

Exploring Economic Indicators Empowering Women as Entrepreneurs

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Abstract

This study examines the impact of the Women Entrepreneurs Finance Initiative (We-Fi) since its inception in 2017 on entrepreneurial activities in vulnerable or conflict economies. Using multivariate regression analysis and datasets from the Global Entrepreneurship Monitor (GEM) and the World Bank Indicators to detect the influence of We-Fi's financial support alongside other economic and sociopolitical variables on both the total early-stage entrepreneurial activity (Total TEA) and the Female/Male TEA Ratio across 30 countries from years 2015 and 2019. Key findings indicate that We-Fi has had a positive influence in closing the gap for women to access entrepreneur financing and yet challenges remain due to systemic barriers erected by political and economic institutions. The findings highlight the need for policymakers to consider both financial support and structural reforms in promoting female entrepreneurship.

1 Introduction

Entrepreneurship is recognized as an agent of change stimulating economic activity, driving innovation, addressing social issues, and encouraging personal development. Policymakers want to understand indicators that spur entrepreneurship activities to shape public policies. Complicating the understanding of entrepreneurial activity factors is the differing viewpoints of entrepreneurship and the interconnected nature of individual, society, institutions, and economy. Underlying the motivation of policies and programs to promote an entrepreneurial ecosystem is the implicit assumption that all entrepreneurs, regardless of gender, have equal access to resources and a fair chance of success.

In practice, both theoretical and empirical evidence show that women more than men face barriers when it comes to access to entrepreneur financing (Brush, et al, 2017, p. 394). To bridge “the global \$1.7 trillion financing gap (We-Fi, 2022)”, The Women Entrepreneurs Finance Initiative (We-Fi) has injected \$3.6 billion to women-led enterprises since 2017 located in vulnerable and conflict economies: Angola, Egypt, India, Indonesia, Iran, Israel, Lebanon, Madagascar, Morocco, Sudan, and Turkey. *Is there evidence the We-Fi providing financing to women-led enterprises translate to an increase in total entrepreneurial activity for an economy?*

In addition to access to financing, what other factors influence early entrepreneurial activity? Despite their good intentions, We-Fi’s support to “vulnerable and conflict countries (We-Fi, 2022)” may not be enough to overcome insurmountable cultural and political barriers women face to have any impact on entrepreneurial growth. A paper by Jia suggests that “On the other hand, instead of aiding productive entrepreneurs, aid allocated to countries with weak institutions, such as lack of property rights, could undermine a recipient country’s incentive structures for entrepreneurship and encourage nonproductive entrepreneurial activities (Jia, 2018, p. 250)”. An alternative story would be that local government policy changes to create proper

institution incentives would have more of an impact than an international institution like We-Fi financing of women-led enterprises.

2 Background

Varying definitions of Entrepreneurship

There is a vast body of literature supporting the importance of entrepreneurs as a vital factor in economic development, but literature shows that there are different understandings of entrepreneurs, and entrepreneurial activity. On a global scale, there is interest in studying entrepreneurship but “There are myriad definitions that describe the notion of entrepreneurship in terms of high-level principles, but those definitions are not easily reflected through statistical measures (Davis, 2008, p. 39). According to Jia, there are “productive” versus “non-productive” entrepreneurs. Productive entrepreneurs introduce innovation which leads to an increase in productivity. Non-productive entrepreneurs hinder economic growth and reduce social welfare by seeking transfers from productive entrepreneurs (Jia, 2018, p. 248). This paper will not be differentiating productive nature of entrepreneurship and adopts a more generalized definition of entrepreneurship per GEM, “Any attempt at new business or new venture creation, such as self-employment, a new business organization, or the expansion of an existing business, by an individual, a team of individuals, or an established business (Reynolds et al., 1999, p. 3).

Why study entrepreneurship through the lens of gender?

According to the World Economic Forum (WEF) “Global Gender Gap Report 2020”, the Economic Participation and Opportunity measure has the second widest gender gap, second to Political Empowerment. The primary reason for this gap is explained by the lower participation of women in the labor force. Globally, approximately adult men (15-64) account for 78% of the labor force while compared to only 55% women. Another explanation for this gap, WEF found that “that women are less likely than men to

obtain revenues from non-employment activities (i.e. from financial investment, entrepreneurship) where financial gains are substantially higher (WEF, 2020, p. 11). Despite the global gender gap, McKinsey Global Institute projection from a 2015 report that if women participated in the economy identical to men, we could see a 26 percent increase to the global GDP by 2025 – translating to \$28 trillion. Closing the gender gap for gender entrepreneurship translates to both genders for that economy, Hechavarría and Ingram contends that “government support for women’s entrepreneurship positively affected both male and female venturing rates. (Hechavarría, 2017), p.433).” This paper will be building on Hechavarría and Ingram’s paper “Entrepreneurial ecosystem conditions and gendered national-level entrepreneurial activity: a 14-year panel study of GEM” and introducing additional World Bank Indicators not included in the survey and a dummy variable indicating if a country received funding from We-Fi initiatives since 2017.

3 Empirical Framework and Data Description

Method

This paper constructed country level data from the following sources GEM Adult Population Survey (APS), World Bank Indicators, and We-Fi website. GEM is a consortium of national teams and partners created in 1997 to study and measure entrepreneurship from two perspectives: individual and ecosystem. Their dataset at the individual-level is based on surveys sent to a minimum of 2000 respondents coordinated through the national teams of over 115 economies (GEM, 2024).

Independent Variable

Entrepreneurship will rely on two GEM indicators: Total Early-Stage Entrepreneurial Activity (Total TEA) and Female/Male TEA Ratio. The two indicators will be used as the independent variable in the model collected at country-level. GEM defines Total TEA, “the percentage of adults (18-64) population involved in early entrepreneur activity or owners of a new business”. Total TEA is differentiated by gender in the Female/Male

TEA Ratio is “Percentage of female 18-64 population who are either a nascent entrepreneur or owner-manager of a 'new business', divided by the equivalent percentage for their male counterparts (GEM, 2024).

Countries and Dependent Variables

All countries overlapping between GEM data and World Bank Indicators database were used to achieve the largest sample size for empirical analysis. Our final dataset comprises of 60 observations for 30 countries for the years 2015 and 2019. From GEM, there are 30 observations of the Total TEA and Female/Male TEA for each country. From World Bank Indicators Database, the same 30 GEM countries were used to download the following independent variables for 2015 and 2019 and matched to GEM data using country names. As noted in Appendix 1, there were six country names that did not match between the two sources, WB country names were updated to match GEM. Egypt, Arab Rep. was changed to Egypt, Slovak Republic was changed to Slovakia and Korea, Rep. to South Korea. The following dependent variables were collected for WB Indicators site: (1) 'Country Name' (2) 'Country Code' (3) 'GNI per capita (constant 2015 US\$) [NY.GNP.PCAP.KD]' (4) 'Start-up procedures to register a business (number) [IC.REG.PROC]' (5) 'Start-up procedures to register a business, female (number) [IC.REG.PROC.FE]' (6) 'Start-up procedures to register a business, male (number) [IC.REG.PROC.MA]' (7) 'Time required to start a business (days) [IC.REG.DURS]' (8) 'Time required to start a business, female (days) [IC.REG.DURS.FE]' (9) 'Time required to start a business, male (days) [IC.REG.DURS.MA]' (10) Female share of employment in senior and middle management (%) [SL.EMP.SMG.T.FE.ZS] (11) Proportion of seats held by women in national parliaments (%) [SG.GEN.PARL.ZS] (12) Cost of business start-up procedures (% of GNI per capita) [IC.REG.COST.PC.ZS] (13) Cost of business start-up procedures, female (% of GNI per capita) [IC.REG.COST.PC.FE.ZS] (14) GDP per capita (constant 2015 US\$) [NY.GDP.PCAP.KD]

Discussion

This paper examines how three main measures of starting a new business on early entrepreneurial activity by country: procedures (number of steps), time to create a new start up (number of days),

and cost required (% of GNI) on the Female/Male Tea index. Three new variables were created calculating the proportion of female to male for procedures, time, and cost. The three new variables for the countries we evaluated on these measures for 2015 and 2019 all equal to one indicating that women and men entrepreneurs took equal amount of steps, number of days, and cost (as a percentage of GNI) to start up a new business. These results indicate that these three indicators do not influence the female to male tea at the country level. Dependent variables entrepreneurial activity by gender is perfectly collinear with each other so variables representing both genders were used in the analysis.

Two variables are specifically measure of female participation in the economy in unique dimensions. The female shares of employment in senior and middle management (%) speaks to the participation women in the labor market and their success signaling a closing of the gender gap for the country. The proportion of seats held by women in national parliaments field provides context to the political environment for women in the country. Cost of creating a startup appears to be significant factor in explaining Total TEA and Female/Male TEA – the higher the cost prohibits entrepreneurs entering the market.

The w is a dummy variable with values yes or no if a country received support from the We-Fi initiative. All data from 2015 the dummy variable will have value of 0 indicating none of the countries received treatment. For 2019, the treatment group countries: Egypt, India, Iran, Israel, and Morocco will have dummy variable equal to 1.

Results

Table 2, and 3 represent the descriptive statistics, bivariate, multi-variate regression models. In countries with women represented in leadership roles in the labor market as well as being represented in their political environment shows a strong relationship to total early entrepreneurial activity for that country's. The cost of creating a start-up plays a role as well but to a lesser extent. Tables 3 and 4 are bivariate models predicting total TEA and female/male TEA where women as senior or middle managers as well as GDP

statistically significant at 1% alpha level. The bivariate results from Table 4 show that results from a bivariate model have the highest R^2 of 0.217 indicating a 21.7% variance in Female/Male Tea explained by proportion of women in senior positions but we need to test for omitted variable bias. The multivariate models listed in Table 6 show a statistically significant model at 1% alpha with R^2 value almost doubling from the bivariate models showing that not enough variables were included in the model. Table 6 shows the strongest linear regression model predicting Female/Male TEA for years 2015 and 2019 for the countries listed. Table 7 shows regression predicting Female/Male TEA with the addition of a dummy variable, w, having values w for countries that received support from We-Fi initiative since 2017. All countries from 2015 have the dummy variable equal to 0. The resulting multivariate model the best model improvements to R^2 value and coefficients of predictor models statistically significant at 1% alpha level and low standard errors.

Conclusion

This paper set out to answer the question, *“Is there evidence the We-Fi providing financing to women-led enterprises translate to an increase in total entrepreneurial activity for an economy?”* The statistically significant multivariate regression model explaining 32.51 % of variance in the Female/Male TEA indicator, where dummy variable, w, is equal to 1 for countries receiving support from We-Fi with additional significant World Bank Indicators seems to be a good fit for the model for Egypt, India, Iran, Israel, and Morocco highlighting the importance of the entrepreneurship ecosystem in supporting women with respect to their access to financing:

$$FemaleMaleTEA = 0.354 + .011femaleshareseniornum + 0.77w + -1.89e-06gdppercapita$$

Future research would be to include the fourteen years of data available from GEM and cross-search against the World Bank Indicators databank.

Table 1: List of Countries and Years Included in Analysis

GEM Countries	WB Countries	Mismatched Names	Year(s)
Brazil	Brazil		2015,2019
Canada	Canada		2015,2019
Chile	Chile		2015,2019
Colombia	Colombia		2015,2019
Croatia	Croatia		2015,2019
Egypt	Egypt, Arab Rep.	*	2015,2019
Germany	Germany		2015,2019
Greece	Greece		2015,2019
Guatemala	Guatemala		2015,2019
India	India		2015,2019
Iran	Iran, Islamic Rep.	*	2015,2019
Ireland	Ireland		2015,2019
Israel	Israel		2015,2019
Italy	Italy		2015,2019
Latvia	Latvia		2015,2019
Luxembourg	Luxembourg		2015,2019
Morocco	Morocco		2015,2019
Netherlands	Netherlands		2015,2019
Norway	Norway		2015,2019
Panama	Panama		2015,2019
Poland	Poland		2015,2019
Slovakia	Slovak Republic		2015,2019
Slovenia	Slovenia		2015,2019
South Africa	South Africa	*	2015,2019
South Korea	Korea, Rep.	*	2015,2019
Spain	Spain		2015,2019
Sweden	Sweden		2015,2019
Switzerland	Switzerland		2015,2019
United Kingdom	United Kingdom		2015,2019
United States	United States		2015,2019

Table 2: Indicator Description, Variable Names, Descriptive Statistics

Indicator Description (Variable Name)	(1) mean	(2) sd	(3) min	(4) max
1. Total TEA [%] (totaltea)	11.81	6.422	2.790	36.71
2. Female/Male TEA [%] (femalemaletea)	0.645	0.162	0.320	0.980
3. GNI per capita [constant 2015 US\$] (gnipercapitanum)	29,107	23,767	1,572	84,653
4. GDP per capita [constant 2015 US\$] (gdppercapita)	30,680	27,055	1,590	107,351
5. Time required to start a business [days] (timestartbusiness)	15.93	17.16	1.500	86
6. Time required to start a business, Female [days] (timestartbusinessfemale)	15.96	17.21	1.500	85.97
7. Time required to start a business, Male [days] (timestartbusinessmale)	15.90	17.10	1.500	85.97
8. Start-up procedures to register a business [number] (startupprocedures)	5.933	2.564	2	14
9. Start-up procedures to register a business, Female [number] (startupproceduresfemale)	5.992	2.627	2	13.94
10. Start-up procedures to register a business, male [number] (startupproceduresmale)	5.926	2.548	2	13.94
11. Female share of employment in senior and middle management [%] ((startupprocedures)	30.68	8.902	6.415	46.41
12. Proportion of seats held by women in national parliaments [%] (femaleshareseniornum)	25.43	10.45	3.103	47.28
13. Cost of business start-up procedures [% of GNI per capita] (coststartup)	5.567	6.277	0	25.10
14. Cost of business start-up procedures, Female [% of GNI per capita] (coststartupfemale)	5.567	6.277	0	25.10
15. Cost of business start-up procedures, Male [% of GNI per capita] (coststartupmale)	5.567	6.277	0	25.10

Table 3: Multivariate Regression Models Predicting Total TEA (1) and Female/Male TEA (2)

Predictor Variable Names	Independent Variables	
	(1) totaltea	(2) femalemaletea
3. gnipercapitanum	3.91e-06 (2.92e-05)	-5.58e-07 (1.06e-06)
4. gdppercapita	-4.58e-05* (2.48e-05)	-1.59e-06* (9.04e-07)
5. timestartbusiness	-0.0271 (0.0417)	-0.446 (0.716)
8. startupproceduresbusiness	0.511 (0.323)	0.263 (0.357)
11. femaleshareseniorum	0.452*** (0.0749)	0.00929*** (0.00336)
12. womenparlaimentnum	-0.244*** (0.0564)	-0.00103 (0.00210)
13. coststartup	0.255** (0.112)	-0.000350 (0.00405)
Constant	0.873 (3.935)	0.403** (0.170)
R-squared	0.624	0.348

Coefficient of each variable is listed in the model and standard errors in parentheses. World Bank Indicators: womenparlaimentnum = Proportion of seats held by women in national parliaments [%] , gdppercapita = GDP per capita [constant 2015 US\$], femaleshareseniorum = Female share of employment in senior and middle, coststartup = Cost of business start-up procedures [% of GNI per capita]

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

Table 4: Bivariate Model Predicting Total TEA				
Predictor Variable Names	Independent Variable			
	(1) totaltea	(2) totaltea	(3) totaltea	(4) totaltea
11. femaleshareseniornum	0.240*** (0.0879)			
12. womenparlamentnum		-0.240*** (0.0753)		
13. coststartup			0.0852 (0.134)	
4. gdppercapita				-6.28e-05** (3.01e-05)
Constant	3.963 (2.805)	17.99*** (2.069)	11.33*** (1.118)	13.74*** (1.225)
R-squared	0.135	0.151	0.007	0.070

Coefficients of predictor variables listed. Standard errors in parentheses. . World Bank Indicators: womenparlamentnum = Proportion of seats held by women in national parliaments [%] , gdppercapita = GDP per capita [constant 2015 US\$], femaleshareseniornum = Female share of employment in senior and middle, coststartup = Cost of business start-up procedures [% of GNI per capita]

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

Table 5: Bivariate Model Predicting Female/Male TEA

Predictor Variable Names	Independent Variables			
	(1) femalemaletea	(2) femalemaletea	(3) femalemaletea	(4) femalemaletea
11. femaleshareseniornum	0.00835*** (0.00229)			
12. womenparlamentnum		-0.00111 (0.00200)		
13. coststartup			-0.00192 (0.00339)	
4. gdppercapita				-7.40e-07 (7.83e-07)
Constant	0.387*** (0.0731)	0.678*** (0.0550)	0.656*** (0.0283)	0.668*** (0.0319)
R-squared	0.217	0.005	0.006	0.015

Coefficients of predictor variables listed. Standard errors in parentheses. World Bank Indicators:

womenparlamentnum = Proportion of seats held by women in national parliaments [%], gdppercapita = GDP per capita [constant 2015 US\$], femaleshareseniornum = Female share of employment in senior and middle, coststartup = Cost of business start-up procedures [% of GNI per capita]

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

Table 6: Multivariate Models Predicting Total TEA (1) and Female/Male TEA (2)

Predictor Variable Names	Independent Variables	
	(1) totaltea	(2) femalemaletea
11. femaleshareseniornum	0.350*** (0.0830)	0.0106*** (0.00228)
4. gdppercapita	-9.77e-05*** (2.58e-05)	-2.03e-06*** (7.10e-07)
Constant	3.698 (2.483)	0.382*** (0.0682)
Observations	50	50
R-squared	0.336	0.333

Coefficients listed with Standard errors in parentheses. World Bank Indicators: gdppercapita = GDP per capita [constant 2015 US\$], femaleshareseniornum = Female share of employment in senior and middle

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

Table 7: Multivariate Models Predicting Female/Male TEA with Dummy Variable (w)		
Predictor Variable Names	Independent Variables	
	(1) totaltea	(2) femalemaletea
11. femaleshareseniornum	0.374*** (0.0835)	0.0112*** (0.00232)
w	3.550 (2.366)	0.0765 (0.0656)
4. gdppercapita	-9.14e-05*** (2.59e-05)	-1.89e-06** (7.17e-07)
Constant	2.397 (2.600)	0.354*** (0.0721)
Observations	50	50
R-squared	0.367	0.352

Coefficients listed with Standard errors in parentheses. Dummy variable (w) added with values 1 if country received support from We-Fi Initiative (We-Fi, 2024). For 2019, the treatment group countries: Egypt, India, Iran, Israel, and Morocco will have dummy variable equal to 1. All countries from 2015, have w value of 0 because We-Fi was created in 2018. World Bank Indicators: gdppercapita = GDP per capita [constant 2015 US\$], femaleshareseniornum = Female share of employment in senior and middle management [%]

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

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