2018) demonstrate that increasing women's empowerment leads to a significant reduction in fertility (an increase in women's empowerment, is associated with a fertility decline of 0.57 children). On the quality of institutions and governance, Swamy et al. (2001), and Dollar et al. (2001) have shown that the presence of women in senior government and parliament is associated with a reduction in the level of corruption. Many works also find that women's empowerment has a positive effect on economic growth, as well as on human capital - spending on education and health (Duflo,2012; Clots-Figueras, 2012). Many other works also highlight the influence of women in politics in the conduct of environmental policy (Sundström and McCright, 2014; Kennedy and Kmec, 2018; Mavisakalyan and Tarverdi, 2019). In particular, they suggest that a higher percentage of women in positions of political power improves the quality of the environment. it is realized that the number of internet users has increased over the period 1992-2017, while women have become more empowered, (see figure 1). the diffusion of ICT could have beneficial effects for civil freedom and participation in civil society given the role of ICT in globalization and communication.

The literature thus established clearly points to a lack of work on the relationship between ICT and women's political empowerment; In addition to filling this empirical void, our study makes three contributions on ICT and gender. First, it is the first study analysing the effect of ICT on women's political empowerment. Indeed, the studies available so far have focused more on gender inequalities in terms of access, digital device ownership, or digital literacy (Genilo et al., 2015; Ashcraft et al., 2016; Sorgner et al., 2017; Mariscal et al., 2019). We formulate a hypothesis that women's political empowerment get increased with diffusion of ICT. Second, our study uses the most recent and comprehensive WPA indicator proposed by Sundström and al. (2017). Contrary to previous indicators that have been the subject of much criticism (Klasen, 2006; Alkire and al., 2013; Liebowitz and Zwingel, 2014; Hanmer and Klugman, 2016), this one has the advantage of being based on the opinion of 2600 experts, combined with Bayesian modelling. Thirdly, this article does not stop at a causality analysis between ICT and WPE, it presents and discusses the different transmission channels through

which ICT increases women's political empowerment (quality of governance, economic globalization, and communication).

Figure 1. ICT and Women's political empowerment



Sources: IUT, V-Dem Database and authors' calculations.

The remainder of the paper is organized as follows: Section 2 lays out the economic arguments of our analysis. Section 3 and 4 respectively present the methodological framework and the results. Section 5 concludes.

THE RATIONALE OF ICT EFFECT ON THE WOMEN EMPOWERMENT

The central idea of this paper is that ICT matters in women's political empowerment. We identify potentials transmission channels through which ICT could affect WPE:

Firstly, it is well established that the Internet is an open door to the world (Karakas, 2009). A door that allows women to join global networks from their different homes and break the boundaries of closed societies. Being a new resource for communication and public engagement, access to digital ICTs can provide women and girls with alternative channels of expression and engagement in the public and political sphere, regardless of their physical location. Similarly, digital ICTs can be effective tools for widely and effectively disseminating campaign messages. Digital ICTs can break the boundaries between the public and private spheres, offering new opportunities for women's public and political participation (Gurumurthy and Chami, 2014). This freedom of expression increases women's political empowerment.

Secondly, it is also demonstrated that ICTs have been shown to have positive effects on political, economic, and institutional governance (Asongu and Nwachukwu, 2016). Digital technologies have enabled the creation of new businesses. They make it easier to find price information, reduce business travel and help communicate with existing suppliers and customers (Donner and Escobari, 2010). Mobility is key. Thus, ICT is a catalyst for entrepreneurial activity (von Briel et al. 2018; Elia et al. 2020). At the institutional level, ICTs improve responsibility, transparency, and the free flow of information within a government. (Bailard, 2009; Gagliardone, 2016). Bailard (2009) found a negative link between the penetration rate of a mobile phone in Africa and its level of corruption. The positive link between government quality and mobile-radio interactions was established by Gagliardone, (2015). Good governance (Asongu and Odhiambo, 2019) and economic opportunities lead to the empowerment of women.

METHODOLOGY

Data

Data on Women's political empowerment are drawn from Varieties of Democracy database v11.1. To the best of our knowledge, this is the most complete database on women's political empowerment to date. It covers a large number of countries (202 countries) and a much longer time horizon (1900 - 2017).

The construction of the WPE index is based on the definition of Sundström et al. (2017). They define women's political empowerment as "a process of increasing capacity for women, leading to greater choice, agency, and participation in societal decision-making". The WPE index of V-Dem reflects both fundamental civil liberties, women's open discussion of political issues and participation in civil society organizations, and the descriptive representation of women in formal political positions. Hence, it includes the Women civil liberties index (WCLI), Women civil society participation index (WCSPI), and Women's political participation index (WPPI).

As highlighted in the introduction, the most salient feature of the data is the correlation between ICT and women's political empowerment in developing countries. When we divide the sample according to the median of ICT, it seems that high ICT is associated with high levels of women's political empowerment (see Figure 2). This pattern is also true for the subdimensions of women's political empowerment, suggesting that women's political empowerment increasing with ICT.

Empirical strategy

To examine the relationship between women's political empowerment and ICT, we estimate the following model:

$$WPE_{i,t} = \beta_0 + \beta_1 ICT_{i,t} + \beta_3 X_{i,t} + \epsilon_{i,t} \quad (1)$$

Where, $\beta_1 ICT_{i,t}$ represents the individuals who have used the Internet, $WPE_{i,t}$ is our variable measuring women's political empowerment. X is a set of control variables that include traditional determinants of women's political empowerment like Early marriages, GDP, democracy, electricity, unemployment, education, Access to microfinance, Fertility, Foreign aid, Religion, Domestic violence. Building on the theoretical background of the paper, we expect a positive effect of ICT on women's political empowerment.

RESULTS

Baseline analysis

This section presents the results obtained from the estimation of equation 1 using OLS. Overall, the coefficient on ICT is positive and significant at the 1% level, with or without control variables (Table 1). This suggests that women's political empowerment increases with the diffusion of ICT. Specifically, women's access to and mastery of digital tools enables them to break down communication barriers. It allows women to undertake and seize the opportunities presented to them. All relevant control variables have signs consistent with the literature (Table 1, column 10). For one sample, women's empowerment decreases with early marriage as suggested by Goli et al., (2015). Democracy improves it. Islam presents barriers to WPE while Christianity improves it. It is in this sense that Genilo et al., (2015) found that access to digital centers varied across villages depending on women's religious identity. The distribution of power by social group or gender improves the level of WPE.

Table 1: dissemination of ICTs on women's political empowerment

	1	2	3	4	5	6	7	8	9	10
ICT	0.308***	0.246***	0.241***	0.248***	0.219***	0.260***	0.240***	0.322***	0.299***	0.154***
	(0.009)	(0.062)	(0.060)	(0.063)	(0.060)	(0.052)	(0.062)	(0.072)	(0.073)	(0.046)
Early		-0.165**	-0.161*	-0.121	-0.100	0.016	-0.113	-0.334***	-0.347***	-0.275***
Marriage		(0.076)	(0.082)	(0.083)	(0.082)	(0.083)	(0.082)	(0.089)	(0.090)	(0.067)
GDP growth			0.304	0.310	0.322	0.240	0.202	0.340	0.205	0.087
			(0.227)	(0.240)	(0.225)	(0.198)	(0.217)	(0.231)	(0.219)	(0.112)

Democracy			0.151**	0.138**	0.130**	0.106	0.149**	0.155**	0.154**	0.075**
			(0.066)	(0.065)	(0.063)	(0.065)	(0.067)	(0.068)	(0.070)	(0.035)
Protestant				0.148**						
				(0.060)						
Catholics					0.107***					
					(0.021)					
Muslims						-0.158***				
						(0.023)				
Other Religions							0.062***			
							(0.024)			
Electricity								-0.102***	-0.088***	-0.027
								(0.030)	(0.029)	(0.023)
Un-employment									-0.130	0.097
									(0.134)	(0.094)
PDSG										3.391***
										(0.595)
PDS										11.016***
										(0.805)
Observations	4387	327	323	313	317	321	318	315	311	311
R^2	0.182	0.095	0.124	0.122	0.171	0.249	0.125	0.155	0.151	0.664
F	1092.20	14.90	10.28	8.45	18.16	26.31	9.68	9.68	7.57	63.43

Note. ***, **, * indicate significance at the 1%, 5% and 10% levels of confidence.

The numbers in parentheses represent Driscoll-Kraay standard errors.

PDSG= Power distributed by social group

PDS= Power distributed by gender.

By estimating with other control variables (see Table 2), we realize that the result remains unchanged. ICTs still positively affect women's political empowerment. Indeed, the coefficient associated with this variable is significant at 1% and of positive sign. It is recognized that control variables such as vulnerable employment, spousal violence negatively affect WPE while decision-making variables such as health decisions, major household purchases, visits, and sexuality positively affect the WPE.

Table 2: estimation with other control variables

	1	2	3	4
ICT	0.136***	0.097*	0.168***	0.167***
	(0.011)	(0.051)	(0.043)	(0.050)
GDP Growth	0.069	0.219*	0.030	0.153
	(0.050)	(0.125)	(0.107)	(0.219)
Fertility rate	-3.808***			
	(0.268)			
Employment Vulnerable	-0.042***			
	(0.015)			
PDSG		2.661***	3.025***	2.930***
		(0.624)	(0.692)	(0.838)
PDS		11.108***	10.427***	9.679***
		(0.870)	(1.007)	(1.416)
Domestic violence		-0.067**		
		(0.026)		
Decision (health, household, visit)			0.065**	
			(0.030)	
decision on his sexuality				0.099**
				(0.039)
Observations	4082	214	150	76
R^2	0.303	0.666	0.633	0.648
F	456.63	58.92	47.28	19.33

Note: ***, **, **, * indicate significance at the 1%, 5% and 10% levels of confidence.

The numbers in parentheses represent Driscoll-Kraay standard errors.

PDSG= Power distributed by social group

PDS= Power distributed by gender

Robustness analysis

The previous findings establish a robust positive correlation between ICTs and women's political empowerment. Now dividing the WPE into these different components, namely Women civil liberties (WCL), Women civil society participation (WCSP), and Women political participation (WPP). It is realized that the coefficient associated with these variables remains significant and positive. It also shows that the effect is greater on Women's political participation.

Table 3: women' political empowerment and ICTs (dimension of WPE)

	WCL	WCSP	WPP
ICT	0.045***	0.037**	0.138***
	(0.017)	(0.016)	(0.035)
Education	0.055	0.073	0.124
	(0.053)	(0.050)	(0.111)
GDP Growth	0.107*	0.051	0.076
	(0.055)	(0.053)	(0.117)
democracy	0.071***	0.050**	0.252***
	(0.022)	(0.020)	(0.045)
Electricity	0.013	0.039	-0.021
	(0.036)	(0.034)	(0.076)
Fertility rate	-5.685***	-4.284***	-8.578***
	(0.815)	(0.783)	(1.744)
LnAccess to microfinance	0.202	0.304	0.240
	(0.259)	(0.241)	(0.544)
lnForeign_aid	0.935***	0.758**	0.633
	(0.347)	(0.329)	(0.730)
PDSG	3.911***		0.919
	(0.637)		(1.397)
PDS		5.759***	9.340***
		(0.649)	(1.502)
Observations	436	436	436
R^2	0.466	0.520	0.440
F	31.67	39.31	25.58

Note: ***, **, **, * indicate significance at the 1%, 5% and 10% levels of confidence.

The numbers in parentheses represent Driscoll-Kraay standard errors.

PDSG= Power distributed by social group; PDS= Power distributed by gender.

CONCLUSION

This paper analyzes the effect of ICTs on women's political empowerment. Using data from 161 developed and developing countries, we provide robust evidence on women's political empowerment with dissemination of ICTs. To explain these results, we highlight the role of ICT in improving good governance, economic globalization, and enhanced communication, which in turn contribute to women's political empowerment. In terms of recommendations, we call on decision-makers to adopt inclusive policies that enable women's economic and political empowerment, such as promoting girls' education and limiting early marriage. Encourage the

insertion of women in all professional sectors. Condemn violence against women. This empowerment will allow women to be assets for development. Thus, future research could focus, for example, on the effect of women's political empowerment on the structural transformation of economies or on the green economy. Indeed, a strong representation of women in decision-making bodies could have effects on the transformation of economies while reducing the level of global warming.

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APPENDIX

Variable description and source, 1992-2017

Variable	Source	Obs	Mean	Std.Dev	Min	Max
WPE	Sundström et al. (2017	4,442	0.7104381	0.1953049	0.0461794	0.9758749
ITC	ITU	4,439	19.05013	26.68316	0	100
Early marriage	WDI	329	8.30457	8.457996	0	50.3
GDP growth	WDI	4,291	2.184874	6.480816	-64.99237	140.3708
Democracy	Polity-V	4,416	1.494112	17.94078	-88	10
Electricity	WDI	3,699	76.37731	32.18757	0.01	100
unemployment	WDI	4,347	8.963563	7.271748	0.08	47.59
Education	UNESCO	665	76.97958	24.08421	4.59183	99.99761
Access to microfinance	WDI	2,663	19.20228	1.689193	11.1521	24.08539
Fertility rate	WDI	4,501	3.263652	1.736345	1.052	8.606
Foreign_aid	WDI	3,237	19.48502	1.380478	9.21034	23.96865

Catholics	La porta et al., 1999	4,368	30.01667	35.19246	0	96.9
Protestant	La porta et al., 1999	4,284	11.54052	20.30199	0	97.8
Muslims	La porta et al., 1999	4,452	25.94553	36.88909	0	99.8
Other Religions	La porta et al., 1999	4,396	33.31312	32.35201	0.1	100
PDSG	V-Dem	4,466	0.6717541	1.183497	-2.681869	3.453951
PDS	V-Dem	4,466	0.796754	1.089674	-2.803702	3.844923
Domestic violence	WDI	215	38.17767	24.52719	0.8	92.1
decision (health, household, visit)	WDI	150	48.052	22.01929	6.3	92.8
decision on his sexuality	WDI	76	48.28816	20.69147	4.9	81

Note : WPE= women's political empowerment ; PDSG= Power distributed by social group ;

PDS= Power distributed by gender ;

Obs.' Denotes the number of observations for the respective variable.

The last four columns show the mean, standard deviation, minimum and maximum.