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Research Article

Financial Development and Female Labor Income Share: Evidence from Global Data

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While there has been sizable literature on the effect of financial development on growth, inequality, and poverty, there are fewer studies on its impact on female labor force participation or women's wellbeing. Using a novel dataset, this paper investigates the association between the dimensions of financial development and female labor income share for 156 countries for the period of 1991-2019 to contribute to the literature on the role of financial development in improving women's wellbeing. The findings show that financial development is positively associated with women's income in high-income countries but not in low-income countries. The main implication of the study is that financial development in poor countries is not sufficiently inclusive enough to create economic opportunities for women.

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1 Introduction

There has been substantial literature on the relationships between financial development and macroeconomic indicators, including growth, income inequality, and poverty (Demirgüç-Kunt & Levine, 2009; Levine, 2021), and between economic growth and gender (in)equality (Klasen, 2002; Berik et al., 2011), whereas the literature on the effect of financial development on gender equality is relatively small, focusing on its effect on female labor participation rate (FLFP) (Chen & Chen, 2016; Aggarwal, 2019) or gender empowerment in general (Han & Melecky, 2013; Swamy, 2014). Using a novel data set, this paper contributes to this literature by providing evidence on the associations between the dimensions of financial development and female labor income share.

Financial development refers to advanced financial instruments, markets, and intermediaries that improve resource allocation by reducing transaction costs and making information more accessible (e.g., minimizing the market frictions). Empirical evidence shows that, overall, financial development increases economic growth and reduces income inequality. It affects income distribution through three major mechanisms (Levine, 2021, 41-47). First, a better-functioning financial market allocates credit based on individuals' ideas and abilities

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rather than family wealth, thereby allocating available capital more efficiently in the economy. Such an advanced system lowers the intergenerational persistence in human capital. Second, financial development can alter the relative demand for more skilled or less-skilled workers by lowering barriers to the entry of new firms and creating a more competitive labor market. Finally, financial development reduces income inequality by making investment available for people with different incomes and wealth.

Financial development can help overcome women's generally limited access to credit by increasing their labor force participation and labor income through new economic opportunities. However, women's ability to benefit from this may be limited in lower-income countries, especially those with stricter gender norms. Thus, despite some progress, gender gaps in access to financial services remain significant (Sahay et al., 2018). The impact of financial development may also depend on the type of financial development.

While the FLFP rate has increased in most countries in the last few decades, it has remained well below that of males, particularly in developing countries in the non-agricultural sector. An extensive literature has explored the causes of the widespread increase in FLFP (Ostry et al., 2018), suggesting changes in cultural attitudes (Fernandez et al., 2004; Alesina et al., 2013), women- and childcare-friendly policies (Connelly, 1992; Gornick et al., 1998), and technological change promoting sectors with greater gender equality (Autor & Dorn, 2013; Autor, 2015). The number and diversity of these factors in implementation explain why FLFP varies remarkably between countries despite the overall rise.

Financial inclusion has been considered by policymakers as one of the key implementations to increase FLFP and women's empowerment. However, a consistent and significant gender gap in access to financial assets has been noted (Naituli et al., 2006; Ellis et al., 2007; Demirgüç-Kunt & Klapper, 2013; Demirgüç-Kunt et al., 2013; Hallward-Driemeier, 2013; Swamy, 2014; Deléchat et al., 2018; Sahay et al., 2018; Morsy, 2020; UN Women, 2021). There are different sources of gender gaps in financial inclusion. Among them, the discrepancy in wealth and education levels and financial literacy, violence against women, and political factors are particularly important to note (Demirgüç-Kunt et al., 2008; Balasubramanian et al., 2019). Controlling for major individual characteristics such as income and education levels, studies showed that the gender gap results from gender norms and legal discrimination against women (Demirgüç-Kunt et al., 2013).

Some studies have provided evidence that there has been gender discrimination in entrepreneurs' ability to obtain a loan (Belluci et al., 2010; Muravyev et al., 2009; Klapper & Parker, 2011). For example, Asiedu et al. (2013) showed that female-owned firms are less likely than male-owned firms to have access to credit, and women are also subject to higher interest rates for credit (Muravyev et al., 2009; Demirgüç-Kunt et al., 2008).

Financial inclusion allows women to have more control over their financial assets and build a credit history (Ruiz, 2013; Schaner, 2016; Arnold & Gammage, 2019), which, in turn, eases getting a loan. Innovative financial products and services to create more inclusive digital economies for women are suggested to reduce the gender gap in access to financial services (Arnold & Gammage, 2019; Salman & Nowacka, 2020; Kim, 2022). Asongu & Odhiambo (2018) showed for 48 African countries from 2004 to 2014 that improving information and communication technology is a significant factor in increasing FLFP. Other studies have suggested that mobile money has strengthened women's financial inclusion (Buvinic & Furst-Nichols, 2016), and it enabled more women to join paid labor market (Suri & Jack., 2016; Kim, 2022, 307).

Better financial conditions may translate into the empowerment of women as it may improve their bargaining power in households. Ohiomu & Ogbeide-Osaretin (2020) showed for 17 sub-Saharan African countries for the period of 2011-2017 that there is a significant negative association between women's financial access and gender inequality measured by the United Nations' Gender Inequality Index. An interesting implication of the study is that women tend to prefer traditional banking services instead of advanced financial tools.

However, it is important to note that financial inclusion alone may not be an effective tool to increase women's empowerment if they fail to address gender-biased socio-economic conditions that generate the gap in financial inclusion (Llussa, 2009; Natile, 2019; Kim, 2022). Kim (2022), for example, argues that although mobile money facilitates women's financial empowerment, gender inequality and discrimination against women still need to be addressed. Therefore, for financial inclusion to have an impact on women's (economic) empowerment, the social norms that reinforce gender inequality need to be addressed and acted upon.[1]

Overall, financial development (or financial inclusion) alone may not be a successful implementation to increase FLFP and women's empowerment. Put it differently, the outcomes may be different with respect to the type of financial development and income level of the countries. To contribute to this line of research, this study is the first to examine the effects of all dimensions of financial development on women's labor income in countries with different income groups.

The remainder of the paper is organized as follows: Section 2 introduces data and method, while Section 3 discusses the results. Finally, Section 4 summarizes the findings and provides some policy recommendations.

2 Data and Method

2.1 Data

The main dependent variable is the female labor income share (FLIS), provided by Neef & Robilliard (2021) while the key independent variable is the financial development index, calculated by the IMF (Svirydzenka, 2016). FLIS refers to the sum of labor income earned by women relative to the national aggregate of labor income within a country. Neef & Robilliard (2021, 2) compute FLIS directly from survey micro data for countries for which the Luxembourg Income Study and the European Union Statistics on Income and Living Conditions data are available. Then, they obtain data for other countries by estimating the relationship between the female labor income share and the female wage and self-employment shares.

Since financial development is a multidimensional process, its measurement requires a comprehensive approach rather than using just one or a few variables. Therefore, Svirydzenka (2016) has the broadest approach, having nine indices: the financial development index (the main index) and its sub-indices (the financial institutions index and the financial markets index). Each of these has three sub-indices measuring depth, access, and efficiency, as summarized in Table 1.

[1] See Roberts (2015) for a critical feminist analysis of financial inclusion.

Table 1: Financial Development Indicators

Category		Indicator
Financial Institutions	Depth	Private-sector credit to GDP Pension fund assets to GDP Mutual fund assets to GDP Insurance premiums, life and non-life to GDP
	Access	Bank branches per 100,000 adults ATMs per 100,000 adults
	Efficiency	Net interest margin Lending-deposits spread Non-interest income to total income Overhead costs to total assets Return on assets Return on equity
Financial Markets	Depth	Stock market capitalization to GDP Stocks traded to GDP International debt securities of government to GDP Total debt securities of financial corporations to GDP Total debt securities of nonfinancial corporations to GDP
	Access	Percent of market capitalization outside of top 10 largest companies Total number of issuers of debt (domestic and external, nonfinancial and financial corporations)
	Efficiency	Stock market turnover ratio (stocks traded to capitalization)

Source: Svirydzenka (2016)

We also use real GDP per capita (2015 constant US dollars) and trade openness (shares of export and import in GDP) as control variables, all obtained from the World Bank. We use data of 156 countries for the period of 1991-2019, which is the largest data set available.

2.2 Method

We use a dynamic panel method to analyze the relationship between financial development and women's income. Our empirical approach utilizes a dynamic specification to account for the occurrence of significant lagged effects of the dependent variable, which determines serial correlation in the dependent variable. Regression specification for dynamic panel structure is as follows:

$$FLIS_{it} = \alpha + \beta(financialization_{it-1}) + \gamma X_{it} + \epsilon_i + \eta_t + u_{it} \tag{1}$$

where the subscripts i and t denote countries and years, respectively.

X_{it} is the set of control variables (i.e., GDP per capita and openness). ϵ_i are the unobserved country-specific fixed-effects, η_t are year dummies, and, finally, u_{it} are the identically and independently distributed error terms. To control for individual fixed effects (ϵ_i), we can write equation (1) in differences. The first differencing specification is thus as follows:

$$\Delta(FLIS_{it}) = \alpha + \beta(\Delta financialization_{it-1}) + \gamma \Delta X_{it} + \eta_t + \Delta u_{it} \tag{2}$$

where Δ is the first difference operator.

First differencing addresses any potential bias that might be caused by fixed country-specific effects. However, this leads to a downward bias of the estimated parameter of the lagged dependent variable (Nickell, 1981).

Arellano & Bond (1991) suggested using a Generalized Method of Moment (GMM) estimation (i.e., difference GMM), which takes the endogeneity into account. However, this estimator may lead to biased results if cross-section variability dominates time variability and if there is a strong persistence in the examined time series (Bond et al., 2001). Arellano & Bover (1995) and Blundell & Bond (1998) proposed the system GMM, an augmented version of difference GMM. The system GMM employs different instruments for each estimated equation simultaneously. This method uses the lagged levels of the regressors as instruments for the difference equation and the lagged first differences of the regressors as instruments for the levels equation. Also, system GMM allows controlling for the dynamics of adjustment by including a lagged endogenous variable among the exogenous variables.

The system GMM is widely used for dynamic panel data analysis, particularly for common cases of large N and small T data, and allows some endogenous variables and fixed effects (Roodman, 2009).[2]

3 Results and Discussion

Since our focus is on the association between different financial development dimensions and FLIS Table 2 presents the summary results of the system GMM estimations (i.e., the coefficients of financial development indicators in all model specifications) for convenience.[3] The full results are provided in the appendix.[4]

Regarding the financial development index, the most general index, there is a highly significant positive association between financial development and FLIS for all countries. However, the results differ with respect to income groups. The effect is negative for low-middle-income and lower-income countries but strongly positive in upper-middle and high-income countries. Regarding the financial institutions index, the significant positive overall association is only due to wealthy countries as well. The results for the financial markets index, on the other hand, are not significant for all countries, while the results for income groups are similar to the financial development and financial institutions indices.

The results with respect to sub-indices of the financial institutions index and financial markets index are remarkable. Financial institutions efficiency index is significantly negatively associated with FLIS, decoupling from financial institutions depth and financial institutions access indices. Taking a closer look at financial institutions efficiency index in Table 2, it is safe to argue that 'efficiency' of financial institutions in terms of higher net interest margin, lending-deposits spread, return on assets, or return on equity only help men to earn a higher return on their savings, and has no effect on women who have either no financial assets or no control on their financial assets. It is worth noting that the results are highly consistent with the findings of (Kırmızıoğlu & Elveren, 2022), where the authors

[2] We use Roodman (2006)'s 'xtabond2' command for the STATA 14.2. All estimations were conducted with two-step efficient GMM and small sample corrections to the covariance matrix estimate.

[3] In addition to the categorization suggested by the World Bank, we combine low and low-middle-income groups (i.e., lower-income) since some estimations are omitted due to very small number of observations in low-income countries.

[4] Standard diagnostic tests for system GMM suggest that the estimates are reliable, and the validity of instruments is not rejected.

Table 2: Effects of Financial Development on Female Labor Income Share
Summary Results of GMM Estimations

Variables	All	Low	Low middle	Lower	Upper middle	High
Financial Development Index	0.008*** (0.002)	0.055 (0.041)	-0.028*** (0.004)	-0.013*** (0.003)	0.011** (0.005)	0.008*** (0.001)
Financial Institutions Index	0.013*** (0.003)	0.038 (0.026)	-0.015*** (0.003)	-0.006* (0.003)	0.009** (0.004)	0.024*** (0.002)
Financial Markets Index	0.003 (0.002)	0.122 (0.089)	-0.015*** (0.001)	-0.005*** (0.002)	0.002 (0.003)	0.002*** (0.0004)
Financial Institutions Depth Index	0.011*** (0.002)	0.076** (0.026)	-0.012*** (0.004)	0.036*** (0.005)	0.014** (0.006)	0.009*** (0.001)
Financial Institutions Access Index	0.011*** (0.002)	0.052*** (0.014)	-0.012*** (0.002)	0.005** (0.003)	0.008*** (0.002)	0.017*** (0.002)
Financial Institutions Efficiency Index	-0.005** (0.002)	0.016 (0.012)	-0.006*** (0.001)	-0.013*** (0.001)	-0.006** (0.002)	-0.009*** (0.001)
Financial Markets Depth Index	0.001 (0.001)	0.053 (0.035)	-0.018*** (0.003)	-0.009*** (0.003)	0.004 (0.003)	0.001 (0.001)
Financial Markets Access Index	-0.001 (0.001)	-0.648 (1.644)	0.008 (0.009)	0.001 (-0.004)	-0.011** (0.004)	-0.002*** (0.001)
Financial Markets Efficiency Index	0.003*** (0.001)	NA	-0.003 (0.005)	-0.005 (0.005)	0.003 (0.002)	0.003*** (0.001)

Note: Standard errors in parenthesis. Significance is denoted by *** at 1%, ** at 5%, and * at 10% level.

use three estimators[5]: first, the mean group estimator created by (Pesaran & Smith, 1995), which allows for complete diversity in cross-country parameters; second, the dynamic fixed effects estimator of Pesaran et al. (1999), which equalizes all slope coefficients across countries; third, the pooled mean group estimator, which equalizes the long-run slope coefficients across countries.

Thus, the two major findings are, first, financial development generally has dramatically different effects on poor and wealthy countries. Specifically, women in developed countries are far more likely to benefit from financial development due to economic development and perhaps gender relations. In contrast, financial development has almost no positive impact in developing countries. Second, while the financial institutions variables (e.g., the private-sector credit-to-GDP ratio or the number of banks and ATMs) are associated with higher FLIS in developing countries, the financial market indicators (e.g., stock market capitalization to GDP) are negatively associated with it. These findings are consistent with the literature suggesting a significant gender gap in access to finance (Morsy, 2020). Making credit more available for women both through public and private agencies and reducing gender disparities in educational attainment would boost FLIS.

[5] While GMM is widely used for dynamic panel data analysis -particularly for common cases of large N and small T data, Kiviet (1995) warns that homogeneity assumptions regarding the slope coefficients of lagged dependent variables can create significant biases in GMM analyses. This can produce inconsistent and misleading long-run coefficients if the slope coefficients are not identical (Pesaran & Smith, 1995). Therefore, Kırmızıoğlu & Elveren (2022) uses the autoregressive distributed lag models (ARDL), introduced by Pesaran et al. (1999). These are heterogeneous dynamic panel models in which the cross-sectional dimension augments the time-series information and T is sufficiently large that the fixed effect Nickel bias is not a problem. It derives consistent and efficient estimates of the parameters in a long-run relationship between both integrated and stationary variables in a panel data structure.

4 Conclusion

This study contributes to the extensive literature on the role of financial development in an economy by focusing on its impact on women's income. There are some studies that focus on financial inclusion. They underscore the fact that women's access to financial means and financial markets is limited, particularly in developing countries. Some of them have argued that such a limited inclusion of women undermines the potential impact of financial development on economic growth. It is against this background that, in this study, we focus on the direct effect of financial development on women's income. To this end, we utilize a novel data set of the female labor income share.

Our findings demonstrate striking differences between country groups regarding the effects of financial development on female labor income share. While women can benefit from financial development in developed countries, it is not valid in the case of developing countries. That is, our findings confirm and strengthen the previous findings that there exists a considerable gender gap in financial inclusion. In addition, the differences in financial inclusion vary depending on the specific financial development index. That is, the financial institutions variables such as the private-sector credit-to-GDP ratio or the number of banks and ATMs are associated with higher FLIS in developing countries, whereas the financial market indicators such as stock market capitalization to GDP are negatively associated with it. The main insight is that if financial development in developing countries ignores women's economic and social disadvantages, then it will not be sufficiently inclusive to reduce economic gender disparities. This main implication of the study is particularly important once the nexus of economic growth and gender equality is considered. A substantial literature, both in neoclassical economics and feminist economics, has argued this significant positive link between gender inequality and growth.

We acknowledge that there are two main limitations of this study. First, the model that we use can be improved both in terms of different control variables and estimation methods. Second, more importantly, panel data studies provide a general understanding of the relationship in question. As encouraged, it is important to support panel data studies with time-series studies to better analyze the country-specific legislative structure and institutions. Such case studies, perhaps some comparative ones, would provide a more detailed understanding of the relationship between financial development and women's income, emphasizing the critical role of gender in those countries. Future studies may consider these issues.

References

Aggarwal, M. (2019). *Linkages between Innovation, Financial Development and Female Labor Force Participation: Evidence from India* (Working Paper). SSRN. doi:10.2139/ssrn.3903166

Alesina, A., Giuliano, P., & Nunn, N. (2013). On the Origins of Gender Roles: Women and the Plough. *Quarterly Journal of Economics*, *128*(2), 469-530. doi:10.1093/qje/qjt005

Arellano, M., & Bond, S. (1991). Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations. *Review of Economic Studies*,

58(2), 277-297. doi:10.2307/2297968

Arellano, M., & Bover, O. (1995). Another Look at the Instrumental Variable Estimation of Error Component Models. *Review of Economic Studies*, *68*(1), 29-51. doi:10.1016/0304-4076(94)01642-D

Arnold, J., & Gammage, S. (2019). Gender and Financial Inclusion: The Critical Role for Holistic Programming. *Development in Practice*, *29*(8), 965-973. doi:10.1080/09614524.2019.1651251

Asiedu, E., Kalonda-Kanyama, I., Ndikumana, L., & Nti-Addae, A. (2013). Access to Credit by Firms in Sub-Saharan Africa: How Relevant is Gender? *American Economic Review: Papers & Proceedings*, *103*(3), 293-297. doi:10.1257/aer.103.3.293

Asongu, S. A., & Odhiambo, N. M. (2018). *ICT, Financial Access and Gender Inclusion in the Formal Economic Sector: Evidence from Africa* (Working Paper No. WP/18/058). African Governance and Development Institute.

Autor, D. H. (2015). Why Are There Still So Many Jobs? The History and Future of Workplace Automation. *Journal of Economic Perspectives*, *29*(3), 3-30. doi:10.1257/jep.29.3.3

Autor, D. H., & Dorn, D. (2013). The Growth of Low Skill Service Jobs and the Polarization of the U.S. Labor Market. *American Economic Review*, *103*(5), 1553-97. doi:10.1257/aer.103.5.1553

Balasubramanian, S. A., Kuppusamy, T., & Natarajan, T. (2019). Financial Inclusion and Land Ownership Status of Women. *International Journal of Development Issues*, *18*(1), 51-69. doi:10.1108/IJDI-06-2018-0091

Belluci, A., Borisov, A., & Zazzaro, A. (2010). Does Gender Matter in Bank–firm Relationships? Evidence from Small Business Lending. *Journal of Banking & Finance*, *34*(12), 2968-84. doi:10.1016/j.jbankfin.2010.07.008

Berik, G., Rodgers, Y. M., & Seguino, S. (2011). Feminist Economics of Inequality, Development, and Growth. In G. Berik, Y. M. Rodgers, & S. Seguino (Eds.), *Inequality, Development, and Growth* (p. 1-33). Routledge, London and New York. doi:10.1080/13545700903093524

Blundell, R., & Bond, S. (1998). Initial Conditions and Moment Restrictions in Dynamic Panel Data Models. *Journal of Econometrics*, *87*(1), 115-43. doi:10.1016/S0304-4076(98)00009-8

Bond, S., Hoeffler, A., & Temple, J. (2001). *GMM Estimation of Empirical Growth Models* (Working Paper No. 3048). Centre for Economic Policy Research (CEPR).

Buvinic, M., & Furst-Nichols, R. (2016). Promoting Women's Economic Empowerment: What Works? *The World Bank Research Observer*, *31*(1), 59-101. http://hdl.handle.net/10986/27699.

Chen, G., & Chen, S. (2016). Financial Development, Labor Participation, and Employment in Urban China. *Emerging Markets Finance and Trade*, *52*(3), 754-64. doi:10.1080/1540496X.2016.1116285

Connelly, R. (1992). The Effect of Child Care Costs on Married Women's Labor Force Participation. *Review of Economics and Statistics*, *74*(1), 83-90. doi:10.2307/2109545

Deléchat, M. C. C., Newiak, M. M., Xu, R., Yang, M. F., & Aslan, G. (2018). *What is Driving Women's Financial Inclusion Across Countries?* (Working Paper No. 1838). International Monetary Fund.

Demirgüç-Kunt, A., Honohan, P., & Beck, T. (2008). *Finance for All? Policies and Pitfalls in Expanding Access* (World Bank Policy Research Report). http://hdl.handle.net/10986/6905.

Demirgüç-Kunt, A., & Klapper, L. (2013). Measuring Financial Inclusion: Explaining Variation in Use of Financial Services across and within Countries. *Brookings Papers on Economic Activity*, *2013*(1), 279-340.

Demirgüç-Kunt, A., Klapper, L. F., & Singer, D. (2013). *Financial Inclusion and Legal Discrimination against Women: Evidence from Developing Countries* (World Bank Policy Research Working Paper No. 6416).

Demirgüç-Kunt, A., & Levine, R. (2009). Finance and Inequality: Theory and Evidence. *Annual Review of Financial Economics*, *1*(1), 287-318. doi:10.1146/annurev.financial.050808.114334

Ellis, A., Cutura, J., Dione, N., Gillson, I., Manuel, C., & Thongori, J. (2007). *Gender and Economic Growth in Kenya : Unleashing the Power of Women.* World Bank, Washington DC.

Fernandez, R., Fogli, A., & Olivetti, C. (2004). Mothers and Sons: Preference Formation and Female Labor Force Dynamics. *Quarterly Journal of Economics*, *119*(9), 1249-99. doi:10.1162/0033553042476224

Gornick, J. C., Meyers, M. K., & Ross, K. E. (1998). Public Policies and the Employment of Mothers: A Cross-National Study. *Social Science Quarterly*, *79*(1), 35-54.

Hallward-Driemeier, M. (2013). *Enterprising Women : Expanding Economic Opportunities in Africa.* World Bank, Washington DC.

Han, R., & Melecky, M. (2013). *Financial Inclusion for Financial Stability: Access to Bank Deposits and the Growth of Deposits in the Global Financial Crisis* (Policy Research Working Paper No. 6577). World Bank.

Kim, K. (2022). Assessing the Impact of Mobile Money on Improving the Financial Inclusion of Nairobi Women. *Journal of Gender Studies*, *31*(3), 306-22. doi:10.1080/09589236.2021.1884536

Kiviet, J. (1995). On Bias, Inconsistency, and Efficiency of Various Estimators in Dynamic Panel Data Models. *Journal of Econometrics*, *68*(1), 53-78. doi:10.1016/0304-4076(94)01643-E

Klapper, L. F., & Parker, S. (2011). Gender and the Business Environment for New Firm Creation. *The World Bank Research Observer*, *26*(2), 237-57. http://hdl.handle.net/10986/13515.

Klasen, S. (2002). Low Schooling for Girls, Slower Growth for All? Cross-Country Evidence on the Effect of Gender Inequality in Education on Economic Development. *World Bank Economic Review*, *16*(3), 345-73. doi:10.1093/wber/lhf004

Kırmızıoğlu, H., & Elveren, A. Y. (2022). *Financial Development and Female Labor Income Share: Evidence from Global Data* (MPRA Working Paper No. 112861).

Levine, R. (2021). *Finance, Growth, and Inequality* (IMF Working Paper No. 21/164).

Llussa, F. (2009). *Financial Development, Gender and Entrepreneurship* (MIT Engineering Systems Division Working Paper Series No. 18).

Morsy, H. (2020). Access to Finance – Mind the Gender Gap. *The Quarterly Review of Economics and Finance*, *78*, 12-21. doi:10.1016/j.qref.2020.02.005

Muravyev, A., Talavera, O., & Schäfer, D. (2009). Entrepreneurs' Gender and Financial Constraints: Evidence from International Data. *Journal of Comparative Economics*, *37*(2), 270-86. doi:10.1016/j.jce.2008.12.001

Naituli, G., Wegulo, F. N., & Kaimenyi, B. (2006). *Entrepreneurial Characteristics among Micro and Small-scale Women Owned Enterprises in North and Central Meru Districts, Kenya, Nairobi.* UNESCO.

Natile, S. (2019). Regulating Exclusions? Gender, Development and the Limits of Inclusionary Financial Platforms. *International Journal of Law in Context*, *15*(4), 461-78. doi:10.1017/S1744552319000417

Neef, T., & Robilliard, A.-S. (2021). *Half the Sky? The Female Labor Income Share in a Global Perspective* (World Inequality Lab – Working Paper No. 2021/22).

Nickell, S. (1981). Biases in Dynamic Models with Fixed Effects. *Econometrica*, *49*(6), 1399-416. doi:10.2307/1911408

Ohiomu, S., & Ogbeide-Osaretin, E. N. (2020). Financial Inclusion and Gender Inequality Reduction: Evidence from Sub-Saharan Africa. *The Indian Economic Journal*, *67*(3-4), 367-72. doi:10.1177/0019466220946411

Ostry, J. D., Alvarez, J., Espinoza, R., & Papageorgiou, C. (2018). *Economic Gains from Gender Inclusion: New Mechanisms, New Evidence* (IMF Staff Discussion Note No. 18/06).

Pesaran, M. H., Shin, Y., & Smith, R. P. (1999). Pooled Mean Group Estimation of Dynamic Heterogeneous Panels. *Journal of the American Statistical Association*, *94*, 621-34. doi:10.2307/2670182

Pesaran, M. H., & Smith, R. P. (1995). Estimating Long-run Relationships from Dynamic Heterogeneous Panels. *Journal of Econometrics*, *68*(1), 79-113. doi:10.1016/0304-4076(94)01644-F

Roberts, A. (2015). Gender, Financial Deepening and the Production of Embodied Finance: Towards a Critical Feminist Analysis. *Global Society*, *29*(1), 107-27. doi:10.1080/13600826.2014.975189

Roodman, D. (2006). *How to do xtabond2: An introduction to "Difference" and "System" GMM in Stata* (Center for Global Development (CGD) Working Paper No. 103).

Roodman, D. (2009). How to Do xtabond2: An Introduction to Difference and System GMM in Stata. *The Stata Journal*, *9*(1), 86-136. doi:10.1177/1536867X0900900106

Ruiz, C. (2013). *From Pawn Shops to Banks: The Impact of Formal Credit on Informal Households* (World Bank Policy Research Working Paper No. 6643).

Sahay, R., Čihák, M., & other IMF Staff. (2018). *Women in Finance: A Case for Closing Gaps* (IMF Staff Discussion Note No. 18/05).

Salman, A., & Nowacka, K. (2020). *Innovative Financial Products and Services for Women in Asia and the Pacific* (Asian Development Bank Sustainable Development Working Paper Series No. 67).

Schaner, S. (2016). *The Persistent Power of Behavioral Change: Long-Run Impacts of Temporary Savings Subsidies for the Poor* (NBER Working Paper No. 22534).

Suri, T., & Jack., W. (2016). The Long-run Poverty and Gender Impacts of Mobile Money. *Science*, *354*(6317), 1288-92. doi:10.1126/science.aah5309

Svirydzenka, K. (2016). *Introducing a New Broad-based Index of Financial Development* (IMF Working Paper No. 16/15).

Swamy, V. (2014). Financial Inclusion, Gender Dimension, and Economic Impact on Poor Households. *World Development*, *56*, 1-15. doi:10.1016/j.worlddev.2013.10.019

UN Women. (2021). *Gender Statistics for Evidence-Based Policies: Women's Economic Empowerment, Health and Gender-based Violence* (Report). Nairobi, Kenya: UN Women.

Appendix: Additional Tables

Table A.1: System GMM Estimation Results for Financial Development Index

	All	Low	Low middle	Lower	Upper middle	High
Lag(FLIS)	0.987***	1.004***	1.051***	0.974***	0.997***	1.005***
	(0.008)	(0.038)	(0.004)	(0.005)	(0.01)	(0.003)
Financial Development Index	0.008***	0.055	-0.028***	-0.013***	0.011**	0.008***
	(0.002)	(0.041)	(0.004)	(0.003)	(0.005)	(0.001)
GDP per capita	-0.024	-8.1	1.110***	1.830***	-0.195	-0.028
	(0.048)	(5.54)	(0.282)	(0.297)	(0.131)	(0.018)
Openness	-0.002**	-0.008	1.110***	1.830***	-0.195	-0.028
	(0.001)	(0.01)	(0.282)	(0.297)	(0.131)	(0.018)
Constant	0.004**	-0.001	-0.003***	0.005***	0.001	-0.001
	(0.002)	(0.008)	(0.001)	(0.001)	(0.003)	(0.001)
Observations	4,099	436	1,242	1,678	1,098	1,323
Countries	156	17	48	65	42	49
F-statistic	16,115.7***	612.1***	87,298.3***	19,066.9***	62,087.8***	111,945.7***
p-values for	0	0	0	0	0	0
AR(1)	0	0.003	0.001	0	0	0
AR(2)	0.131	0.122	0.407	0.104	0.856	0.823
Hansen	0.115	1.000	0.695	0.131	0.926	0.61
Diff-in-Hansen	0.472	1.000	0.355	0.227	0.627	0.425

Note: Standard errors in parenthesis. Significance is denoted by *** at 1%, ** at 5%, and * at 10% level.

Table A.2: System GMM Estimation Results for Financial Institutions Index

	All	Low	Low middle	Lower	Upper middle	High
Lag(FLIS)	0.977***	1.005***	1.051***	0.979***	0.998***	1.016***
	(0.007)	(0.036)	(0.006)	(0.005)	(0.01)	(0.005)
Financial Institution	0.013***	0.038	-0.015***	-0.006***	0.009**	0.024***
Index	(0.003)	(0.026)	(0.003)	(0.003)	(0.004)	(0.002)
GDP per capita	0.021	-7.74	0.864**	1.560***	-0.234*	-0.142***
	(0.034)	(5.61)	(0.322)	(0.384)	(0.131)	(0.028)
Openness	-0.005***	-0.001	-0.007***	0.001	-0.001**	-0.004***
	(0.001)	(0.003)	(0.001)	(0.001)	(0)	(0.001)
Constant	0.006***	-0.002	-0.003***	0.004***	0.001	-0.009***
	(0.001)	(0.008)	(0.001)	(0.001)	(0.002)	(0.001)
Observations	4,097	436	1,242	1,678	1,098	1,323
Countries	156	17	48	65	42	49
F-statistic	11,109.04***	672.52***	72,826.99***	51,987.26***	22,939.28***	123,476.73***
p-values for	0	0	0	0	0	0
AR(1)	0	0.003	0.001	0	0	0
AR(2)	0.138	0.116	0.379	0.1	0.646	0.547
Hansen	0.278	1.000	0.885	0.114	0.8	0.377
Diff-in-Hansen	0.741	1.000	0.517	0.196	0.844	0.36

Note: Standard errors in parenthesis. Significance is denoted by *** at 1%, ** at 5%, and * at 10% level.

Table A.3: System GMM Estimation Results for Financial Markets Index

	All	Low	Low middle	Lower	Upper middle	High
Lag(FLIS)	1.009***	1.016***	1.045***	0.994***	1.008***	1.006***
	(0.008)	(0.025)	(0.006)	(0.005)	(0.003)	(0.002)
Financial Markets	0.003	0.122	-0.015***	-0.005***	0.002	0.002***
Index	(0.002)	(0.089)	(0.001)	(0.002)	(0.003)	(0.001)
GDP per capita	-0.019	-9.330*	-0.876**	0.722***	0.144**	0.049**
	(0.047)	(4.27)	(0.195)	(0.159)	(0.063)	(0.018)
Openness	-0.003***	0.001**	-0.004***	0.001	0.001	-0.003***
	(0.001)	(0)	(0.001)	(0.001)	(0)	(0.001)
Constant	0.001	-0.007	-0.002***	0.001	-0.002**	0.001
	(0.001)	(0.007)	(0.001)	(0.001)	(0.001)	(0.001)
Observations	3,827	341	1,109	1,450	1,054	1,323
Countries	147	14	43	57	41	49
F-statistic	12,280.26***	764.90***	187,621.95***	16,623.51***	65,235.58***	107,655.74***
p-values for	0	0	0	0	0	0
AR(1)	0	0.005	0.002	0	0	0
AR(2)	0.14	0.105	0.453	0.092	0.7	0.82
Hansen	0.179	1.000	0.701	0.242	0.706	0.337
Diff-in-Hansen	0.275	1.000	0.516	0.332	0.586	0.282

Note: Standard errors in parenthesis. Significance is denoted by *** at 1%, ** at 5%, and * at 10% level.

Table A.4: System GMM Estimation Results for Financial Institutions Depth Index

	All	Low	Low middle	Lower	Upper middle	High
Lag(FLIS)	0.994***	0.986***	1.056***	0.943***	1.004***	1.004***
	(0.008)	(0.034)	(0.005)	(0.006)	(0.008)	(0.004)
Financial Institutions	0.011***	0.076**	-0.012***	0.036***	0.014**	0.009***
Depth Index	(0.002)	(0.026)	(0.004)	(0.005)	(0.006)	(0.001)
GDP per capita	-0.083*	-6.070***	-0.392	-0.738	-0.178	-0.044*
	(0.043)	(0.896)	(0.262)	(0.498)	(0.141)	(0.023)
Openness	-0.002***	0.002	-0.006***	0.003***	-0.001	-0.003***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Constant	0.003*	0.005	-0.005***	0.011***	-0.001	0.001
	(0.002)	(0.008)	(0.001)	(0.001)	(0.002)	(0.001)
Observations	4,076	436	1,242	1,678	1,077	1,321
Countries	155	17	48	65	41	49
F-statistic	18,889.56***	379.20***	348,246.73***	8,063.93***	37,609.22***	203,758.68***
p-values for	0	0	0	0	0	0
AR(1)	0	0.003	0.001	0	0	0
AR(2)	0.14	0.141	0.376	0.094	0.666	0.826
Hansen	0.138	1.000	0.611	0.17	0.838	0.43
Diff-in-Hansen	0.525	1.000	0.444	0.214	0.758	0.352

Note: Standard errors in parenthesis. Significance is denoted by *** at 1%, ** at 5%, and * at 10% level.

Table A.5: System GMM Estimation Results for Financial Institutions Access Index

	All	Low	Low middle	Lower	Upper middle	High
Lag(FLIS)	0.977***	1.005***	1.082***	0.973***	0.970***	1.013***
	(0.008)	(0.042)	(0.006)	(0.007)	(0.01)	(0.007)
Financial Institutions	0.011***	0.052***	-0.012***	0.005**	0.008***	0.017***
Access Index	(0.002)	(0.014)	(0.002)	(0.003)	(0.002)	(0.002)
GDP per capita	0.054*	-5.340***	0.769*	-0.069	-0.226*	-0.057***
	(0.031)	(1.08)	(0.417)	(0.504)	(0.123)	(0.015)
Openness	-0.006***	-0.003	-0.010***	0.001	-0.001**	-0.004***
	(0.001)	(0.002)	(0.001)	(0.001)	(0)	(0.001)
Constant	0.008***	0.002	-0.009***	0.005***	0.010***	-0.008***
	(0.002)	(0.01)	(0.001)	(0.001)	(0.003)	(0.002)
Observations	4,048	436	1,242	1,678	1,077	1,293
Countries	154	17	48	65	41	48
F-statistic	9,195.75***	1,924.95***	280,022.37***	26,314.76***	654,140.83***	142,410.40***
p-values for	0	0	0	0	0	0
AR(1)	0	0.003	0.001	0	0	0
AR(2)	0.163	0.157	0.376	0.096	0.652	0.899
Hansen	0.59	1.000	0.633	0.171	0.916	0.601
Diff-in-Hansen	0.821	1.000	0.379	0.328	0.603	0.429

Note: Standard errors in parenthesis. Significance is denoted by *** at 1%, ** at 5%, and * at 10% level.

Table A.6: System GMM Estimation Results for Financial Institutions Efficiency Index

	All	Low	Low middle	Lower	Upper middle	High
Lag(FLIS)	1.005***	0.978***	1.060***	0.978***	1.002***	1.007***
	(0.008)	(0.034)	(0.006)	(0.006)	(0.008)	(0.003)
Financial Institutions	-0.005**	0.016	-0.006***	-0.013***	-0.006**	-0.009***
Efficiency Index	(0.002)	(0.012)	(0.001)	(0.001)	(0.002)	(0.001)
GDP per capita	0.077*	-3.05	-0.467***	1.810***	0.337***	0.131***
	(0.039)	(4.55)	(0.127)	(0.196)	(0.096)	(0.021)
Openness	-0.003***	-0.004	-0.007***	0.001	-0.002***	-0.004***
	(0.001)	(0.003)	(0.001)	(0.001)	(0.001)	(0.001)
Constant	0.004***	-0.001	-0.002***	0.009***	0.003	0.005***
	(0.002)	(0)	(0.001)	(0.001)	(0.003)	(0.001)
Observations	4,097	436	1,242	1,678	1,098	1,321
Countries	156	17	48	65	42	49
F-statistic	13,378.60***	602.07***	374,226.17***	17,449.82***	17,129.81***	47,830.36***
p-values for	0	0	0	0	0	0
AR(1)	0	0.009	0.001	0	0	0
AR(2)	0.174	0.096	0.406	0.151	0.764	0.831
Hansen	0.162	1.000	0.761	0.143	0.834	0.496
Diff-in-Hansen	0.41	1.000	0.489	0.135	0.812	0.36

Note: Standard errors in parenthesis. Significance is denoted by *** at 1%, ** at 5%, and * at 10% level.

Table A.7: System GMM Estimation Results for Financial Markets Depth Index

	All	Low	Low middle	Lower	Upper middle	High
Lag(FLIS)	1.007***	1.009***	1.058***	0.998***	0.998***	1.014***
	(0.008)	(0.021)	(0.007)	(0.007)	(0.007)	(0.002)
Financial Markets	0.001	0.053	-0.018***	-0.009***	0.004	0.001
Depth Index	(0.001)	(0.035)	(0.003)	(0.003)	(0.003)	(0.001)
GDP per capita	-0.002	-9.480**	-1.020***	0.683***	0.103	0.034**
	(0.042)	(4.08)	(0.199)	(0.14)	(0.079)	(0.014)
Openness	-0.002***	0.007	-0.005***	0.001	0.001	-0.003***
	(0.001)	(0.004)	(0.001)	(0.001)	(0)	(0.001)
Constant	0.001	-0.001	-0.004***	0.001	0.001	-0.001
	(0.002)	(0.005)	(0.001)	(0.001)	(0.002)	(0.001)
Observations	3,825	341	1,109	1,450	1,054	1,321
Countries	147	14	43	57	41	49
F-statistic	14,776.55***	949.95***	105,824.22***	12,958.09***	55,026.98***	128,188.17***
p-values for	0	0	0	0	0	0
AR(1)	0	0.005	0.002	0	0	0
AR(2)	0.139	0.103	0.437	0.092	0.678	0.828
Hansen	0.132	1.000	0.614	0.297	0.738	0.326
Diff-in-Hansen	0.186	1.000	0.412	0.323	0.61	0.268

Note: Standard errors in parenthesis. Significance is denoted by *** at 1%, ** at 5%, and * at 10% level.

Table A.8: System GMM Estimation Results for Financial Markets Access Index

	All	Low	Low middle	Lower	Upper middle	High
Lag(FLIS)	1.008***	-1.469	1.006***	0.989***	0.975***	1.000***
	(0.007)	(2.229)	(0.013)	(0.009)	(0.014)	(0.005)
Financial Markets	-0.001	-0.648	0.008	0.001	-0.011**	-0.002***
Access Index	(0.001)	(1.644)	(0.009)	(0.004)	(0.004)	(0.001)
GDP per capita	0.053	-0.001	-0.141	0.650**	0.612**	0.119***
	(0.041)	(0.001)	(0.417)	(0.306)	(0.228)	(0.022)
Openness	-0.004***	0.002	-0.003	-0.002*	-0.001	-0.003***
	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)
Constant	0.002	NA	0.001	0.003***	0.008*	0.001
	(0.001)	(0)	(0.002)	(0.001)	(0.004)	(0.001)
Observations	2,956	93	708	801	835	1,320
Countries	109	4	26	30	30	49
F-statistic	17,812.1***	117.4***	6,926.1***	26,093.5***	16,922.4***	18,794.5***
p-values for	0	0	0	0	0	0
AR(1)	0	0.424	0.009	0.006	0.001	0
AR(2)	0.355	0.248	0.193	0.149	0.633	0.82
Hansen	0.099	1.000	0.999	0.988	0.999	0.309
Diff-in-Hansen	0.149	1.000	0.998	0.927	0.996	0.303

Note: Standard errors in parenthesis. Significance is denoted by *** at 1%, ** at 5%, and * at 10% level.

Table A.9: System GMM Estimation Results for Financial Markets Efficiency Index

	All	Low (NA)	Low middle	Lower	Upper middle	High
Lag(FLIS)	1.018***		0.999***	0.969***	0.975***	1.018**
	(0.008)		(0.033)	(0.025)	(0.009)	(0.006)
Financial Markets	0.003***		-0.003	-0.005	0.003	0.003***
Efficiency Index	(0.001)		(0.005)	(0.005)	(0.002)	(0.001)
GDP per capita	-0.032		1.080***	0.838***	0.451***	0.008
	(0.029)		(0.29)	(0.268)	(0.127)	(0.027)
Openness	-0.002***		-0.002	0.001	-0.001	-0.003***
	(0.001)		(0.003)	(0.003)	(0.001)	(0.001)
Constant	-0.002		0.001	-0.001	0.008***	-0.002**
	(0.002)		(0.006)	(0.004)	(0.002)	(0.001)
Observations	2,377		486	514	696	1,167
Countries	87		18	19	25	43
F-statistic	30,269.5***		2,389.8***	8,915.4***	5,983.3***	63,399.3***
p-values for	0		0	0	0	0
AR(1)	0		0.034	0.028	0.003	0
AR(2)	0.362		0.165	0.139	0.673	0.991
Hansen	0.184		1.000	1.000	0.993	0.666
Diff-in-Hansen	0.221		1.000	1.000	0.995	0.430

Note: Standard errors in parenthesis. Significance is denoted by *** at 1%, ** at 5%, and * at 10% level.