Journal of Economics and Behavioral Studies (ISSN: 2220-6140)
Vol. 13, No. 5, pp. 63-72, October 2021

Formal Female Entrepreneurship and the Shadow Economy

Cassandra E. DiRienzo* & Jayoti Das
Department of Economics, Elon University, USA
cdirienzo@elon.edu, dastina@elon.edu

Abstract: Although female entrepreneurship yields products, markets, and business models that might not exist otherwise and are relevant to economic growth and development as well as issues related to gender equality, the factors that drive female entrepreneurship is largely understudied. The primary objective of this study is to examine the relationship between the size of a country's informal sector and the prevalence of female entrepreneurship in the formal economy. This relationship is empirically tested using a regression analysis that employs a cross-country data set of 70 countries. The analysis results indicate a significant inverse relationship between the size of the informal sector and the prevalence of formal sector female entrepreneurship. It is argued that a larger informal economy implies a greater number of women working in the informal sector due to discriminatory barriers to the formal economy. Both formal sector entrepreneurship and work in the informal economy can lessen the barrier to entry women face related to work-life balance by allowing greater flexibility in work hours; however, employment in the informal sector is a relatively poor substitute to formal sector employment as informal sector work does not include benefits, nor is it taxed or included in official statistics. Policy recommendations for encouraging formal female entrepreneurship are made. Promoting female entrepreneurship in the formal sector not only helps to close gender, inequality gaps, but also serves to improve tax systems, lessen distortions in national accounts and official indicators, and improve the provision of public goods.

Keywords: *Female Entrepreneurship, Shadow Economy, Formal Sector, Barriers to Entry, Work-Life Balance.*

1. Introduction

Entrepreneurship has long been recognized as a critical source of sustained economic growth and development as it generates employment opportunities, drives innovation and spending in markets, and enhances knowledge transfers (Aparicio et al., 2016; Meyer & de Jongh, 2018). Understanding and promoting the mechanisms that foster entrepreneurship is therefore relevant to macroeconomic policymakers as well as officials operating at the industry level. Previous research has found that while some of the mechanisms that drive entrepreneurial activity are similar among men and women, there are factors that uniquely affect female entrepreneurship (Verheul, et al., 2004; Minniti & Naudé, 2010; Daymard, 2015). As Verheul, et al. (2004) describe, as compared to their male counterparts, female entrepreneurs tend to develop different personal and business profiles, pursue different goals, operate their businesses in other sectors, and develop different products. As a result, female entrepreneurs contribute to economic growth and development by creating products, markets, and business models that perhaps would not exist otherwise. Further, female entrepreneurship generates economic opportunities for women and can provide an exit from poverty, especially in developing countries (Lock & Smith, 2016; Daymard, 2015; Minniti & Naudé, 2010).

Analyzing the factors that drive female entrepreneurship is important not only from a macroeconomic perspective of economic growth and development but also as a tool to combat poverty. Although there are clear benefits to studying the drivers of female entrepreneurship, as De Brui et al. (2006) state, the field is vastly understudied. This study contributes to the literature on female entrepreneurship by further exploring the factors that affect female engagement in entrepreneurship; specifically, the size of a country's shadow or informal economy. As Verheul, et al. (2004) describe, the size of the informal economy can have a different impact on female versus male entrepreneurship. A significant body of literature has concluded that women are more likely to work in the informal sector than their male counterparts as the informal sector allows greater work-life flexibility and has lower barriers to entry compared to the formal sector (Goel & Saunoris, 2017; Fapohunda, 2012; Nelson, 1999; Chant & Pedwell, 2008; International Labour Organization, 2018; Verheul, et al., 2004; Daymond, 2015; Minniti & Naudé, 2010). Fapohunda (2012, pg. 35) states that women dominate the informal sector as "(e)mployment opportunities in the formal sector are often denied (to) women because of family responsibilities, lack of skills, social and cultural barriers".

Chant & Pedwell (2008, pg. 13) refer to this occurrence as the "feminization of informal labor". Although entrepreneurship in the formal sector is generally associated with greater barriers to entry, entrepreneurial work can nevertheless offer greater flexibility for work that typically falls to women such as childcare and other household tasks, compared to employment in the formal, non-entrepreneurial sector (Daymard, 2015). In this light, work in the informal sector and entrepreneurial work in the formal sector can be viable options for women seeking flexible employment opportunities. Nonetheless, the formal sector is associated with greater barriers to entry relative to the informal economy. Due to social and cultural discrimination, women are more likely to face formal sector barriers related to lack of education, skills, and access to capital, which can render entrepreneurship in the formal sector unattainable. The primary objective of this study is to empirically explore the relationship between the size of a country's shadow economy or informal sector and the prevalence of female entrepreneurship in the formal economy. It is hypothesized that there is an inverse relationship between the size of the informal sector and the prevalence of formal sector female entrepreneurship. A relatively larger informal sector implies there are more women employed in this sector due to more work opportunities in the informal economy and/or because they face barriers to entering the formal sector. This hypothesis is tested using a cross-country data set. The analysis results indicate that if women are unable to overcome discriminatory barriers to formal sector entrepreneurship, they tend to be employed in the informal sector. Paid work in the informal sector is, however, an inferior employment opportunity for women as informal sector work does not include benefits such as health care and retirement benefits, which will serve to widen the gender pay gap.

2. Literature Review

Female Employment and Barriers to Entry: Compared to their male counterparts, females arguably face greater barriers to entry in attaining employment in the formal sector across the globe. These barriers can be subdivided into two broad categories; family and childcare demands and discrimination that limits or prevents access to education, skill attainment, property or capital. In reference to family and childcare demands, the ILO (2018, pg. 1) notes that women "…often bear the brunt of unpaid childcare and domestic work" and devote more hours of unpaid care work than men. Fapohunda (2012, pg. 40) states that formal sector employment opportunities in Nigeria "…are often denied (to) women as a result of family responsibilities…" and, in a study of female entrepreneurs in India, Daymard (2015) finds that women often substitute formal employment for informal work to have greater flexibility for childcare and domestic tasks. About the actual childcare duties, Craig & Powell (2011, pg. 276) state that mothers tend to take on the more labor-intensive, "…physical care tasks such bathing, dressing, feeding, changing and putting children to bed". Craig & Powell (2011) note that these tasks generally need to be done at specific times of the day, which implies that women are less likely to be able to maintain standard work hours in the formal sector. In a study of female entrepreneurs in Singapore, Kim & Ling (2001) find that married female entrepreneurs bear the majority of responsibilities for household work and childcare, which creates an obstacle in managing their own businesses. In a recent study exploring the impact of the COVID-19 pandemic on housework and childcare among Italian men and women, Del Boca et al. (2020, pg. 1001) find that the women have undertaken "…most of the additional housework and childcare associated to COVID-19…". As Kim & Ling (2001, pg. 204) succinctly state, "(a)s long as the society continues to emphasi(z)e a woman's basic role as that of mothering, working women will face role struggles."

The second barrier women face entering the formal sector is discrimination that results in a lack of education, or the skills required for formal sector employment, and/or access to capital and property needed to conduct business in the formal economy. As the ILO (2018) describes, a range of discriminatory social norms can limit women's access to education and skill attainment as well as property, assets, and financial services and, as Kahn et al. (2013) note, gender discrimination leads to an under-investment in women in the labor market. Hargaittai & Shafer (2006, pg. 434) state, "(t)he extent to which human capital is fostered, employed, and recognized is profoundly social and has often been examined along gender lines" and note the extensive literature exploring the educational and occupational inequities for men and women. Further, as Daymard (2015) describes, a low level of education is widely recognized as a barrier to entry in the formal sector, especially in developing countries. A considerable body of research has examined the role of discrimination towards women on a variety of socio-economic outcomes at the country level. In a Pakistani study, Salik &

Zhiyong (2014) find that in areas of Pakistan equal opportunity in higher education does not exist and women face significant hurdles in obtaining higher education due to gender discrimination.

In another Pakistani study, Roomi & Parrott (2008, pg. 59) conclude that female entrepreneurs "…suffer from a lack of access to capital, land, business premises, information technology, training and agency assistance…" as a result of "…deep-rooted discriminatory socio-cultural values and traditions". In Southern and Eastern Sub-Saharan Africa, Joireman (2008, pg. 1238) describes how "…women have not traditionally or legally shared the same protections of their property and inheritance rights as men…" and face barriers in the most basic economic tasks such as "…selling their own produce or in buying new fields..." Further, Joireman (2008) states that even if laws exist to enable women to operate as legally recognized economic actors in Sub-Saharan Africa, there are social restrictions that prevent them from doing so. In a comparison study of male- and female-owned small and medium-sized enterprises in Ghana, Abor & Biekpe (2006) find that the female-owned enterprises are significantly less likely to employ debt finance, which supports the view that there is discrimination in the lending process. In Nigeria, Fapohunda (2012) states that women are often denied employment opportunities in the formal sector due to a lack of skills. In a study of women entrepreneurship in Asian developing countries, Tambunam (2009) finds that the representation of female entrepreneurs is relatively low, which Tambunam (2009) attributes to the low levels of education and lack of capital among women in these countries.

Fawole (2008, pg. 168) describes these discriminatory practices as economic violence and defines this violence towards women as occurring when "…a male abuser maintains control of the family finances, deciding without regard to women how the money is spent or saved, thereby reducing women to complete dependence for money to meet their personal needs." Fawole (2008) states that economic violence towards women includes restricted access to funds and credit, lack of control over education, discriminatory traditional laws on inheritance, property rights, and use of communal land. Gender-based inequities in education and access to capital have also been identified in developed countries. In a study examining access to capital among small businesses in the United States, Robb (2013) finds that women-owned businesses operate with considerably less capital, on average, compared to their male counterparts. Diehl (2014) notes that women represent only 26 percent of all college and university presidencies in the United States, and through a series of interviews with women in senior leadership roles, participants reported experiencing gender-based barriers. In another study of higher education in the United States, Vasquez (1982) finds that Mexican American women face barriers to higher education that are based on sex-role restrictions. In a Canadian study, Ferguson (2016, pg. 3) finds that although women have become increasingly well-educated, Canadian women "…continue to have fewer apprenticeship or trade certificates as well as STEM university degrees than their male counterparts."

Female Entrepreneurship in Formal Sector: Entrepreneurship in the formal sector lessens one of the barriers to entry by offering women greater flexibility to manage childcare and other domestic tasks. McGowan et al. (2012) state that a significant number of women choose entrepreneurship as a means to balance work responsibilities with domestic commitments and Bhardwaj & Mittal (2017, pg. 44) refer to female entrepreneurship as a "(t)ool for work-life balance". As dos Santos et al. (2019) describe, female entrepreneurs have some characteristics in common with other entrepreneurs; however, their motivations, such as the desire for greater flexibility to manage work-life balance, differ from their male counterparts. In a study of female entrepreneurs, Agarwal & Lenka (2015) note that women start up their own businesses to gain greater flexibility and control their professional and personal responsibilities.

In a literature review of female entrepreneurship, Poggesi et al. (2016, pg. 755) conclude that the role of the family is present in all identified streams of literature and state that "(t)he search of a better balance between work and family is indeed considered as one of the strongest motivations leading women to start and run their own businesses." A survey conducted by U.S. Small Business Administration found that women are more likely to start a business to maintain a work-life balance (Roy, 2014) and in a study in the Netherlands, Annink & den Dulk (2012) find that a greater number of women are starting their own businesses to balance both paid work and family life. As Rehman & Roomi (2012) state, the concept of work-life balance is no longer limited to western culture and has spread to eastern cultures due in part to globalization. In a study in the Emirates, Forster et al. (2013) find that an increasing number of Emirate women are opting for self-

employment to gain work-life balance. Daymard (2015) finds that female entrepreneur in India who do not have employees often also substitute regular employment to gain greater time flexibility for household tasks or childcare.

Female Employment in the Informal Sector: While entrepreneurship can lessen the barrier to employment that women face by providing greater control over their work hours, work in the informal sector can also lessen this barrier in addition to removing the discrimination barrier that can limit or prevent women's access to education, skill attainment and capital. The informal sector or the shadow economy is broadly defined as the "…(m)arket-based production of goods and services, whether legal or illegal, that escapes detection in the official estimates of GDP…" (Smith, 1997, pg. 15). Work in the informal sector is undetected and untaxed and is largely conducted under the radar of government officials. Thus, as Goel & Saunoris (2017) describe, the informal sector has fewer barriers to entry given the lack of required certifications and regulations. Meagher (2010) notes that economists have viewed the informal economy as a sector free of gender-biased regulations and a source of economic opportunity for women.

ILO (2018) states that the majority of workers in the informal economy are women and Nelson (1999) concludes that participation in the informal economy is significantly differentiated by gender. The relatively low barriers make work in the informal sector attractive to women who are seeking paid work, but also need flexible work hours and might not have the education or certifications needed to work in the formal sector. Further, as Goel & Saunoris (2017) describe women in certain countries might be discouraged from working outside of the home, which can lead to informal sector work being the only viable option. Female informal sector work can include a range of domestic work, childcare, and the selling of homemade commodities, among other forms of work (Mohapatra, 2012; Goel & Saunoris, 2017). As Chant & Pedwell (2008, pg. 1) state that "(w)omen remain concentrated in 'invisible' areas of informal work, such as domestic labor piece-rate homework, and assistance in small family enterprises…". It is important to note that female entrepreneurship exists in the informal sector as well; however, these enterprises go unregulated and untaxed and are not under the purview of government oversight.

Formal Female Entrepreneurship and the Shadow Economy: Thus, both entrepreneurship in the formal economy and informal sector work can lower barriers women face to paid work; however, the informal sector arguably removes more of these barriers. Further, the larger the size of a country's shadow economy suggests that relatively more women are employed in this sector as women dominate the shadow economy (ILO, 2018). A larger shadow economy also implies that there are more informal work opportunities for women relative to a country with a relatively small shadow economy. In reference to female entrepreneurship, Verheul, et al. (2004, pgs. 6-7) suggest that the size of the informal sector can be negatively related to entrepreneurial activity in the formal sector as "…people operating in the informal sector absorb (entrepreneurial) opportunities otherwise available for individuals starting a business in the formal sector." Thus, it is hypothesized:

H1: All else equal, there is an inverse relationship between the size of the informal sector and the prevalence of formal sector female entrepreneurship. This hypothesis is empirically tested using data from 70 countries and a description of the methodology and data used follows.

3. Methodology

Regression analysis is used to empirically test the hypothesis of an inverse relationship between the size of a country's informal sector and the prevalence of female entrepreneurship. The regression model is defined as:

$$Formal\ Female\ Entrepreneurship_i = \beta_0 + \beta_1 Shadow_i + \beta_2' Z_i + \varepsilon \qquad (1)$$

Where *Formal Female Entrepreneurship* represents the prevalence of formal sector female entrepreneurship, *Shadow* represents the size of a country's informal or shadow economy, and *Z* is a vector of control variables. A description of the data and measures of formal female entrepreneurship, the size of the shadow economy, and control variables follow.

Data: Formal Female Entrepreneurship and Shadow Economies. The Global Entrepreneurship and Development Institute's (GEDI), Female Entrepreneurship Index (FEI) is used to proxy the prevalence of formal female entrepreneurship at the country level. As GEDI (n.d.) describes the FEI "…measures the development of high potential female entrepreneurship worldwide". The GEDI defines 'high potential' female entrepreneurship as female start-ups that are related to 'high impact entrepreneurship', or market expanding, innovative, and exporting businesses (Terjesen & Lloyd, 2015). The FEI is based on 15 pillars that contain both individual and institutional variables corresponding to both the micro and macro-level aspects of female entrepreneurship (Terjesen & Lloyd, 2015). To calculate the FEI, the GEDI states that it sources data from internationally recognized sources such as the World Economic Forum, the ILO, and the Global Entrepreneurship Monitor (GEDI, n.d.). The FEI ranges from a maximum value of 100 to a minimum value of zero. In 2015, the United States, Australia, and the United Kingdom ranked first, second, and third with FEI scores of 82.8, 74.8, and 70.6, respectively.

In the middle range, Peru, Barbados, and Greece ranked 38th, 39th, and 40th in 2015 with FEI scores of 43.6, 43.4, and 43.0, respectively. The lowest-ranked countries in 2015 are Pakistan, Malawi, and Bangladesh with ranks of 77th, 76th, and 75th and FEI scores of 15.2, 15.5, and 17.9, respectively. Medina & Schneider's (2018) most recent data is used to measure the size of a country's shadow or informal economy as a percent of its GDP. This database includes country-level data from 1991 to 2015 and, although other measures of informal economies exist, Medina & Schneider (2018) note that their estimation process is unique as it is the first to incorporate the light intensity approach as an indicator variable within Multiple Indicators Multiple Causes. Further, their estimation process also uses a full alternative methodology, Predictive Mean Matching. Medina & Schneider's (2018) measure of the size of countries' shadow economies has been used in several recent studies including Cuong et al. (2021), Alarcón-García (2020), and Huynh, C. M. (2020).

Data: Control Variables.

Female Education: As described above, lack of education or access to education is a barrier that can prevent women from starting a business in the formal sector. Daymard (2015) notes education as a factor affecting female entrepreneurship and Goel & Saunoris (2017) describe how limited education levels can drive women to work in the informal sector rather than the formal sector. The percentage of the female population aged 25 and older with some secondary education that is provided by the United Nations is used to measure the level of female education within a country.

Ease of Doing Business: The relative ease of establishing and operating businesses in the formal sector affects both male and female entrepreneurship (Daymard, 2015). The World Bank's Doing Business (DB) index is used to proxy the relative ease of conducting business within a country. The DB index analyzes regulation that promotes efficiency and supports the freedom to conduct business by examining 12 different areas of business regulation, including the ease of starting a business. The DB scores range from zero (least relative ease of conducting business) to 100 (greatest relative ease of conducting business). The World Bank's DB index has been used in recent studies such as Estevão et al. (2020).

Female Representation in Parliament: As previously discussed, women can face a host of discriminatory cultural and social norms that prevent or restrict access to the property, assets, financial services, and the general freedom to work outside of the home (ILO, 2018; Goel & Saunoris, 2017). Thus, it is important to control for gender-based cultural and/or social barriers that limit not only women's societal mobility, but their ability to establish and operate businesses in the formal sector. The percentage of seats held by women in national parliaments (WP) provided by the World Bank is used as a proxy for this cultural and/or social barrier. All else equal, the greater the percentage of women holding seats in parliament, arguably implies a greater societal acceptance of women as respected leaders and businesses operators.

Economic Development: Finally, the level of economic development is controlled for as income per capita affects both male and female entrepreneurship (Daymard, 2015). Developed countries tend to be associated with higher overall institutional quality, lower corruption, and stronger intellectual property rights, all of which support entrepreneurial activity. The World Bank's 2015 GDP per capita (GDPPC) is used to measure income per capita at the country level.

Descriptive Statistics: The above data is available for 70 countries and a list of the countries included in the analysis is provided in Table 1.

Table 1: Countries Included in Analysis

Algeria	Costa Rica	Hungary	Mexico	Spain
Angola	Croatia	Iceland	Netherlands	Sweden
Argentina	Czech Republic	India	Norway	Switzerland
Australia	Denmark	Iran	Pakistan	Thailand
Austria	Ecuador	Ireland	Peru	Trinidad and Tobago
Bangladesh	El Salvador	Israel	Poland	Tunisia
Belgium	Estonia	Italy	Portugal	Turkey
Bolivia	Ethiopia	Jamaica	Romania	Uganda
Bosnia & Herzegovina	Finland	Japan	Russia	United Arab Emirates
Botswana	France	Korea	Saudi Arabia	United Kingdom
Brazil	Germany	Latvia	Singapore	United States
Chile	Ghana	Lithuania	Slovakia	Uruguay
China	Greece	Malawi	Slovenia	Venezuela
Colombia	Guatemala	Malaysia	South Africa	Zambia

Table 2 provides a summary of the data sources used in this analysis and the descriptive statistics. A correlation matrix is provided in Table 3. As expected, formal female entrepreneurship (FEI) is positively correlated with female education (FED), ease of doing business (DB), percentage of parliament seats held by women (WG), and income per capita (GDDPC). Notably, FEI has a strong negative correlation with the size of a country's shadow economy (Shadow), which offers initial support for H1.

Table 2: Data Summary and Descriptive Statistics

Variable	Data Source	Mean	St. Deviation	Min	Max
Formal Sector Female Entrepreneurship (FEI)	GEDI	45.45	1.97	15.2	82.9
Size of the Shadow Economy (Shadow)	Medina & Schneider (2018)	22.21	1.23	6.9	46.9
Female Education (FED)	United Nations	69.32	2.92	10.8	100
Ease of Doing Business (DB)	World Bank	68.2	1.45	34.1	84.9
% Female Held Parliament Seats (WG)	World Bank	25.11	1.35	3.1	53.1
Income per Capita (GDPPC)	World Bank	21,020.6	2,411.0	380.6	84,776.1

Table 3: Correlation Matrix

	FEI	Shadow	FED	DB	WG	GDPPC
FEI	1					
Shadow	-0.74	1				
FED	0.79	-0.65	1			
DB	0.83	-0.61	0.75	1		
WG	0.26	-0.12	0.04	0.07	1	
GDPPC	0.79	-0.70	0.63	0.66	0.30	1

4. Analysis of Results and Discussion

The estimated regression results are provided in Table 4. The results show that, on average, countries with a greater percentage of females with secondary education, greater ease of doing business, a greater percentage of female parliament seats, and higher income per capita tend to also have a greater prevalence of formal female entrepreneurship. These results support previous research. Regarding H1, the coefficient on the size of a country's shadow economy is negative and significant, suggesting that, all else equal, the larger the size of

a country's shadow economy, the lower the prevalence of formal female entrepreneurship, which supports H1. Further, the variance inflation factors are low and range from 1.15 to 2.73, indicating the multicollinearity is not an issue in the regression and we fail to reject the null hypothesis of no heteroscedasticity using White's test (p-value, 0.4232).

Table 4: Estimated Regression Results

	Coefficient Estimate	Std Err	t Stat	P-Value	VIF
Intercept	-3.61	7.70	-0.47	0.6406	0
Shadow	-0.28	0.12	-2.36**	0.0215	2.302
FED	0.16	0.05	2.95***	0.0044	2.731
DB	0.52	0.11	4.74***	<0.0001	2.697
WG	0.19	0.08	2.51**	0.0148	1.159
GDPPC	0.0002	0.00007	2.86***	0.0057	2.680
Adj. R^2 = 0.8351 *F* stat = 70.87***		*p <0.10; **p <0.05; ***p<0.01			

About female employment opportunities, these results imply a substitute relationship between formal female entrepreneurship and work in the informal sector. As previously discussed, both formal entrepreneurial work and work in the informal sector can lessen barriers to employment women face; however, barriers resulting from social and/or cultural discrimination can still prevent women from starting businesses in the formal sector. Notably, although these two types of employment can be viewed as substitutes, it is important to highlight that they are far from perfect substitutes. By the very nature of being conducted underground and off-book, informal sector work does not come with a variety of benefits, such as health care and retirement benefits, that are found exclusively in the formal sector. Relative to informal sector work, work in the formal sector can offer greater gender equality as it can serve to close the gender pay gap by giving women retirement benefits and improved access to health care. Formal sector employment is included in a country's national accounts and official indicators. Countries with large informal economies distort national accounts and official indicators on unemployment, labor force, income, and consumption (Bovi, 2002; Schneider & Enste, 2000). Biases in official data hamper economic and social policy planning, which can result in inefficient allocation of resources and poorly designed national tax systems (Bayer et al., 2018; Bovi, 2002). Further, because informal economic activities are omitted from official records and are therefore untaxed, the reduced tax revenue can limit the provision of public goods and slow economic growth (Bovi, 2002). Thus, while both types of work can offer women a means to earn money and, in some cases, offer women an exit from poverty, they are far from equal economic opportunities.

5. Implications and Recommendations

The overarching implication of this study is that to enhance female entrepreneurship in the formal sector policies are needed to address social and cultural discrimination that limits women's access to education, property rights, and capital. Policies designed to address these discriminatory barriers need to consider the gender-based social and cultural restrictions that are unique to the society; however, as Latu et al. (2019, pg.11) state, "…(f)emale role models can inspire girls and women in male-typical domains." Thus, policymakers should contemplate ways to support or recognize successful female entrepreneurs who serve as guest speakers in schools and universities. Policymakers should also consider policies that encourage girls and women to take coursework and/or receive certifications in entrepreneurship and business. Other methods to promote successful female entrepreneurship could be conducted through public service and social media campaigns. These campaigns should highlight successful female entrepreneurs as positive female role models to encourage other women into the field. Policies that encourage bank lending to female start-ups can provide access to funds and enable women to operate businesses in the formal sector. Finally, policymakers need to examine the inherent gender biases that can exist in inheritance laws and property rights. As long as discriminatory barriers exist, women seeking economic opportunity will more likely end up working in the informal sector without retirement and health care benefits, which will widen the gender pay gap and exacerbate gender inequalities.

Conclusion: The primary objective of this study was to empirically explore the relationship between the size of a country's informal sector and the prevalence of female entrepreneurship in the formal economy. Using a cross-country data set of 70 countries, the analysis results indicate that there is a statistically significant inverse relationship between the size of a country's shadow economy and the prevalence of formal sector female entrepreneurship. This result suggests that if women cannot overcome discriminatory barriers to formal sector entrepreneurship, they are more likely to seek employment in the shadow economy. Work in the shadow economy is inferior to formal sector employment for both women and a country as a whole as informal sector work does not include benefits, nor is it taxed or included in official statistics. We offer recommendations to policymakers seeking to encourage formal female entrepreneurship. Promoting female entrepreneurship in the formal sector not only helps to close gender inequality gaps, but also serves to improve tax systems, lessen distortions in national accounts and official indicators, and improve the provision of public goods. Formal female entrepreneurship also contributes to a country's GDP and economic growth by providing markets and goods that might not be available otherwise. Efforts made to advance female entrepreneurship in the formal economy have clear benefits for the macro economy and gender equality.

References

Abor, J. & Biekpe, N. (2006). SMEs' access to debt finance: A comparison of male-owned and female-owned businesses in Ghana. *The International Journal of Entrepreneurship and Innovation*, 7(2), 105-112.

Agarwal, S. & Lenka, U. (2015). Study on work-life balance of women entrepreneurs–review and research agenda. *Industrial and Commercial Training,* 47(7), 356-362.

Alarcón-García, G., Azorín, J. D. B. & de la Vega, M. D. M. S. (2020). Shadow economy and national culture: A spatial approach. *Hacienda Pública Española/Review of Public Economics*, 232(1), 53-74.

Annink, A. & den Dulk, L. (2012). Autonomy: the panacea for self-employed women's work-life balance? *Community, Work & Family*, 15(4), 383-402.

Aparicio, S., Urbano, D. & Audretsch, D. (2016). Institutional factors, opportunity entrepreneurship and economic growth: Panel data evidence. *Technological forecasting and social change*, 102, 45-61.

Bayar, Y., Odabas, H., Sasmaz, M. U. & Ozturk, O. F. (2018). Corruption and the Shadow Economy in Transition Economies of European Union: A Panel Cointegration and Causality Analysis. *Economic Research*, 31(1), 1940 – 1952.

Bhardwaj, B. R. & Mittal, V. (2017). Women entrepreneurship: A tool for work-life balance. In *International conference on technology and business management*, 17, 44-50.

Bovi, Maurizio. (2002). The Nature of the Underground Economy – Some Evidence from OECD Countries. ISAE, Istituto di studi e analisi economica.

Chant, S. & Pedwell, C. (2008). Women, gender and the informal economy: An assessment of ILO research and suggested ways forward. https://ecommons.cornell.edu/bitstream/handle/1813/100337/ILO_Women_Gender_InformalEconomy.pdf?sequence=1

Cuong, H. V., Luu, H. N. & Tuan, L. Q. (2021). The impact of the shadow economy on foreign direct investment. *Applied Economics Letters*, 28(5), 391-396.

Craig, L. & Powell, A. (2011). Non-standard work schedules, work-family balance and the gendered division of childcare. *Work, Employment and Society*, 25(2), 274-291.

Daymard, A. (2015). Determinants of Female Entrepreneurship in India. OECD Economics Department Working Papers, No. 1191, OECD Publishing, Paris. https://doi.org/10.1787/5js4rfh5gtbq-en.

De Bruin, A., Brush, C. G. & Welter, F. (2006). Introduction to the Special Issue: Towards building cumulative knowledge on women's entrepreneurship. *Entrepreneurship Theory and Practice*, 30(5), 585–593.

Del Boca, D., Oggero, N., Profeta, P. & Rossi, M. (2020). Women's and men's work, housework and childcare, before and during COVID-19. *Review of Economics of the Household*, 18(4), 1001-1017.

Diehl, A. B. (2014). Making meaning of barriers and adversity: Experiences of women leaders in higher education. *Advancing Women in Leadership Journal*, 34, 54-63.

Dos Santos, V. F., Morais, G. M., de Araújo Ribeiro, F. F. & Jardim, D. (2019). Female Entrepreneurship: Evolution, Current Challenges, and Future Prospects. *International Journal of Business Administration*, 10(5), 24-32.

Estevão, J., Lopes, J. D., Penela, D. & Soares, J. M. (2020). The Doing Business ranking and the GDP. A qualitative study. *Journal of Business Research*, 115, 435-442.

Fapohunda, T. M. (2012). Women and the Informal Sector in Nigeria: Implications for Development. *British Journal of Arts and Social Sciences*, 4 (1), 35 – 45.

Fawole, O. I. (2008). Economic violence to women and girls: is it receiving the necessary attention? *Trauma, Violence, & Abuse*, 9(3), 167-177.

Ferguson, S. J. (2016). Women and Education: Qualifications, Skills and Technology. Women in Canada: A Gender-Based Statistical Report. *Statistics Canada*. https://eric.ed.gov/?id=ED585396.

Forster, N., Al Ali Ebrahim, A. & Ibrahim, N. A. (2013). An Exploratory Study of Work-Life Balance and Work-Family Conflicts in the United Arab Emirates. *Skyline Business Journal*, 9(1), 34 - 42.

Global Entrepreneurship and Development Institute (GEDI). (n.d.). https://thegedi.org/research/womens-entrepreneurship-index/.

Goel, R. K. & Saunoris, J. W. (2017). Unemployment and International Shadow Economy: Gender Differences. *Applied Economics,* 49(50), 5828–5840.

Hargittai, E. & Shafer, S. (2006). Differences in actual and perceived online skills: The role of gender. *Social Science Quarterly*, 87(2), 432-448.

Huynh, C. M. (2020). Shadow economy and air pollution in developing Asia: what is the role of fiscal policy? *Environmental Economics and Policy Studies*, 22(3), 357-381.

Joireman, S. F. (2008). The mystery of capital formation in Sub-Saharan Africa: women, property rights and customary law. *World Development*, 36(7), 1233-1246.

Khan, M., Akhtar, S., Mehmood, H. Z. & Muhmood, K. (2013). Analyzing skills, education and wages in Faisalabad: Implications for labor market. *Procedia Economics and Finance*, 5, 423-432.

Kim, J. L. S. & Ling, C. S. (2001). Work-family conflict of women entrepreneurs in Singapore. *Women in Management Review,* 16(5/6), 204- 221.

Latu, I. M., Mast, M. S., Bombari, D., Lammers, J. & Hoyt, C. L. (2019). Empowering mimicry: Female leader role models empower women in leadership tasks through body posture mimicry. *Sex roles*, 80(1), 11-24.

Lock, R. & Smith, H. L. (2016). The impact of female entrepreneurship on economic growth in Kenya. *International Journal of Gender and Entrepreneurship*, 8(1), 90-96.

McGowan, P., Redeker, C. L., Cooper, S. Y. & Greenan, K. (2012). Female entrepreneurship and the management of business and domestic roles: Motivations, expectations and realities. *Entrepreneurship & Regional Development*, 24(1-2), 53-72.

Meagher, Kate. (2010). 72 the empowerment trap: gender, poverty and the informal economy in sub-Saharan Africa, 472 – 477. https://www.wiego.org/sites/default/files/publications/files /Meagher_Gender.Empowerment.Trap_.pdf.

Medina, L. & Schneider, M. F. (2018). Shadow economies around the world: what did we learn over the last 20 years? International Monetary Fund. https://www.elibrary.imf.org/view/journals/001/2018/017/article-A001-en.xml.

Meyer, N. & de Jongh, J. (2018). The importance of entrepreneurship as a contributing factor to economic growth and development: The case of selected European countries. *Journal of Economics and Behavioral Studies*, 10(4(J)), 287-299.

Minniti, M. & Naudé, W. (2010). What Do We Know About The Patterns and Determinants of Female Entrepreneurship Across Countries? *European Journal of Development Research* 22**,** 277–293. https://doi.org/10.1057/ejdr.2010.17.

Mohapatra, K. K. (2012). Women workers in informal sector in India: understanding the occupational vulnerability. *International Journal of Humanities and Social Science*, 2(21), 197-207.

Nelson, M. K. (1999). Economic Restructuring, Gender, and Informal Work: A Case Study of a Rural County 1. *Rural Sociology,* 64(1), 18-43.

Poggesi, S., Mari, M. & De Vita, L. (2016). What's new in female entrepreneurship research? Answers from the literature. *International Entrepreneurship and Management Journal*, 12(3), 735-764.

Rehman, S. & Roomi, M. A. (2012). Gender and work-life balance: a phenomenological study of women entrepreneurs in Pakistan. *Journal of Small Business and Enterprise Development,* 19(2), 209–228.

Robb, A. (2013). Access to capital among young firms, minority-owned firms, women-owned firms, and high-tech firms. Office of Advocacy, US Small Business Administration, Washington, DC. https://cdn.advocacy.sba.gov/wp-content/uploads/2019/05/15130241/rs403tot2.pdf.

Roomi, M. A. & Parrott, G. (2008). Barriers to development and progression of women entrepreneurs in Pakistan. *The Journal of Entrepreneurship*, 17(1), 59-72.

Roy, P. (2014). Analyzing female entrepreneurship in a global context-the challenges and the road ahead. *International Journal of Information and Management Sciences*, 1(5), 332-336.

Salik, M. & Zhiyong, Z. (2014). Gender discrimination and inequalities in higher education: A case study of rural areas of Pakistan. *Academic Research International*, 5(2), 269 - 276.

Schneider, F. & Enste, D. (2000). Shadow Economies: Size, Causes, and Consequences. *Journal of Economic Literature*, 38(1), 77 -114.

Smith, P. M. (1997). Assessing the size of the underground economy: The statistics Canada perspective. The underground economy: Global evidence of its size and impact, 11-37. https://www.fraserinstitute.org/sites/default/files/UndergroundEconomy.pdf#page=33.

Tambunan, T. (2009). Women entrepreneurship in Asian developing countries: Their development and main constraints. *Journal of Development and Agricultural Economics*, 1(2), 027-040.

Terjesen, S. & Lloyd, A. (2015). The Female Entrepreneurship Index (FEI). Global Entrepreneurship and Development Institute (GEDI), Paper No. 15-51. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2625254.

Verheul, I., van Stel, A. J. & Thurik, A. R. (2004). Explaining female and male entrepreneurship across 29 countries. Papers on Entrepreneurship, Growth and Public Policy, No. 0804. https://www.econstor.eu/handle/10419/19953.

Vasquez, M. J. (1982). Confronting barriers to the participation of Mexican American women in higher education. *Hispanic Journal of Behavioral Sciences*, 4(2), 147-165.