Financial Inclusion in Papua New Guinea

Martin Davies[1] & Laura Nettuno[2]

[1]Washington & Lee University

[2]Vanderbilt University

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Research Question

- What individual level characteristics determine financial inclusion in Papua New Guinea?
  - Gender
  - Education
  - Distance to bank
  - English
- What is the influence of gender on financial inclusion in Papua New Guinea?
  - Spillover benefits from husbands to wives, but not from wives to husbands.
- Approach
  - Theoretical model
  - Empirical estimation of descriptive results
  - Novel dataset consisting of both the male and female heads of household, which allows us to examine intra-household bargaining.

Overview

1. Financial Inclusion: What is it?
2. Relevant literature
3. Theoretical model and conclusions
4. Data
5. Empirical specification
6. Results
7. Policy discussion
8. Conclusion

Financial Inclusion: What is it?

Supply-side definitions

- "Access to appropriate financial services so that people can manage their money effectively, securely and confidently on a day-to-day basis; plan for the future and cope with financial distress to protect against short term variations in income and expenditure and take advantage of longer term opportunities and deal effectively with financial distress." (HM Treasury)
- "Individuals and businesses have access to useful and affordable financial products and services that meet their needs – transactions, payments, savings, credit and insurance – delivered in a responsible and sustainable way." (World Bank)

Our paper focuses on observed financial inclusion (demand and supply) as measured by bank account ownership

Financial Inclusion: Why is it so important?

- Allows households to smooth consumption
- Investment in education and health
  - Drivers of long term economic growth and development
  - Higher growth and lower inequality
- Exploit business opportunities (SMEs)
  - Leads to job creation
- Financial services act as a bridge between economic opportunity and outcome
- **Policy relevance:** understand of the restrictions/bottlenecks that prevent access to financial services by poorer households. Helps to build policy changes that will enable and empower households to use financial services.

Financial Inclusion in PNG

- 2021: $\sim$40% of adults in low- and middle-income Asia-Pacific economies do not have a bank account, and less than 10 percent have borrowed from formal financial institutions.
- Papua New Guinea has the lowest financial inclusion index of all Asia-Pacific countries, according to the IMF. (2018)

Relevant Applied Literature

From the development literature:

- Women tend to make more future-oriented choices than men, especially when there are children in the household. This is evidenced by differential spending on things like children's education expenses and healthcare.
  - Duflo, 2012
- Women and people with higher education tend to have lower discount rates.
  - Bauer and Chytilova, 2010 2014
- Road quality and remoteness contribute to poverty in PNG. Not only due to differences in human capital – infrastructure directly influences access to other resources.
  - Gibson and Rozelle, 2003

Relevant Theoretical Literature

- Becker (1965), Gronau (1977): theory of the household
- Becker and Mulligan (1997) $\rightarrow$ develop a model of an individual's endogenously determined discount rate. Their analysis shows how wealth, mortality, addictions, uncertainty, and other variables affect the degree of time preference.

Diagram 2

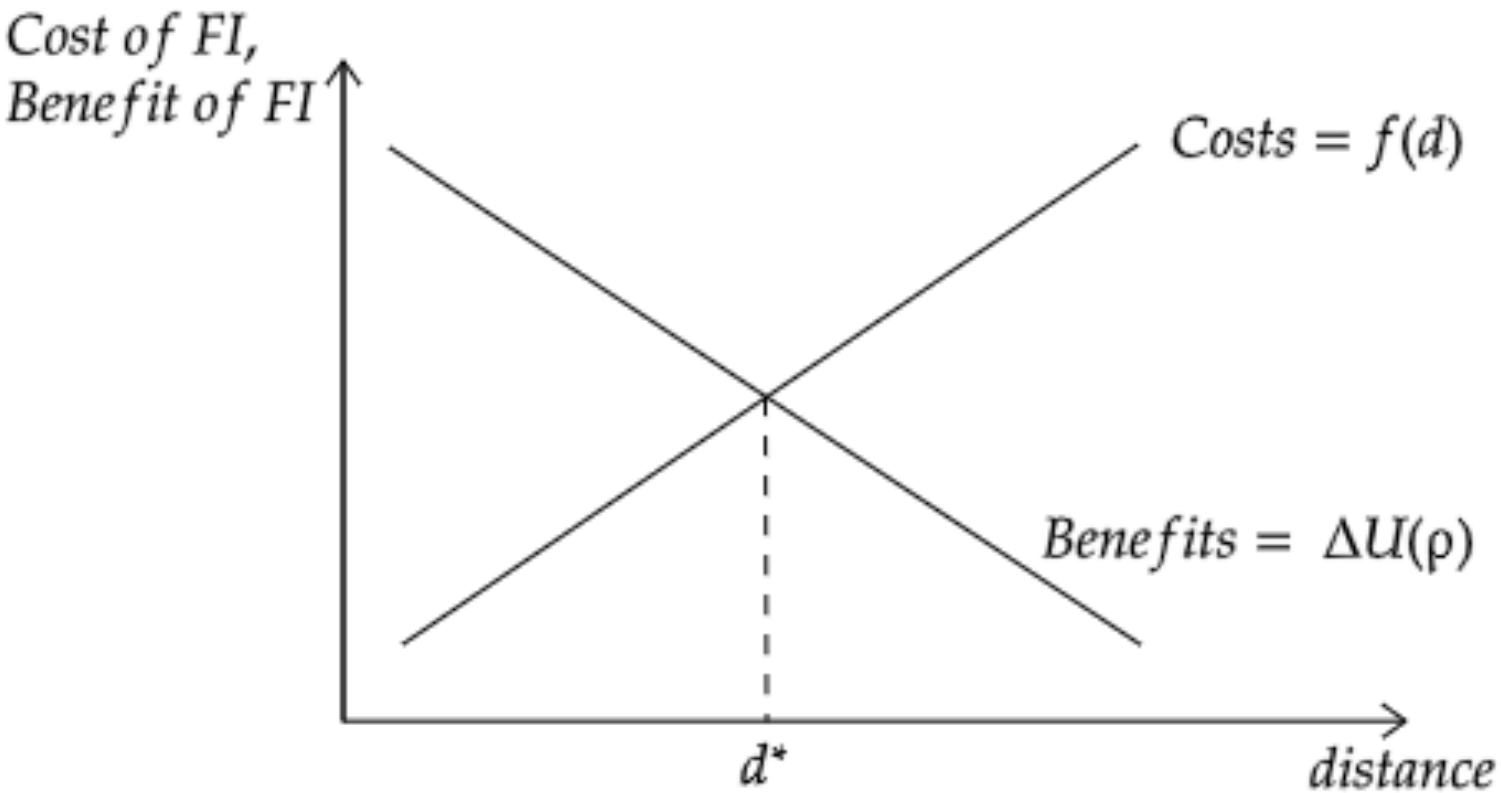
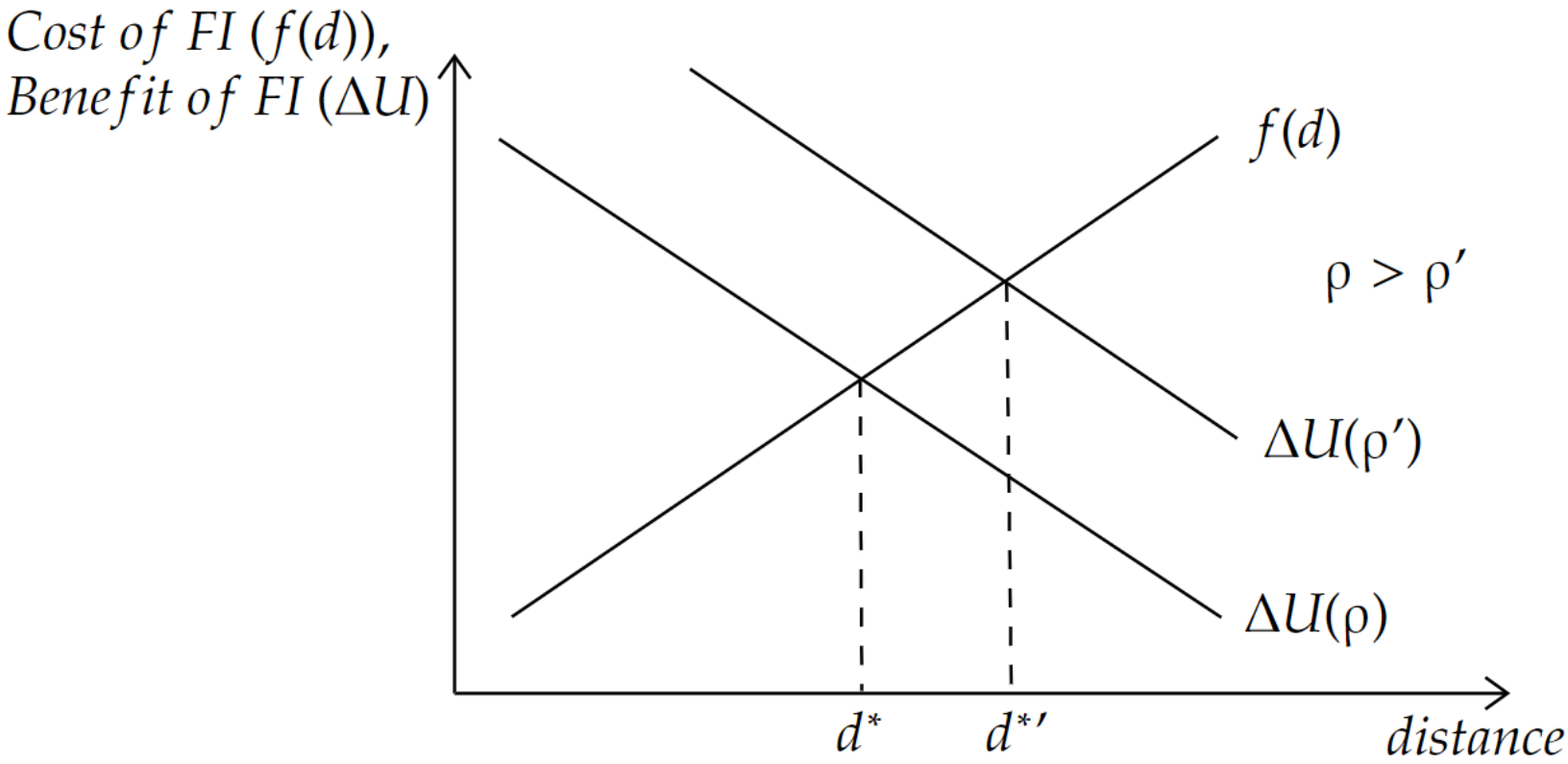


Diagram 3



Predictions of the Model

- Characteristics of individual matter
  - $\uparrow$ education $\Rightarrow \downarrow \rho$ (more patient)
  - females are more patient: $\rho_{female} < \rho_{male}$
- More patient households (lower ρ) $\Rightarrow$ more likely to FI
  - Education
  - Female HoH
- Intra-HH bargain: HHs in which females have more bargaining power $\Rightarrow \downarrow \rho$
  - HHs where female is more educated than male
  - Female HoH
- Distance matters
  - distance increases the cost, and decreases the benefits of, FI
  - more distant HHS less likely to FI

Data

- 2014 World Bank-INA survey targeting financial inclusion, financial competency, and poverty
- $\sim$600 individual observations (2 respondents per household)
- Respondents from each household were surveyed separately by same-sex interviewers to ensure more truthful answers.
- Representative of Morobe and Madang provinces
- Stratification of districts by female literacy and predicted poverty to get a representative sample
- Weaknesses:
  - Lack of funding; sample size smaller than intended.
  - Lack of responses for financial information.

Descriptive Statistics

	RURAL		URBAN	
Variable	**Obs**	**Mean**	**Obs**	**Mean**
Age	519	38.35 (19 - 83)	83	38.33 (18 - 65)
Sex	531	50%	84	48%
Primary	531	46%	84	35%
Secondary	531	10%	84	30%
Tertiary	531	10%	84	31%
English	526	34%	84	80%
Monthly Income	513	446.02 (5 - 10,000)	84	1114.52 (30 - 7,000)
Number of HH Members	531	6.11 (0 - 20)	84	6.55 (2 - 13)
Distance to Bank	460	66.20 (0.5 - 350)	77	2.89 (0.5 - 6)

Descriptive Statistics

	Bank Account	
	Urban (84)	**Rural (531)**
Male	36.9%	14.7%
Female	16.7%	6.6%
Total	53.6%	21.3%
Primary	16.7%	7.0%
Secondary	14.3%	4.9%
Tertiary	22.6%	6.8%
English	48.8%	15.1%

Descriptive Statistics

	Obs.	Bank Account
0-20 km	316	122
20-40 km	58	22
40-60 km	17	4
60-100 km	48	3
100-200 km	33	0
No Access	143	7

Empirical Specification

$$\begin{aligned} Inclusion_i = \beta_0 &+ \beta_1 Age_i + \beta_2 Sex_i \\ &+ \beta_3 Education_i + \beta_4 Income_i + \beta_5 HHMembers_i \\ &+ \beta_6 Distance_i + \beta_7 Urban_i + \beta_8 English_i \end{aligned}$$

where:

- $Inclusion_i$ is a binary variable for being financially included
- Age_i is measured in years
- $Education_i$ is a series of indicator variables for different the highest level of education achieved
- $Income_i$ is monthly income in Kina
- $HHMembers_i$ is the number of people living in the household
- $Distance_i$ represents the distance the respondent's house to the closest bank
- Sex_i, $Urban_i$, and $English_i$ are all indicator variables

Full Sample

	(1) BankAcct	(2) BankAcct	(3) BankAcct	(4) BankAcct
age	0.00206	0.00179	0.00146	0.00122
	(0.00158)	(0.00159)	(0.00156)	(0.00157)
sex	0.139***	0.127***	0.129***	0.118***
	(0.0321)	(0.0310)	(0.0316)	(0.0305)
primary	0.0875***	0.0762**	0.0406	0.0353
	(0.0314)	(0.0309)	(0.0335)	(0.0334)
secondary	0.334***	0.296***	0.208***	0.189**
	(0.0663)	(0.0648)	(0.0799)	(0.0789)
tertiary	0.506***	0.447***	0.386***	0.346***
	(0.0646)	(0.0652)	(0.0752)	(0.0752)
monthlyinc	0.0000704***	0.0000677***	0.0000638***	0.0000623***
	(0.0000213)	(0.0000183)	(0.0000206)	(0.0000180)
hhmembers	0.0118*	0.0122*	0.0122*	0.0125*
	(0.00655)	(0.00670)	(0.00656)	(0.00671)
urban	0.100*	0.0582	0.0833	0.0452
	(0.0555)	(0.0559)	(0.0559)	(0.0563)
DistDummy		-0.0533***		-0.0519***
		(0.00803)		(0.00801)
english			0.153***	0.130***
			(0.0467)	(0.0456)
_cons	-0.159**	-0.0487	-0.139*	-0.0313
	(0.0720)	(0.0743)	(0.0722)	(0.0745)
N	584	584	579	579

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

- Men are 12% more likely to be financially included
- Likelihood of having a bank account increases monotonically with education
- Living farther away from a bank decreases the likelihood that a person has an account
- English-speaking is very important! English is taught in primary school.
- Effect of income:
  - If monthly income increases by \$100 $\Rightarrow$ likelihood of being financially included increases by 2.5%

Results Separately by Gender

Female Sample

	(1) BankAcct	(2) BankAcct	(3) BankAcct	(4) BankAcct
age	0.000663	0.000585	0.000581	0.000499
	(0.00156)	(0.00155)	(0.00157)	(0.00156)
primary	0.0841**	0.0563*	0.0607*	0.0384
	(0.0336)	(0.0317)	(0.0362)	(0.0347)
secondary	0.276***	0.240***	0.206*	0.188*
	(0.0954)	(0.0895)	(0.108)	(0.103)
tertiary	0.713***	0.649***	0.648***	0.601***
	(0.0847)	(0.0865)	(0.101)	(0.101)
monthlyinc	0.0000354*	0.0000381**	0.0000331	0.0000365**
	(0.0000207)	(0.0000183)	(0.0000203)	(0.0000181)
hhmembers	0.00119	0.00288	0.000891	0.00253
	(0.00677)	(0.00683)	(0.00671)	(0.00678)
urban	-0.0413	-0.0673	-0.0399	-0.0659
	(0.0724)	(0.0720)	(0.0727)	(0.0722)
DistDummy		-0.0407***		-0.0401***
		(0.00787)		(0.00791)
english			0.0721	0.0531
			(0.0608)	(0.0585)
_cons	-0.0161	0.0624	-0.0106	0.0678
	(0.0754)	(0.0761)	(0.0761)	(0.0770)
N	298	298	297	297

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Male Sample

	(1) BankAcct	(2) BankAcct	(3) BankAcct	(4) BankAcct
age	0.00353	0.00316	0.00252	0.00218
	(0.00241)	(0.00236)	(0.00236)	(0.00231)
primary	0.0953*	0.123**	0.0439	0.0762
	(0.0565)	(0.0554)	(0.0574)	(0.0570)
secondary	0.355***	0.338***	0.224**	0.224**
	(0.0864)	(0.0859)	(0.103)	(0.103)
tertiary	0.341***	0.315***	0.220**	0.211**
	(0.0874)	(0.0855)	(0.102)	(0.0995)
monthlyinc	0.000150***	0.000131***	0.000138***	0.000121***
	(0.0000275)	(0.0000270)	(0.0000279)	(0.0000275)
hhmembers	0.0196**	0.0183**	0.0210**	0.0195**
	(0.00949)	(0.00925)	(0.00951)	(0.00925)
urban	0.227***	0.174**	0.187**	0.141*
	(0.0854)	(0.0844)	(0.0860)	(0.0851)
DistDummy		-0.0611***		-0.0602***
		(0.0129)		(0.0128)
english			0.177**	0.154**
			(0.0718)	(0.0704)
_cons	-0.165	-0.0586	-0.148	-0.0425
	(0.108)	(0.111)	(0.108)	(0.111)
N	286	286	282	282

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Interpretation

- For women, financial inclusion is increasing in education.
- For men, the effect levels out after secondary education.
- Tertiary education effects for women are 2-3 times larger than the analogous effects for men

Spillovers of Spouse's Education

Female Sample

	(1) BankAcct	(2) BankAcct	(3) BankAcct	(4) BankAcct
age	0.000695	0.000617	0.000612	0.000530
	(0.00155)	(0.00155)	(0.00157)	(0.00156)
primary	0.0967***	0.0689**	0.0747**	0.0526
	(0.0343)	(0.0321)	(0.0379)	(0.0361)
secondary	0.304***	0.268***	0.240**	0.222**
	(0.0951)	(0.0890)	(0.111)	(0.105)
tertiary	0.738***	0.674***	0.678***	0.631***
	(0.0812)	(0.0827)	(0.101)	(0.101)
SpouseGreater	0.0681**	0.0681**	0.0653*	0.0667**
	(0.0336)	(0.0329)	(0.0346)	(0.0339)
monthlyinc	0.0000344*	0.0000371**	0.0000324	0.0000358**
	(0.0000202)	(0.0000177)	(0.0000198)	(0.0000175)
hhmembers	0.00125	0.00293	0.000949	0.00260
	(0.00682)	(0.00685)	(0.00675)	(0.00680)
urban	-0.0504	-0.0765	-0.0487	-0.0751
	(0.0711)	(0.0707)	(0.0716)	(0.0710)
DistDummy		-0.0407***		-0.0403***
		(0.00785)		(0.00790)
english			0.0654	0.0461
			(0.0626)	(0.0602)
_cons	-0.0614	0.0170	-0.0539	0.0239
	(0.0773)	(0.0768)	(0.0784)	(0.0779)
N	298	298	297	297

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Male Sample

	(1) BankAcct	(2) BankAcct	(3) BankAcct	(4) BankAcct
age	0.00379	0.00338	0.00276	0.00237
	(0.00240)	(0.00236)	(0.00235)	(0.00231)
primary	0.108*	0.132**	0.0573	0.0860
	(0.0554)	(0.0547)	(0.0568)	(0.0568)
secondary	0.369***	0.350***	0.243**	0.239**
	(0.0853)	(0.0852)	(0.102)	(0.103)
tertiary	0.372***	0.341***	0.253**	0.237**
	(0.0863)	(0.0843)	(0.101)	(0.0986)
SpouseGreater	0.113*	0.0920	0.0905	0.0716
	(0.0602)	(0.0605)	(0.0594)	(0.0599)
monthlyinc	0.000146***	0.000128***	0.000136***	0.000119***
	(0.0000276)	(0.0000270)	(0.0000280)	(0.0000275)
hhmembers	0.0167*	0.0160*	0.0184*	0.0175*
	(0.00947)	(0.00927)	(0.00949)	(0.00927)
urban	0.226**	0.175**	0.189**	0.143*
	(0.0872)	(0.0861)	(0.0876)	(0.0866)
DistDummy		-0.0587***		-0.0586***
		(0.0130)		(0.0129)
english			0.165**	0.145**
			(0.0714)	(0.0702)
_cons	-0.195*	-0.0874	-0.170	-0.0630
	(0.106)	(0.109)	(0.106)	(0.110)
N	286	286	282	282

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Interpretation

- Women who have more educated husbands are 7% more likely to be financially included
- The analogous result is not true for men.
- Women are listening to their husbands... but it looks like men aren't listening to their wives.

Heads of Households

HoH Sample

	(1) HH_has_acct	(2) HH_has_acct	(3) HH_has_acct	(4) HH_has_acct
age	0.00417*	0.00388	0.00315	0.00289
	(0.00247)	(0.00246)	(0.00240)	(0.00238)
HOHgender	-0.199**	-0.255***	-0.236**	-0.290***
	(0.0936)	(0.0893)	(0.0965)	(0.0917)
primary	0.102*	0.123**	0.0445	0.0672
	(0.0589)	(0.0580)	(0.0583)	(0.0581)
secondary	0.396***	0.376***	0.234**	0.225**
	(0.0889)	(0.0875)	(0.105)	(0.104)
tertiary	0.397***	0.354***	0.252**	0.218**
	(0.0836)	(0.0818)	(0.0978)	(0.0961)
monthlyinc	0.000130***	0.000120***	0.000111***	0.000102***
	(0.0000289)	(0.0000255)	(0.0000301)	(0.0000267)
hhmembers	0.0149	0.0146	0.0163	0.0159
	(0.0106)	(0.0105)	(0.0103)	(0.0103)
urban	0.245***	0.188**	0.202**	0.149*
	(0.0836)	(0.0836)	(0.0843)	(0.0843)
DistDummy		-0.0590***		-0.0586***
		(0.0135)		(0.0134)
english			0.216***	0.202***
			(0.0730)	(0.0716)
_cons	0.0435	0.196	0.0936	0.245*
	(0.141)	(0.138)	(0.141)	(0.138)
N	287	287	283	283

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

- PNG has both matrilineal and patrilineal societies.
- Our 2-obs per HH dataset allows us to analyze the effect of the HoH's gender on financial inclusion of the household.
- Households headed by a male are btwn 20% and 30% less likely to be financially included

Policy Relevance and Conclusions

- Gender and bargaining power within the household matters
- Education is important
  - Policy Implication: free primary education is good
  - Primary education is teaching students (enough) English to facilitate financial inclusion
- Distance is important
  - Better roads
  - Encourage financial institutions to locate in more remote locations
  - Mobile banking as an option