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What is Driving Women's Financial
Inclusion Across Countries?

Corinne Deléchat, Monique Newiak, Rui Xu, Fan Yang, and Göksu Aslan

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I N T E R N A T I O N A L M O N E T A R Y F U N D

IMF Working Paper

African Department

What is Driving Women's Financial Inclusion Across Countries?¹

**Prepared by Corinne Deléchat*, Monique Newiak*, Rui Xu*,
Fan Yang+, and Göksu Aslan#**

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Abstract

Using a broad set of macroeconomic country characteristics to supplement a new and comprehensive micro-level dataset for 140 countries, we identify structural factors, policies, and individual characteristics that are associated with financial inclusion—in general, and for women in particular. We find that structural country characteristics, such as resource-richness and level of development, and policies, such as stronger institutions, and financial development are significantly related to financial inclusion. We find a robust negative relationship between being female and financial inclusion as in previous studies, and our analysis points to legal discrimination, lack of protection from harassment, including at the work place, and more diffuse gender norms as possible explanatory factors.

JEL Classification Numbers: D14, E21, G21, G28, J16

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I. INTRODUCTION²

1. **A large number of studies discuss the important macroeconomic consequences of financial inclusion, motivating deeper analysis of the drivers of financial access.** Having a bank account increases individual savings (Aportela, 1999), female empowerment (Ashraf and others, 2010), consumption and productive investment of entrepreneurs (Dupas and Robinson, 2009), and income for the poor, in particular women (Swamy 2013). There is increasing evidence linking financial inclusion with higher growth (Beck and Demirguc-Kunt, 2008, Konte, 2016), lower income inequality (Aslan and others, 2017, Beck and Demirguc-Kunt, 2008, Classens and Perotti, 2007, Gine and Townsend, 2004, Mockerjee and Kalipioni, 2011, Townsend and Ueda, 2006), and lower aggregate consumption volatility (Mehrotra and Yetman, 2015). Greater financial inclusion through broader access and use of deposits can significantly mitigate deposit withdrawals during times of financial stress (Han and Melecky, 2013). However, there may also be tradeoffs between financial stability and growth as not everybody that is newly included financially will increase asset quality (Cihak and others, 2016; Sahay and others, 2015).

2. **Financial inclusion is not gender-neutral, with large gaps in access levels between men and women in most countries.** The gender gap in financial access systematic and persistent (Allen and others, 2012; Demirguc-Kunt and Klapper, 2013, 2012a, 2012b). Worldwide, only 37 percent of women have a formal bank account compared with 46 percent of men, and the difference is persistent across all income groups in developing countries. These gender gaps have implications for women's labor force participation, in particular entrepreneurship as they restrict women's economic opportunities (Gonzales and others, 2015b). Indeed, the literature on banking and entrepreneurship also provides evidence of gender discrimination in entrepreneurs' ability to obtain a loan (Bellucci and others, 2010, Muravyev and others, 2009, Klapper and Parker, 2010). Accordingly, there is an extensive microeconomic and cross-country literature on women and financial inclusion, reviewed for example in Aterido and others 2013, Demirguc-Kunt and others, 2013, and Swamy, 2013.

3. **Our study therefore aims at understanding what is driving financial inclusion, in particular for women, at both the individual and the cross-country level.** To answer this question, we proceed in three steps. First, to examine which demographic characteristics explain financial inclusion at the personal level, we use a rich world-wide micro-data set covering more than 140,000 individuals (the World Bank's Findex database³) to exploit jointly various aspects of access to financial services at the individual level. Second, we

² We thank Jorge Alvarez, Martin Cihak, Suhaib Kebhaj, Leandro Medina, Jennifer Mbabazi Moyo, Chris Papageorgiou, Axel Schimmelfennig, Nelson Sobrinho and participants at the Western Economic Association International Conference in Santiago, Chile in January 2017 and at two IMF seminars for their helpful comments. All remaining errors are our own.

³ The Findex database is based on a worldwide survey of representative of 1,000 individuals in over 140 countries associated with the GALLUP world poll, containing comparable information in access to a broad range of financial services and the intensity of their use. So far two waves of the Findex have been conducted, in 2011 and 2014, with a plan to conduct new surveys every three years.

combine microeconomic data on individual demographic characteristics with macroeconomic data to identify key drivers and possible policy levers of financial inclusion across countries. Third, we examine the determinants of financial inclusion jointly and separately for men and women. Combining the microeconomic and macroeconomic information, allows us to find strong evidence that higher coverage of legislative protection against harassment and the provision of basic economic rights, are associated with higher financial inclusion for women. Our findings also highlight the importance of education for men and women alike.

4. **We base our analysis on an index of formal financial inclusion as well as single measures of formal financial access in robustness checks.** This study is the first to use the multi-dimensional index introduced by Aslan and others (2017)—that captures financial access as a multi-dimensional concept—to highlight possible drivers of financial inclusion at the individual level.

- Most early studies have used univariate measures such as formal bank account ownership to measure financial inclusion (Allen and others, 2012, Demirguc-Kunt and Klapper, 2012, Demirguc-Kunt and others, 2013), or other supply-side data such as number of bank branches, ATMs and number of bank accounts (Beck and others, 2007; Honohan, 2007; Mookerjee and Kalipioni, 2011).
- However, financial inclusion is increasingly analyzed and understood as a multi-dimensional concept encompassing access, depth and efficiency (Dabla Norris and others, 2015a; Sahay and others, 2015). Among the recent papers that construct indices to capture some of these dimensions (e.g. Amidzic and others, 2014), the financial development index developed by Sviridyzenka (2016) is probably the broadest. It provides a relative ranking of 176 countries on the depth, access (measured from the supply side, based on financial infrastructure), and efficiency of their financial institutions and financial markets, annually for 1980–2013. The multi-dimensional index of financial inclusion based on demand-side information as constructed in Aslan and others (2017) complements that measure.

5. **Adding macroeconomic characteristics at the country or regional level allows us to gather insights on common drivers of financial inclusion in a country and thus relevant policy levers.** Cross-country studies of the drivers of financial inclusion or exclusion focus on microeconomic determinants, including individual characteristics (Zins and Weill, 2016) and self-reported barriers such as banking costs, distance to providers (Allen and others, 2012; Demirguc-Kunt and Klapper, 2012a). However, both studies note that country-wide factors such as income level also explain a significant share of financial inclusion. While account penetration is quasi universal in advanced economies (income levels beyond US\$15,000), a restriction of the analysis to the bottom 50 percent of economies by income level leads to GDP per capita only explaining 22 percent of the variation in account penetration.

6. **We similarly find strong evidence of gender bias in our regressions, which is robust to the inclusion of a comprehensive set of individual and country-level**

controls. Policies or programs that focus on enhancing women’s access to financial services can thus have significant positive welfare effects, as women tend to use the resources in such ways that improve the household’s well-being and contribute to significant increases in households’ savings levels (Aguirre and others 2012; Miller 2008).

7. **We find that legal discrimination against women and gender norms explain part of the cross-country variation in access to finance for women.** This is consistent with Demirguc-Kunt and others (2013), who find that legal restrictions on women’s right to work, to head a household, to hold property and to inherit, make women, relative to men, less likely to own an account, as well as to save and borrow and to use the full variety of financial services in the country. Our results are also in line with their finding that gender norms contribute to explaining the variation in the use of financial services between men and women, after controlling for other individual and country characteristics.

8. **In contrast with Demirguc-Kunt and others (2013), where the focus is on developing countries, we use a global sample of the extended 2014 Findex database.** This database covers a larger set of countries and captures a more comprehensive set of questions on financial inclusion. We also control for a large set of country characteristics in addition to legal restrictions, such as being resource-rich, and a wide range of policy-relevant indicators, such as overall level of education, the quality of institutions, financial depth in the economy. To explain access to finance by women, we control for a large set of social norms and gender-specific policies.

9. **Evidence of gender bias in financial inclusion could help explain the relationship between gender inequality and macroeconomic outcomes.** The recent literature on the macroeconomic effects of gender finds that inequality of economic opportunities for women, such as inequality in access to education and health is associated with lower growth and higher income inequality, particularly in developing countries (Klasen 1999; Klasen and Lamanna 2009; Gonzales and others 2015b, Hakura and others 2016, IMF 2015, World Bank 2011). Aslan and others (2017) find a strong association between gender inequality in financial access and overall income inequality.

10. **The rest of the paper is organized as follows.** Section II introduces the data and key stylized facts. Section III summarizes the construction of the financial inclusion index, based on Aslan and others (2017). Section IV presents the empirical methodology and discusses the estimation results. Section V concludes.

II. DATA AND STYLIZED FACTS: DIVING THROUGH 140,000 OBSERVATIONS

A. Data and Financial Inclusion Index

Dataset

11. **This paper builds on the rich micro-level information of the 2014 World Findex survey, which is attached to the Gallup world poll.** The dataset contains 146,688

individual observations that are randomly selected and nationally representative of 142 countries. It complements information on financial inclusion collected from the supply side, such as the [Financial Access Survey](#) that has recently been expanded to include gender-disaggregated data. The Findex survey questionnaire comprises 44 questions relating to financial inclusion in addition to questions on individual demographics, covering (i) access to different types of financial services; (ii) use of financial services, through saving and borrowing, formally and informally; (iii) reasons for financial exclusion; (iv) reasons to use financial services, and (v) individual characteristics, including gender, educational attainment, income quintile, age, and formal and government employment.

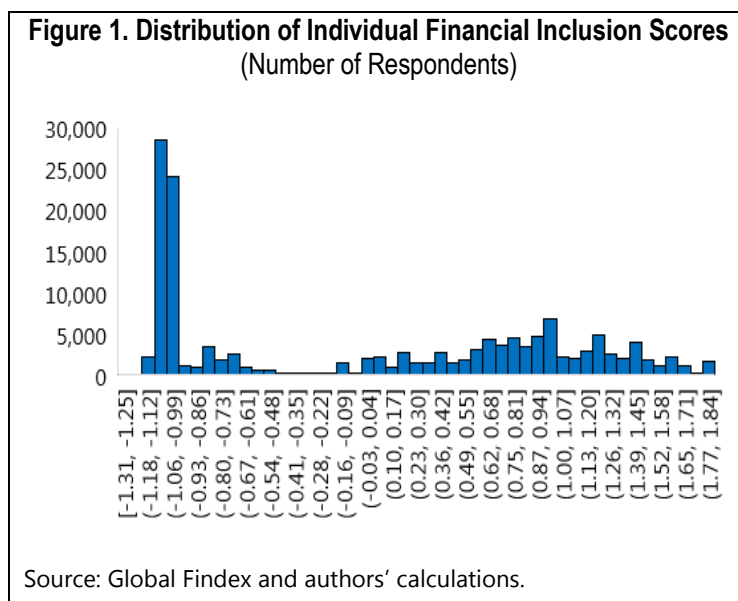
An Index of Financial Inclusion

12. **We use the index of financial inclusion introduced in Aslan and others (2017) to capture the information on the various types of access to financial services and their intensity.** That paper used correspondence analysis, the principal component analysis equivalent for categorical data, to construct an index of financial inclusion from 12 questions (whose weight is determined by the analysis) which are directly related to financial access and do not include information on individuals' personal characteristics or environment (Table 1). The index is preferable to one-dimensional measures of financial inclusion, such as having an account at a financial institution (Q1), as it also captures the intensity of the use of such services (e.g. if payments are made, the individual borrowed or saved etc.) as they are more closely linked to the goal of financial services and, ultimately, economic activity by individuals.

	Question	Possible Responses
Q1	Has an account	Yes/No/missing
Q3	If has a debit card, card is in own name	Yes/No/missing
Q4	If has a debit card, used card in the last 12 months	Yes/No/missing
Q6	If has a credit card, used card in the last 12 months	Yes/No/missing
Q9	If has an account, made deposit into account in the last 12 months	Yes/No/missing
Q11	If has an account, made withdrawal in the last 12 months	Yes/No/missing
Q14	If has an account, made transaction with mobile phone	Yes/No/missing
Q16	Made Internet Payments	Yes/No/missing
Q18a	Saved at financial institution in the last 12 months	Yes/No/missing
Q20	Borrowed from financial institution in the last 12 months	Yes/No/missing
Q21a	Has loan from financial institution for house, apartment, or land	Yes/No/missing
Q24 ⁴	Possibility of coming up with emergency funds	Very possible/Somewhat Possible/Not very possible/Not at all possible/missing

⁴ We used a modified version of Q24. The responses "Very possible" and "Somewhat Possible" were combined as a category "Very or somewhat possible", while "Not very possible" and "Not at all possible" were combined as "Not very or at all possible".

13. **The index provides a sense of the intensity of the use of financial services, with the distribution of scores across individuals skewed towards low-level scores.** A higher inclusion score is attributed to an individual having access to more services and having access to rarer services. Figure 1 highlights the distribution of individual scores across bins for the 2014 index: While the intensity of financial inclusion is relatively equally distributed at higher levels of financial inclusion, it is concentrated in two bins on the low inclusion side, mainly driven by low-income countries, in particular sub-Saharan African ones.



B. Stylized Facts

14. **Financial access varies strongly across income groups but gender gaps in financial access persist across all development levels.** Figure 2 depicts, by countries' level of development, access to financial services as measured by having an account at a financial institution.⁵ Financial access along this dimension increases with countries' income level. Gender gaps in financial access persist in middle-income and low-income countries. In advanced economies, access to an account is similar for men and women. At each level of a country's development, the rich have greater access to financial services. Finally, higher levels of education are associated with greater financial access across countries. These differences are statistically economically significant individually, both also jointly, as shown in the later regression analysis.

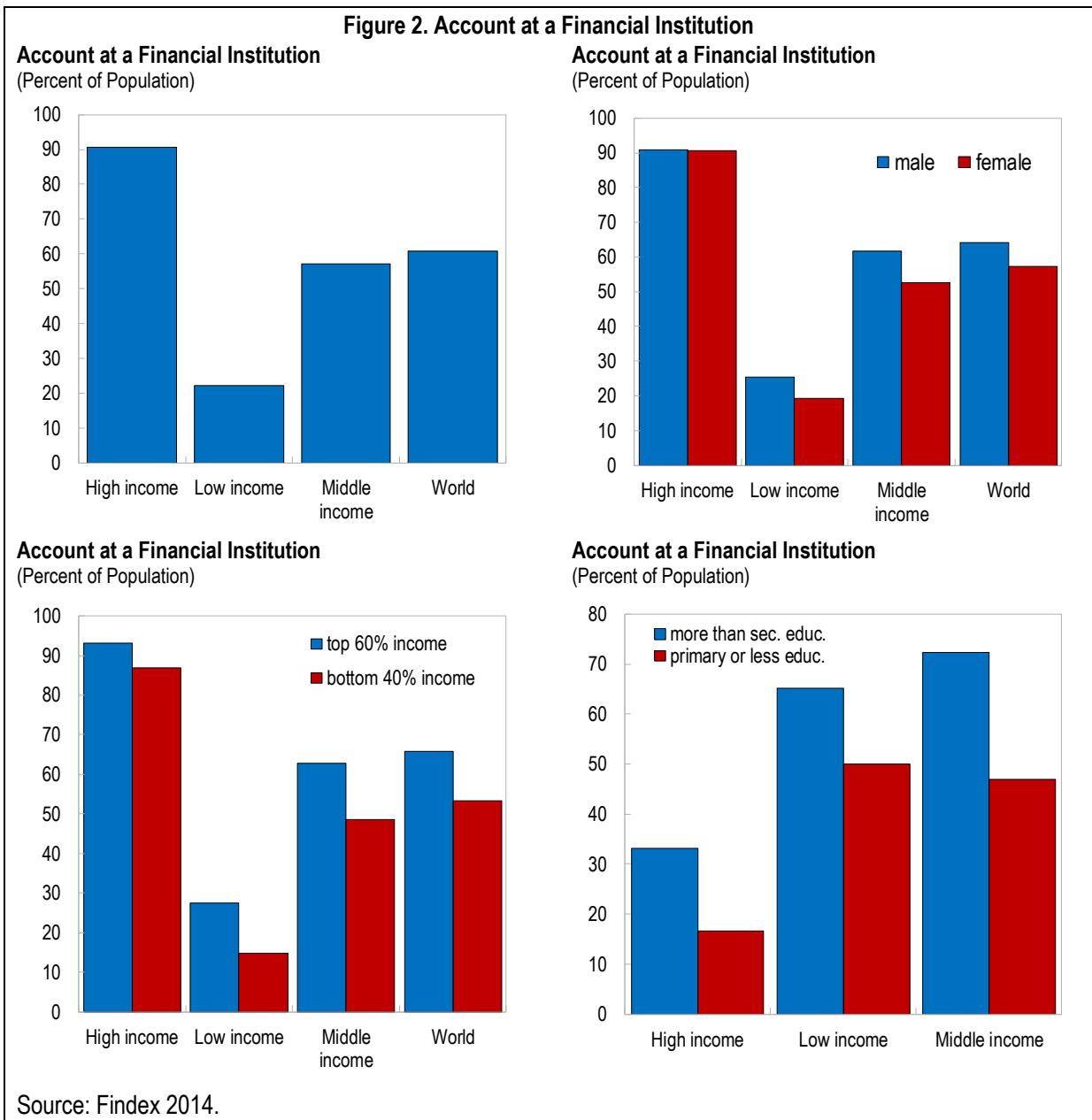
15. **In each country income group, individual characteristics are strongly related with access to our composite measure of access to financial services.** Figure 3 depicts the level of individual financial access scores by individual characteristics, at the global level, in emerging and developing countries, and for sub-Saharan Africa, with the following main results:

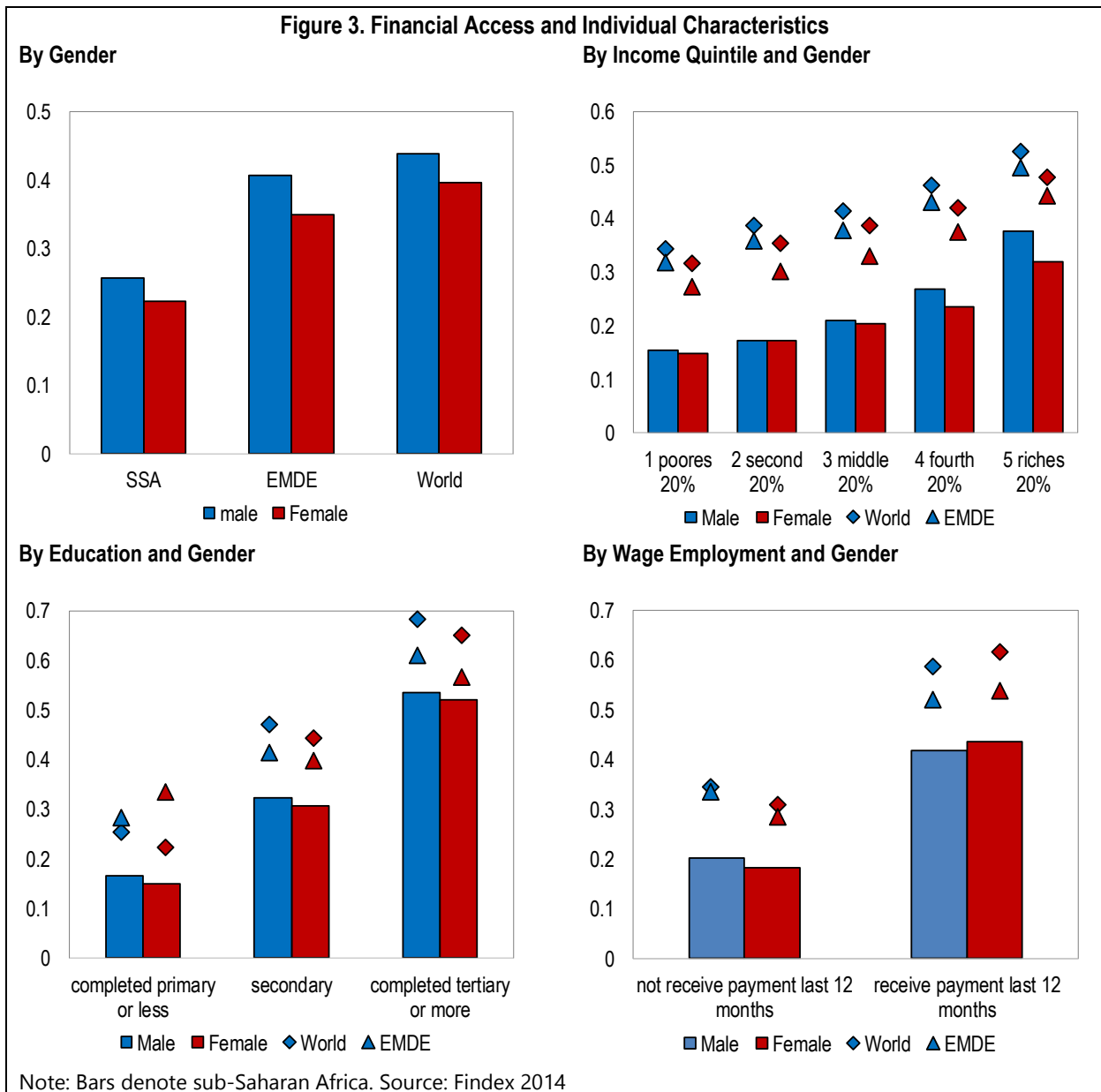
- Worldwide, women are less likely to access financial services than men, although the differences are larger for emerging and developing markets.
- Higher individual income is strongly associated with higher financial inclusion but the gender gap remains significant even among the richest 40 or even 20 percent. Indeed, in

⁵ Figures for saving and borrowing (not shown) at a financial institution yield similar results.

sub-Saharan Africa, where access levels are among the lowest in the world, financial access is equally low for men and women at the lower end of the income distribution.

- Financial access significantly increases with educational attainment, but the gender gap persists at higher levels of education.
- Finally, financial access is significantly higher for individuals that receive wage payments or are employed in the public sector. In the latter case, financial inclusion scores are higher for women than for men.
- These differences are statistically and economically significant individually, but also jointly, as shown in the later regression analysis.



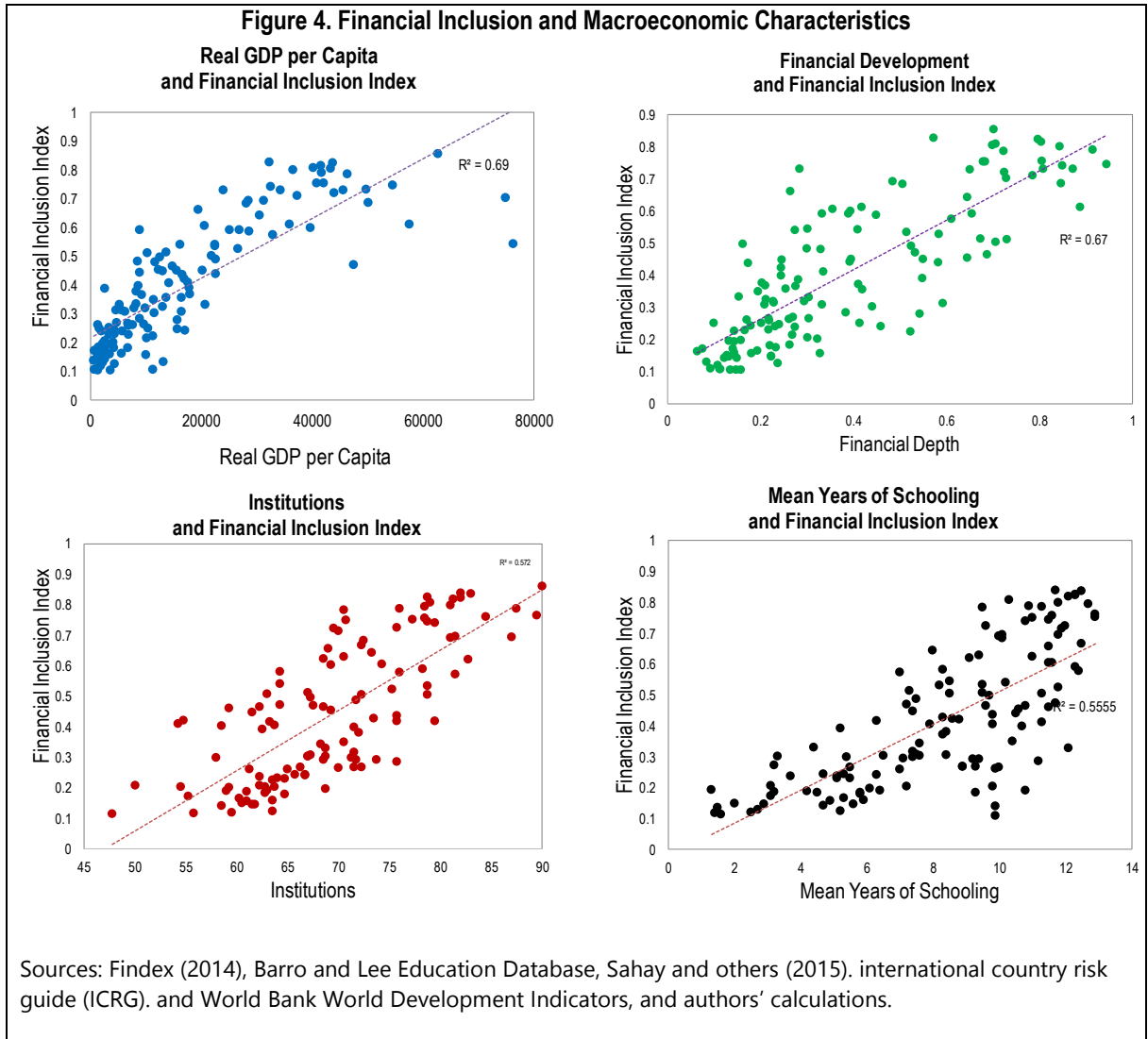


16. At the macro-level, financial inclusion varies strongly with countries' structural characteristics and policies (Figure 4).

- Development, as measured by income per capita, is strongly associated with higher financial access, as measured by our composite index.
- Financial development, which is a composite measure of financial depth, efficiency and access, capturing supply side elements (such as the density of ATMs and bank branches in the country) of financial inclusion, is closely related to our index of financial inclusion that measures the demand side of financial access, that is the extent and depth to which individuals are using financial inclusion. More efficient systems and more widely available financial infrastructure should facilitate individuals' de facto access to financial

services. In turn, higher access to financial services would also provide incentives for financial infrastructure to develop.

- At the same time, a stronger business environment, captured by the international country risk guide measure of perceived quality of institutions, is closely related to higher degrees of financial inclusion.
- A higher level of aggregate human capital, as measured by the average number of years of schooling in each country, is strongly related to higher financial inclusion.



III. EMPIRICAL STRATEGY AND RESULTS

A. Empirical Strategy

17. **Based on the above stylized facts, we combine the detailed information on individuals from the Findex database with macroeconomic data in an empirical estimation.** For a description of the country sample and variables, see Annex II and III, respectively. In particular, we estimate the following relationship across countries (j) and individuals (i) with ordinary least squares (OLS), and clustered standard errors at the country level to take into account that country-level variables do not vary at the individual level:

$$\text{Financial Inclusion}_{ij} = \beta' \text{Demographics}_{ij} + \gamma' \text{WageEmployed}_{ij} + \rho' \text{Structural}_j + \tau' \text{Policies}_j + \varepsilon_{ij}.$$

In this specification, the variable are defined as follows:

- *Financial Inclusion*_{ij} reflects our measures of financial inclusion. We use both binary information (having an account institution) in OLS and probit regressions, and our index on the intensity of financial inclusion.
- *Demographics*_{ij} capture the individual's demographic characteristics, such as gender, education, age and income level. Given inequality in property and inheritance rights and other factors restrict women's financial access, we expect a negative relationship with gender in the regression, but a positive relationship with education and income. We expect a non-linear relationship with age, as economic activity and the need for financial access would be mostly concentrated in the working-age population.
- *WageEmployed*_{ij} adds to the individual characteristics the employment status of whether the individual has received wage payments in the last 12 months, as a proxy for formal vs. informal employment. We expect this measure to be positively related to financial inclusion as salary payments for wage employed employees are more likely to be transferred through the banking system, requiring employees to open accounts at a financial institution.
- *Structural*_j are structural country characteristics, including the level of development (GDP per capita), the structure of the economy (captured by oil-exporter status), and population density. The higher the economy's development and the lower the population density, the higher we expect financial inclusion to be. In countries with a large oil sector, we expect financial inclusion to be lower, as the share of the workers in the extractive industries are lower compared to other sectors.
- *Policies*_j represent policies at the country level, comprising both general policies and those which affect women in particular:
 - For all individuals, we include the aggregate level of human capital (average years of schooling) as financial access should not only depend on the individual's educational attainment but also the average level of education in a country (e.g. proxy for other

firms and individuals' capacity to repay their loans and make business decisions). The level of financial development (measured by financial depth, the supply side of financial access and the efficiency of the financial sector, Sahay and others, 2015; Svirydzenka, 2016) is included to capture the provision of financial infrastructure. Measure of the quality of the business environment into the regressions capture the risks in which firms and individuals operate. All of these indicators are expected to be positively related to financial inclusion.

- To explain female financial inclusion, we test for the effect of legal rights on women's financial inclusion through two measures: the presence of different legislations against violence and harassment in the country and an index of general economic rights for women from the Women, Business and the Law database (World Bank 2014). To capture social norms, we include different aspects of the Social Institutions and Gender Index in the specifications. We expect stronger legal rights for and positive attitudes towards women to be associated with higher financial inclusion.
- To capture differentiated effects of structural characteristics and policies on women, we restrict the sample to female individuals and alternatively interact all variables with a dummy variable (1 if female) as a robustness check.

B. Results

18. The results, based on the index of the intensity of financial inclusion, show that structural country characteristics and policies matter for financial inclusion, in addition to individual characteristics.

- Individual characteristics are strongly associated with financial inclusion at the micro-level. Men, individuals at the higher end of the income distribution and those employed in the formal sector, as proxied by individuals having received wages in the last 12 months, have a higher intensity of using financial services (Table 2, column (1)). Interestingly, the relatively small coefficient on “female” (albeit statistically significant) highlights that other inequalities of opportunity and factors are contributing to driving the large gender gap in financial access highlighted earlier in the text. For example, equalizing education levels for men and women could help narrow the gender gap in financial access significantly, with being female—everything else equal—lowering an individual's financial inclusion score by just 0.01 points.
- In addition, structural characteristics matter (Table 2, column (2)). Higher levels of development, as measured by GDP per capita, are strongly related to higher financial inclusion. Oil-exporters, on the contrary, exhibit lower average levels of financial inclusion, likely reflecting lower levels of diversification in these countries as well as idiosyncratic financing options for the oil sector (such as through foreign-owned firms).

- Policies can play a significant role in advancing financial inclusion at all country income levels (Table 2, column (3)). Greater financial development and stronger levels of institutions are all strongly associated with higher levels of financial inclusion.
- These results hold when we include dummies capturing countries' income groups (Table 2, column (4)), regional dummies (Table 2, column (5)), and other measures of institutional quality (Table 2, columns (6) and (7)). In other specifications, we also include variables that are later used to explain female financial inclusion and exclude the overall years of schooling from the final regressions (not shown), and the results are robust to these modifications.

19. **Laws against harassment, including at the workplace, help explain women's financial inclusion, in addition to these general factors.** Individual and structural characteristics are associated with female financial inclusion in a similar way as in the global sample (Table 3, columns (1) and (3)). Better institutions, and higher financial development, and less resource-dependence are positively associated with female financial inclusion (Table 3, column (3)). In addition, however, legal protection—in the form of civil remedies against harassment in general, and at the workplace in particular, are significantly related to female financial inclusion (Table 3, columns (4) to (9)). A legal environment that provides safe conditions to be economically active, will increase their economic participation and bargaining power, translating in higher demand to access financial services. Our results are robust to inclusion of interaction terms into the specification using the full sample, as well as when we replace our financial inclusion index regressions with probit estimation on the likelihood of having an account at a financial institution (Annex VI).

20. **More generally, social norms and societal attitudes towards gender matter for women's financial inclusion, in addition to legal rights.** In line with other studies (see for example Demirguc-Kunt and others (2013)), we show that stronger legal rights and positive attitudes towards women, are related to stronger financial inclusion by women in both the global and emerging and developing economies (EMDE) sample, although with reduced significance levels for the latter due to decreasing sample size (Table 4). In particular, overall gender discrimination as measured by the Social Institution and Gender Index (SIGI) but also its individual components, such as a stronger son bias, and a more discriminatory family code, and more restricted civil liberties are associated with lower financial inclusion by women.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<u>Individual characteristics</u>							
Female	-0.011** (0.005)	-0.023*** (0.003)	-0.023*** (0.004)	-0.022*** (0.004)	-0.019*** (0.004)	-0.024*** (0.004)	-0.020*** (0.004)
Secondary education	0.220*** (0.015)	0.106*** (0.009)	0.123*** (0.007)	0.118*** (0.007)	0.118*** (0.006)	0.122*** (0.007)	0.114*** (0.006)
Age	0.009*** (0.001)	0.009*** (0.001)	0.009*** (0.001)	0.009*** (0.000)	0.009*** (0.001)	0.009*** (0.001)	0.009*** (0.001)
Age squared	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)
Wage employment	0.213*** (0.009)	0.144*** (0.008)	0.138*** (0.007)	0.132*** (0.007)	0.134*** (0.007)	0.136*** (0.007)	0.137*** (0.008)
Top 20 percent income	0.052*** (0.006)	0.083*** (0.004)	0.083*** (0.005)	0.084*** (0.005)	0.082*** (0.005)	0.084*** (0.005)	0.084*** (0.004)
<u>Country characteristics</u>							
Population density		0.000 (0.001)	-0.001 (0.000)	-0.001** (0.000)	0.000 (0.001)	-0.000 (0.000)	-0.001 (0.001)
GDP p.c.		0.127*** (0.007)	0.078*** (0.019)	0.070** (0.029)	0.097*** (0.021)	0.060*** (0.017)	0.056*** (0.014)
Fuel Exporter		-0.132*** (0.024)	-0.070*** (0.026)	-0.058* (0.031)	-0.054** (0.026)	-0.030 (0.025)	-0.021 (0.022)
<u>Policies</u>							
Mean years of schooling			0.002 (0.005)	0.001 (0.005)	0.003 (0.005)	-0.001 (0.005)	-0.004 (0.004)
Financial development			0.213*** (0.044)	0.199*** (0.054)	0.134** (0.058)	0.229*** (0.049)	0.208*** (0.051)
Institutions (ICRG)			0.003** (0.001)	0.002 (0.002)	0.001 (0.002)		
Political risk (ICRG)						0.005*** (0.001)	
Corruption Perceptions Index 2014							0.004*** (0.001)
Constant	-0.076*** (0.017)	-1.053*** (0.063)	-0.926*** (0.116)	-0.714*** (0.196)	-0.920*** (0.143)	-0.839*** (0.108)	-0.647*** (0.092)
Income dummies	NO	NO	NO	YES	NO	NO	NO
Regional dummies	NO	NO	NO	NO	YES	NO	NO
Adjusted R squared	0.321	0.479	0.485	0.504	0.504	0.491	0.508
Standard errors in parentheses * p<0.10; ** p<0.05; *** p<0.010							
Note: Regional dummies include East Asia Pacific, Europe and Central Asia (developing only), Latin America and Caribbean (developing only), Middle East and North Africa, OECD, South Asia, and sub-Saharan Africa.							

Table 3. Determinants of the Financial Inclusion Index – Restricted to Female Sample

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Individual characteristics									
Secondary education	0.212***	0.102***	0.115***	0.133***	0.114***	0.117***	0.133***	0.115***	0.118***
	-0.015	-0.009	-0.007	-0.008	-0.007	-0.006	-0.008	-0.007	-0.006
Age	0.008***	0.007***	0.007***	0.010***	0.007***	0.007***	0.010***	0.007***	0.007***
	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
Age squared	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***
	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Wage employment	0.241***	0.169***	0.160***	0.139***	0.148***	0.151***	0.139***	0.148***	0.151***
	-0.01	-0.009	-0.01	-0.008	-0.008	-0.008	-0.008	-0.008	-0.008
Top 20 percent income	0.044***	0.077***	0.078***	0.080***	0.079***	0.077***	0.080***	0.079***	0.077***
	-0.006	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005
Country characteristics									
Population density		0.000	0.000	-0.001	-0.001***	0.000	-0.001	-0.001***	0.000
		-0.001	0.000	-0.001	0.000	-0.001	-0.001	0.000	-0.001
GDP p.c.		0.127***	0.067***	0.085***	0.080***	0.094***	0.084***	0.077***	0.093***
		-0.008	-0.02	-0.02	-0.029	-0.022	-0.02	-0.029	-0.022
Fuel Exporter		-0.139***	-0.081***	-0.049	-0.053**	-0.043*	-0.051*	-0.054**	-0.044*
		-0.021	-0.023	-0.03	-0.026	-0.023	-0.03	-0.026	-0.024
Policies									
Mean years of schooling			0.005	-0.001	0.002	0.005	0.000	0.002	0.005
			-0.006	-0.005	-0.005	-0.006	-0.005	-0.005	-0.006
Financial development			0.209***	0.168***	0.184***	0.118**	0.165***	0.180***	0.116**
			-0.048	-0.047	-0.051	-0.054	-0.048	-0.051	-0.054
Institutions (ICRG)			0.004**	0.003*	0.002	0.000	0.003*	0.002	0.000
			-0.002	-0.002	-0.001	-0.002	-0.002	-0.001	-0.002
Legal rights									
Civil remedies for sexual harassment				0.032*	0.054***	0.055***			
				-0.019	-0.017	-0.016			
Civil remedies for sexual harassment in employment							0.030	0.053***	0.057***
							-0.019	-0.017	-0.017
Constant	-0.058***	-1.030***	-0.876***	-0.999***	-0.782***	-0.867***	-0.994***	-0.768***	-0.867***
	-0.017	-0.067	-0.128	-0.106	-0.187	-0.144	-0.105	-0.185	-0.146
Income dummy	NO	NO	NO	NO	YES	NO	NO	YES	NO
Regional dummy	NO	NO	NO	NO	NO	YES	NO	NO	YES
Adjusted R squared	0.337	0.485	0.491	0.48	0.518	0.518	0.478	0.518	0.518

Standard errors in parentheses

* p<0.10, ** p<0.05, *** p<0.010

Note: Regional dummies include East Asia Pacific, Europe and Central Asia (developing only), Latin America and Caribbean (developing only), Middle East and North Africa, OECD, South Asia, and sub-Saharan Africa.

Table 4. Determinants of Financial Inclusion Index—Accounting for Social Norms and Legal rights

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Global	EMDE	Global	EMDE	Global	EMDE	Global	EMDE	Global	EMDE
Individual characteristics										
Female	-0.025*** (0.005)	-0.023*** (0.005)	-0.026*** (0.004)	-0.024*** (0.005)	-0.021*** (0.004)	-0.022*** (0.005)	-0.025*** (0.004)	-0.022*** (0.005)	-0.023*** (0.004)	-0.024*** (0.005)
Secondary education	0.114*** (0.008)	0.107*** (0.008)	0.122*** (0.007)	0.104*** (0.008)	0.117*** (0.007)	0.105*** (0.008)	0.124*** (0.007)	0.106*** (0.008)	0.117*** (0.007)	0.106*** (0.008)
Age	0.009*** (0.001)	0.009*** (0.001)	0.009*** (0.001)	0.009*** (0.001)	0.009*** (0.001)	0.009*** (0.001)	0.009*** (0.001)	0.009*** (0.001)	0.009*** (0.001)	0.009*** (0.001)
Age squared	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)
Wage employment	0.145*** (0.009)	0.143*** (0.009)	0.136*** (0.007)	0.146*** (0.009)	0.141*** (0.008)	0.144*** (0.009)	0.137*** (0.007)	0.148*** (0.009)	0.138*** (0.008)	0.141*** (0.009)
Top 20 percent income	0.094*** (0.006)	0.102*** (0.006)	0.084*** (0.005)	0.104*** (0.006)	0.084*** (0.005)	0.101*** (0.006)	0.083*** (0.005)	0.103*** (0.006)	0.085*** (0.005)	0.102*** (0.006)
Country characteristics										
Population density	0.001 (0.006)	0.001 (0.005)	-0.001 (0.001)	0.004 (0.005)	0.001 (0.006)	0.001 (0.006)	-0.001 (0.000)	-0.001 (0.005)	0.006 (0.007)	0.007 (0.006)
GDP p.c.	0.063** (0.026)	0.040* (0.023)	0.077*** (0.018)	0.043* (0.023)	0.065** (0.025)	0.036 (0.025)	0.078*** (0.018)	0.045* (0.023)	0.065*** (0.024)	0.039 (0.023)
Fuel Exporter	-0.046 (0.031)	-0.011 (0.029)	-0.060** (0.028)	-0.016 (0.029)	-0.070** (0.030)	-0.019 (0.029)	-0.056** (0.024)	-0.016 (0.026)	-0.061* (0.031)	-0.006 (0.027)
Mean years of schooling	-0.003 (0.008)	-0.004 (0.007)	-0.005 (0.007)	-0.007 (0.008)	0.002 (0.006)	0.002 (0.007)	-0.000 (0.005)	-0.001 (0.007)	-0.005 (0.008)	-0.006 (0.008)
Policies										
Financial development	0.236*** (0.066)	0.268*** (0.077)	0.213*** (0.044)	0.240*** (0.072)	0.273*** (0.063)	0.310*** (0.082)	0.205*** (0.044)	0.240*** (0.072)	0.253*** (0.066)	0.293*** (0.077)
Institutions (ICRG)	-0.000 (0.002)	-0.002 (0.002)	0.003** (0.001)	-0.000 (0.002)	0.002 (0.001)	-0.001 (0.002)	0.003** (0.001)	-0.001 (0.002)	0.002 (0.001)	-0.002 (0.002)
Laws and attitudes										
Social discrimination against women (SIG)	-0.188* (0.096)	-0.192** (0.089)								
Discriminatory family code Value			-0.108* (0.057)	-0.121* (0.061)					-0.116* (0.067)	-0.098 (0.063)
Son bias Value					-0.131*** (0.039)	-0.076* (0.045)			-0.114*** (0.041)	-0.055 (0.048)
Restricted civil liberties Value							-0.076** (0.037)	-0.062 (0.041)	-0.041 (0.041)	-0.065 (0.044)
Constant	-0.519** (0.209)	-0.219 (0.194)	-0.834*** (0.118)	-0.319* (0.180)	-0.744*** (0.178)	-0.316 (0.190)	-0.881*** (0.111)	-0.385** (0.172)	-0.602*** (0.178)	-0.166 (0.186)
Adjusted R squared	0.382	0.286	0.489	0.286	0.490	0.289	0.486	0.287	0.497	0.292
Standard errors in parentheses										
* p<0.10; ** p<0.05; *** p<0.010										

IV. CONCLUSIONS

21. **Examining the drivers of financial inclusion, this paper identifies both individual characteristics and country-level policies to be associated with financial access.** To gain insights on which policies matter most, we combined the micro-level information of the Findex 2014 survey with structural country characteristics and policies at the national level. In line with other studies, we find that individual demographic characteristics, such as age, gender, educational attainment, and income level are strongly related to an individual's financial inclusion. Controlling for these individual factors, we find that country characteristics and policies also play a role in explaining financial inclusion. The fact that oil exporters tend to exhibit lower levels of financial inclusion is an additional reminder to advance these countries' efforts to diversify their economies. Policies to develop the financial sector, and to improve the environment in which businesses are operating could help private sector activity more generally, and therefore increase the share of the population included into the financial sector. In turn, higher access to financial services would support further private sector activity, economic diversification and growth.

22. **Protection against harassment, including at the workplace, and more equal rights for men and women are strong avenues to enhance women's access to financial services.** Our results show that both attitudes and social norms relating to women as well as legal restrictions are strongly related to women's use of financial services. Introducing laws to protect employees, including women, against harassment is clearly desirable from a development perspective. It will also increase women's productivity and allow them to make more optimal economic choices. In addition, our results suggest that introducing these laws would benefit men's financial inclusion as well. In turn, more equal access to financial services would lead to increased economic welfare, lower income inequality and higher economic diversification, as demonstrated by previous studies.

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Annex I. Correspondence Analysis

Motivation

Categorical variables often do not have comparable scale and distance properties. For example, a question may leave interviewees multiple choices to answer (e.g. degree of access to emergency funds), another may leave only “yes” or “no” as an answer (e.g., whether an individual has borrowed from a financial institution within the past 12 months). The analyst may be interested in knowing if people who answered “Yes” to the second question may be more likely to answer the first question with a particular answer. With a large number of questions, it becomes difficult to simultaneously analyze the data with simple frequencies, while visualization becomes impossible. Correspondence Analysis solves the problem ingeniously giving nominal variables a notion of distance. Correspondence Analysis is an established method in the fields of biometrics, psychometrics, marketing, ecology, and the interdisciplinary fields of the computational sciences.

Simple Correspondence Analysis

This paper utilized Joint Correspondence Analysis, one of many methods in the class of CA. In all approaches, the central concept is to construct a point-cloud using some metric that allows to treat all variables simultaneously and agnostically through Singular Value Decomposition (SVD). In the following, we will provide a simple step-by-step example of Simple Correspondence Analysis to develop the basic concepts used in CA.

Suppose we have two questions in a questionnaire of interest, each with three possible responses – “yes”, “no”, and “missing” (Table A1).

Question	Possible Responses
Please rate access to emergency funds from “very or somewhat possible” (1) to “not very or at all possible” (3).	1, 2, or 3 (else Missing)
Did you borrow from a financial institution within the past 12 months?	Yes or No (else Missing)

A contingency Table then allows to look at the associations between responses (Table A2).

	Q2 (Yes)	Q2 (No)	Q2 (Missing)	Row Totals
Q1 (1)	n_{11}	n_{12}	n_{13}	n_{1+}
Q1 (2)	n_{21}	n_{22}	n_{23}	n_{2+}
Q1 (3)	n_{31}	n_{32}	n_{33}	n_{3+}
Q1 (Missing)	n_{41}	n_{42}	n_{43}	n_{4+}
Column Totals	n_{+1}	n_{+2}	n_{+3}	n_{++}

Note: n_{rc} is the number of respondents who made response r and c . n_{r+} and n_{+c} are the sums of the row and column values, respectively. For all r and c , $n_{rc} = n_{cr}$. The grand total n_{++} is equal to the sums of the row totals, and thus also that of the column totals.

Consider two extreme cases. If the rows and columns are completely independent, the usual chi-squared test of independence (H_0 : no difference between distributions) would not be rejected. On the other hand, rejecting H_0 would suggest the existence of interesting associations. Correspondence analysis pinpoints these associations. The weighted chi-square distances between two individual columns can be found by applying the following formula over the values in Table 2:

$$d_{\chi^2}(c, c') = \sqrt{\sum_{r=1}^R \frac{n_{++}}{n_{r+}} \left(\frac{n_{rc}}{n_{+c}} - \frac{n_{rc'}}{n_{+c'}} \right)^2},$$

where r is the row index and c is the column index. The intuition of this measure can be seen by considering if “Yes” and “No” to Question 2 are “independent”. The distance between the two responses (columns) would be zero if they are identical across all responses to Question 1, and something greater than zero if not. Each response to Question 2 has a chi-square distance to this “average” response (c^*):

$$d_{\chi^2}^2(c, c^*) = \sum_{r=1}^R \frac{n_{++}}{n_{r+}} \left(\frac{n_{rc}}{n_{+c}} - \frac{n_{r+}}{n_{++}} \right)^2.$$

We then modify the distance from the “center of gravity” by weighing it with the column mass to obtain a weighted distance from the center called *inertia*. Responses with greater total volumes hold more leverage for that particular point’s measure of deviation:

$$\text{Inertia} = \sum_{c=1}^J \frac{n_{+c}}{n_{++}} d_{\chi^2}^2(c, c^*),$$

where J is the number of columns. If column variables are completely independent, all of our column points will be identical, and the data cloud would be a single point.

We can now proceed by treating the point-cloud in a similar way as we would in conventional PCA. Analogous to PCA, we are interested in finding a lower dimensional subspace that maximizes total inertia. Of course, the same application of the SVD is used to find the best least squares approximation of a rank $K \leq \min(M - 1, N - 1)$ subspace in CA.

Multiple Correspondence Analysis

Multiple Correspondence Analysis extends the just described simple CA. Here, we first construct a complete disjunctive Table – an $N \times Q$ indicator matrix \mathbf{Z} , where Q is the number of questions and N the number of individuals. This Table would have an expanded set of column variables that take on value 1 for having selected the question response and 0 otherwise. To draw a parallel with the simple case, the matrix \mathbf{Z} can be cross multiplied with itself to form a $Q \times Q$ matrix $\mathbf{B} = \mathbf{Z}^T \mathbf{Z}$ such that each possible response is to be cross tabulated with each other possible response in a pairwise fashion. This matrix is then centered and standardized (using marginal totals) to find \mathbf{S} , on which the algorithm described above is applied.

In the MCA case, clearly one problem is the influence of the meaningless diagonals of \mathbf{B} on the measures of inertia. Joint Correspondence Analysis (JCA) was developed to address this problem, and is an iterative method of finding a best fit using only the off-diagonal values of \mathbf{B} . In our paper, we tried both MCA and JCA, with broadly similar results, but ultimately using JCA for the sake of robustness.

Annex II. Country Sample

Whole Sample: Afghanistan, Albania, Algeria, Angola, Argentina, Armenia, Australia, Azerbaijan, Bahrain, Bangladesh, Belarus, Belgium, Belize, Benin, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Canada, Chad, Chile, China, Columbia, Democratic Republic of Congo, Republic of Congo, Costa Rica, Croatia, Cyprus, Czech Republic, Cote d'Ivoire, Denmark, Dominican Republic, Ecuador, Egypt, Arab Rep., El Salvador, Estonia, Ethiopia, Finland, France, Gabon, Georgia, Germany, Ghana, Greece, Guatemala, Guinea, Haiti, Honduras, Hong Kong SAR, China, Hungary, India, Indonesia, Iraq, Ireland, Israel, Italy, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Korea, Rep., Kosovo, Kuwait, Kyrgyz Republic, Latvia, Lebanon, Lithuania, Luxembourg, Macedonia, FYR, Madagascar, Malawi, Malaysia, Mali, Malta, Mauritania, Mauritius, Mexico, Moldova, Mongolia, Montenegro, Myanmar, Namibia, Nepal, Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Pakistan, Panama, Peru, Philippines, Poland, Portugal, Puerto Rico, Romania, Russian Federation, Rwanda, Saudi Arabia, Senegal, Serbia, Sierra Leone, Singapore, Slovak Republic, Slovenia, Somalia, South Africa, Spain, Sri Lanka, Sudan, Sweden, Switzerland, Taiwan, China, Tajikistan, Tanzania, Thailand, Togo, Tunisia, Turkey, Turkmenistan, Uganda, Ukraine, United Arab Emirates, United Kingdom, United States, Uruguay, Uzbekistan, Venezuela, RB, Vietnam, West Bank and Gaza, Yemen, Rep., Zambia, Zimbabwe.

Emerging and developing economies: Argentina, Armenia, Azerbaijan, Bahrain, Bangladesh, Belarus, Belize, Benin, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Chad, Chile, China, Columbia, Democratic Republic of Congo, Republic of Congo, Costa Rica, Croatia, Dominican Republic, Ecuador, Arab Republic of Egypt, El Salvador, Ethiopia, Gabon, Georgia, Ghana, Guatemala, Guinea, Haiti, Honduras, Hungary, India, Indonesia, Iraq, Jamaica, Jordan, Kazakhstan, Kenya, Kosovo, Kuwait, Kyrgyz Republic, Lebanon, Macedonia, Madagascar, Malawi, Malaysia, Mali, Mauritania, Mauritius, Mexico, Moldova, Mongolia, Montenegro, Myanmar, Namibia, Nepal, Nicaragua, Niger, Nigeria, Pakistan, Panama, Peru, Philippines, Poland, Romania, Russian Federation, Rwanda, Saudi Arabia, Senegal, Serbia, Sierra Leone, South Africa, Sri Lanka, Sudan, Tajikistan, Tanzania, Thailand, Togo, Tunisia, Turkey, Turkmenistan, Uganda, Ukraine, United Arab Emirates, Uruguay, Uzbekistan, Venezuela, Vietnam, Republic of Yemen, Zambia, Zimbabwe.

Sub-Saharan Africa: Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Chad, Democratic Republic of Congo, Republic of Congo, Cote d'Ivoire, Ethiopia, Gabon, Ghana, Guinea, Kenya, Madagascar, Malawi, Mali, Mauritania, Mauritius, Namibia, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, Somalia, South Africa, Sudan, Tanzania, Togo, Uganda, Zambia, Zimbabwe.

Annex III. Variables List

Table A1. Description of the Dataset		
Variable name	Source	Explanation
Financial Inclusion	Staff calculation from WB survey	Individual financial inclusion access scores calculated from WB Survey
Female	WB Survey	Binary, being female equals to 1
Education, at least secondary	WB Survey	Binary as having completed secondary or higher education equals to 1
Age	WB Survey	
Top 20 percent income	WB Survey and staff calculations	Binary, being in the top 20% income quintile equals to 1
Wage employed	WB Survey	Binary, having received wage payment in the last 12 months equals to 1
Population density	World Bank	Land area divided by adult population defined as WB Survey
Log of real GDP per capita	Penn World Table 8.0	Log of output-side real GDP at chained PPPs (in mil. 2011US\$) divided by population
Financial Development	Financial Development Index	IMF, Sahay 2015
Fuel Exporters		
Fertility rate	World Bank	Fertility rate, total (births per woman)
Women's mean age at marriage	United Nations	UNPD World Fertility and Marriage Database
Mean years of schooling	Barro & Lee, 2013	Mean years of schooling
ICRG risk rating (composite index and political risk index)	International Country Risk Guide	Composite of Political, Financial, Economic Risk Rating for a country (CPFER) = 0.5 ((Political Risk + Financial Risk + Economic Risk). Ranging from Very High Risk (00.0 - 49.5) to Very Low Risk (80.0 - 100). The higher the points, the lower the risk.
Legislation against domestic violence (average; and civil remedies for sexual harassment)	Women Business and the Law	Binary as 1 if there is a legislation against domestic violence
Legal rights index	Women Business and the law	0 to 1, with 1 denoting full range of rights
Social discrimination against women (SIGI)	Social Institutions and Gender Index	0 to 1, with 1 indicating high inequality
Corruption Perception Index	Transparency International	0 (highly corrupt) to 100 (very clean)

Annex IV. Summary Statistics

Table A.2. Summary Statistics

Variable	Description	N	Mean	StDev	Min	Median	Max
Proper2014a	Financial Inclusion Index	141188	0.421	0.318	0	0.449	1
female	Female	141188	0.532	0.499	0	1	1
educ_s	Secondary Education	141188	0.668	0.471	0	1	1
age	Age	140878	41.774	17.713	15	40	99
age2	Age suaqred	140878	2058.816	1655.25	225	1600	9801
q34	Public employment	140206	0.339	0.474	0	0	1
inc_top_20	Top 20% income	141172	0.247	0.431	0	0	1
pop_dens	Population density	141188	1.975	7.458	0.013	0.612	64.102
lgdppcPPP	Real GDP p.c.	140168	9.24	1.145	6.569	9.35	11.419
Fuel_Exporters	Fuel Exporters	141188	0.149	0.356	0	0	1
meanyrsch	Mean years of schooling	131575	8.286	3.019	1.3	8.6	12.9
findepth13	Financial development	135180	0.399	0.237	0.064	0.322	0.945
ICRG_crr	ICRG	121612	69.483	8.282	47.75	68.75	90
dm_avg	Domestic violence legislation	139188	0.578	0.237	0.034	0.667	0.893
C_avg	Other laws on female empowerment	92068	0.83	0.164	0.333	0.867	1.133
borrow	Borrowed from financial institution	141188	0.427	0.495	0	0	1
account	Account at financial institution	141188	0.58	0.493	0	1	1
fertility_rate	Fertility rate	131575	2.699	1.481	1.2	2.115	7.656
smam_f	Female age of marriage, average	131575	23.632	6.293	0	24.4	33.2
sigi_2014	Social discrimination against women	89411	0.18	0.139	0.002	0.147	0.563
sigi1	Discriminatory family code	128571	0.309	0.257	0	0.262	1
sigi3	Son bias	106445	0.229	0.224	0	0.143	1
sigi5	Restricted civil liberties	129574	0.384	0.234	0	0.354	1
C1822000	Non-discrimination clause covering gender	92068	0.556	0.497	0	1	1

Table A5. Probit Estimations: Determinants of Women's Probability of Having an Account at a Financial Institution

	(1)	(2)	(3)	(4)	(5)	(6)
<u>Individual characteristics</u>						
Secondary education	0.838*** (0.076)	0.451*** (0.055)	0.483*** (0.038)	0.518*** (0.035)	0.499*** (0.038)	0.521*** (0.033)
Age	0.031*** (0.005)	0.030*** (0.004)	0.029*** (0.004)	0.029*** (0.004)	0.033*** (0.004)	0.033*** (0.003)
Age squared	-0.000** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)
Wage employment	1.008*** (0.051)	0.837*** (0.047)	0.818*** (0.054)	0.821*** (0.052)	0.813*** (0.051)	0.827*** (0.047)
Top 20 percent income	0.163*** (0.028)	0.342*** (0.026)	0.345*** (0.027)	0.342*** (0.028)	0.351*** (0.026)	0.341*** (0.027)
<u>Country characteristics</u>						
Population density		0.015* (0.008)	0.008 (0.005)	0.006 (0.005)	-0.002 (0.004)	0.005 (0.006)
GDP p.c.		0.566*** (0.047)	0.270** (0.130)	0.317** (0.128)	0.525*** (0.184)	0.514*** (0.141)
Fuel Exporter		-0.666*** (0.119)	-0.342*** (0.118)	-0.265** (0.120)	-0.231* (0.131)	-0.199 (0.124)
<u>Policies</u>						
Mean years of schooling			0.042 (0.036)	0.024 (0.035)	0.019 (0.034)	0.05 (0.038)
Financial development			1.218*** (0.266)	1.144*** (0.244)	1.155*** (0.282)	0.703** (0.347)
Institutions (ICRG)			0.012 (0.009)	0.008 (0.009)	0.004 (0.009)	-0.005 (0.009)
<u>Laws</u>						
Civil remedies for sexual harassment				0.337*** (0.114)	0.362*** (0.106)	0.348*** (0.097)
Constant	-1.715*** (0.10)	-6.286*** (0.43)	-5.183*** (0.86)	-5.377*** (0.81)	-6.311*** (1.20)	-6.246*** (0.90)
Income dummies	No	No	No	No	Yes	No
Regional dummies	No	No	No	No	No	Yes

Standard errors in parentheses

* p<0.10; ** p<0.05; *** p<0.010