How vulnerable are the self-employed? Evidence from Uganda

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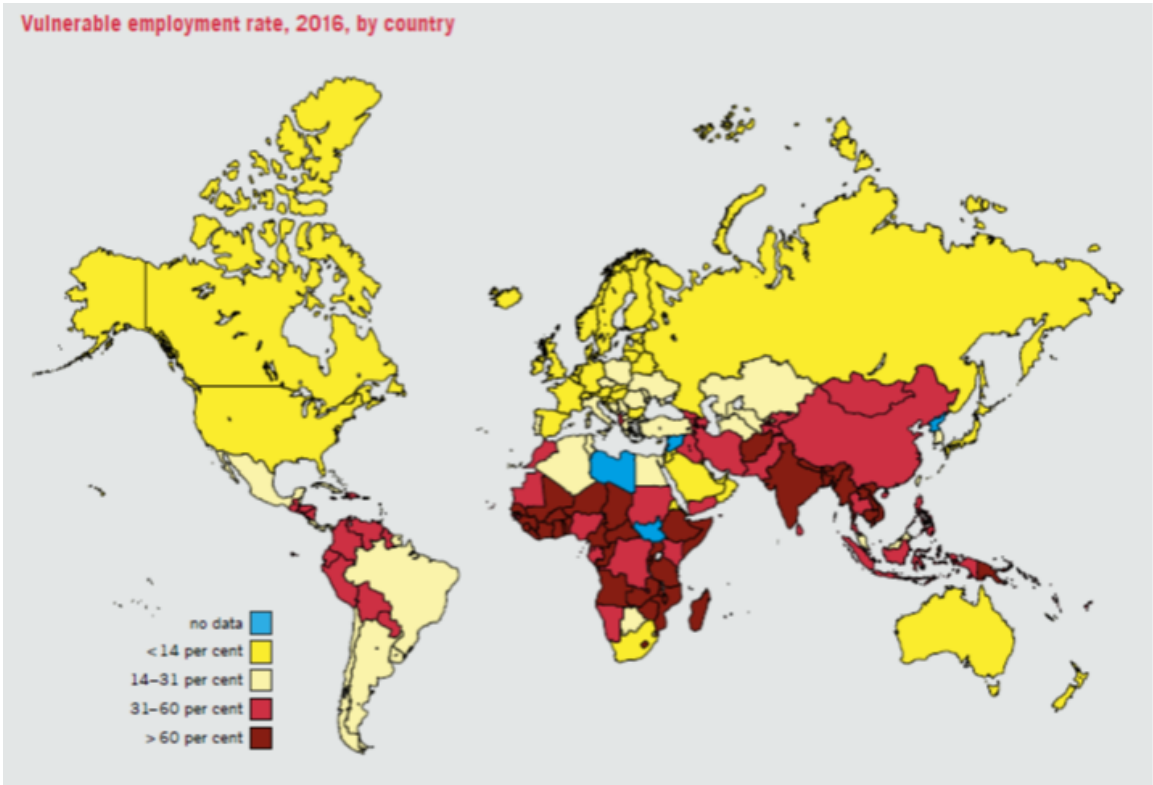
Vulnerable employment around the world

ILO: own-account workers and contributing family workers are in vulnerable employment.



Note: The chart displays the share of the employed population classified as being in vulnerable employment, based on a quartile distribution.

Source: ILO calculations based on ILO Research Department's Trends Econometric Models, *November 2015.*

Why study the vulnerability of the self-employed?

... because the relationship between self-employment and vulnerability is much more complex than the ILO's blanket approach suggests.

- Self-employment may mean inadequate earnings in the long run if born out of necessity
- Self-employment means poor people bear entrepreneurial risks, close inter-linkages between business and household finances may create poverty risk and hamper business success
- Misclassification likely for highly successful and/or wealthy entrepreneurs
- Status in employment (employer/own-account worker/employee) is somewhat fluid, resulting classifications arbitrary

$\Rightarrow$ Policy should be informed by an improved understanding of underlying mechanisms

This paper

- Critically examines the ILO definition of vulnerable employment
- Builds on the concept of vulnerability as expected poverty to arrive at a concept of vulnerability in self-employment
- Provides an empirical application using panel data from small-scale entrepreneurs in Uganda

Research gap

Connecting three strands of literature

- **Decent work and living wages**: concepts (ILO, Anker & Anker)
- **Poverty and vulnerability to poverty**: concepts and methods (Hoddinot & Quisumbing, 2003; Ward, 2016)
  - Chronic vs. transient poverty: spells, components, vulnerability
  - Vulnerability as expected poverty
- **Small-scale entrepreneurship and risk**: context (Grimm et al., 2012; 2015)
  - necessity entrepreneurship, survivalism
  - income variability and underinvestment

Research questions

1. How can we understand vulnerability in self-employment?
2. How vulnerable are the self-employed?
3. What is the time dimension of vulnerability?
4. What are the characteristics associated with being vulnerable?

Towards a concept of vulnerability in self-employment

"**Vulnerable employment** is often characterized by **inadequate earnings**, **low productivity** and difficult conditions of work that undermine workers' fundamental rights." (ILO, emphasis added)

Vulnerability can be defined as "the **likelihood** that at a given time in the future, an individual will have a **level of welfare** below **some norm or benchmark**" (Hoddinot and Quisumbing, 2003, emphasis added).

$$V_{it} = Pr(y_{i,t+1} < z), \tag{1}$$

To do: (1) find threshold z, (2) define and estimate income y, (3) calculate probability and classify entrepreneurs accordingly.

(In-)adequate earnings: living wages

- **Adequate living wage** part of ILO's founding principles: understood as "a wage adequate to maintain a reasonable standard of life as this is understood in their time and country" (Article 427, ILO Constitution)
- Estimate by WageIndicator Foundation based on Anker and Anker (2017): housing as separate category, normative foundations for spending categories, cost of living survey.

WageIndicator living wage estimates, October 2017

	Standard family		Single adult		Typical family	
	from	**to**	**from**	**to**	**from**	**to**
Food	445	583	111	146	880	1,152
Housing	250	300	194	263	250	300
Transport	170	300	85	150	170	300
Health	40	100	10	25	40	100
Education	100	140	0	0	100	140
Other costs	50	71	20	29	72	100
Total Expenditure	1,056	1,494	420	613	1,512	2,091
Net Living Wage	587	830	420	613	796	1,101
Gross Living Wage	**751**	1,063	538	785	1,018	1,409
In 2012 USD	**230**	325	164	240	311	431

Note: All values in 1,000 UGX. Source: WageIndicator 2018 - WageIndicator.org - Uganda - Living Wage Series, October 2017.

Profits as income and the living wage threshold

Assumptions

1. average family composition as basis for z
2. entrepreneur's income = business profits

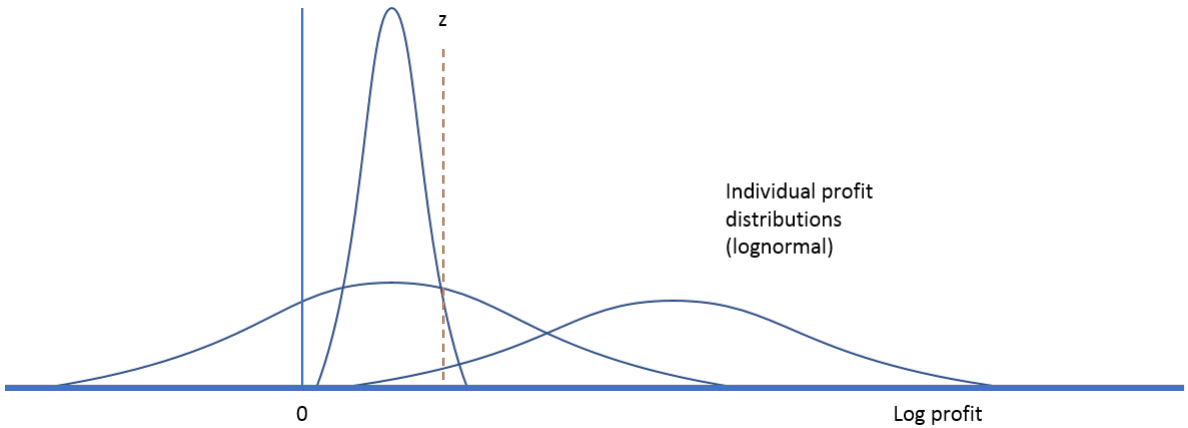
Given assumptions 1 and 2, we can determine whether an entrepreneur's earnings are inadequate, $\Pi < z$.
In order to calculate the probability that $\hat{\Pi} < z$, model profits

$$\Pi_{it} = \Pi(K_{it}, L_{it}, X_{it}, \alpha_i, \delta_t, \varepsilon_{it}) \tag{2}$$

as a function of capital and labour inputs, time-varying and time-invariant entrepreneur and enterprise characteristics, time effects, and idiosyncratic time-variant effects.

Vulnerability as a probability

Assumption 3: for each entrepreneur, profits are log-normally distributed *through time*.



We can then obtain individual vulnerability estimates that $\hat{\Pi} < z$ as

$$V_{it} = \Phi\left(\frac{lnz - E[ln\Pi_{it}|X'_{it}, \hat{\beta}, \hat{\alpha}_i, \hat{\delta}_t]}{\sqrt{Var[ln\Pi_{it}|X'_{it}, \hat{\beta}, \hat{\alpha}_i, \hat{\delta}_t]}}\right) \quad (3)$$

Data

- **Panel dataset** of 430-500 MSEs in Kampala, Uganda, yearly 2012-2017.
- Two-stage random sampling, diverse sector background, but not fully representative.
- Balanced panel 240 observations with full information

Descriptive statistics

Variable	Obs	Mean	Std. Dev.	P50
Profit (2012 USD)	246	344	808	176
Capital stock (2012 USD)	246	2338	8886	314
Total labour (hours/month)	246	654	574	500
Entrepreneur's labour (hours/month)	246	305	84	302
Own-account worker (%)	246	43	50	0
Firm age (years)	244	8	7	6
Registered with Uganda Revenue Authority (%)	246	7	25	0
Credit constrained (formal and informal)	245	48	50	0
Edu: primary (%)	246	43	50	0
Edu: O-level (%)	246	27	44	0
Edu: A-level (%)	246	17	38	0
Edu: University (%)	246	9	29	0
Age (years)	243	35	10	34
Female entrepreneur (%)	246	42	50	0
Married (%)	245	57	50	100
Size of respondent's household	246	5	2	5
Respondent is household head/spouse (%)	246	96	19	100

Descriptive statistics

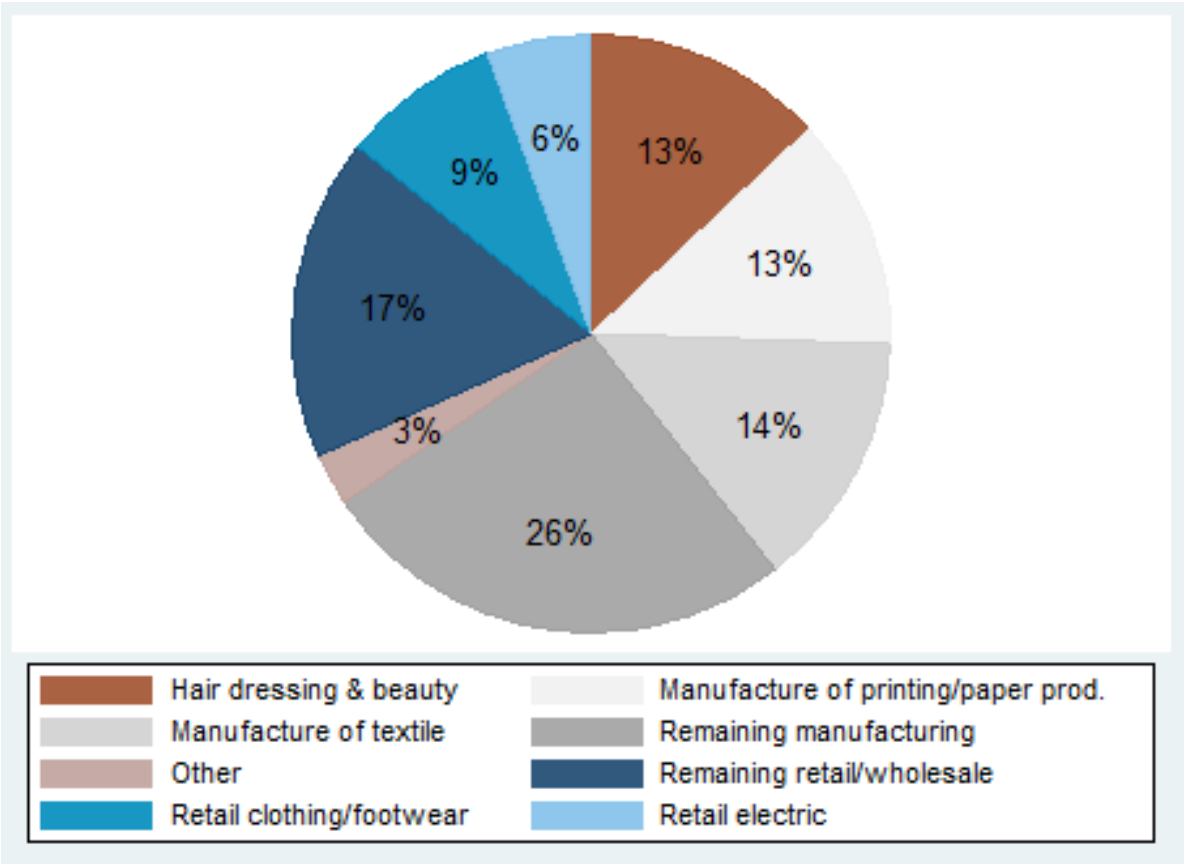


Figure: Industry sectors at baseline, N=246.

Results

- **Inadequate earnings**: profits below living wage
- **Estimating profits** as a function of entrepreneur and enterprise characteristics
- **Classifying entrepreneurs** into vulnerable and non-vulnerable according to the probability of having profits below living wage

Inadequate earnings

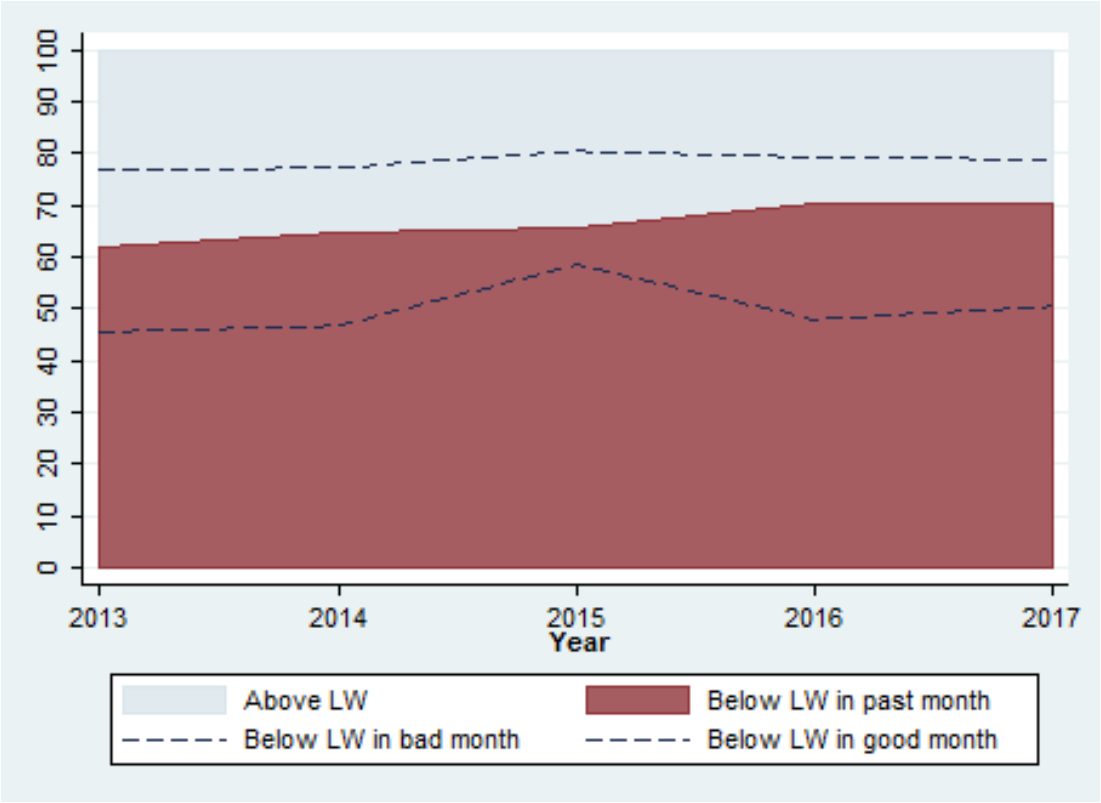


Figure: Percentage of entrepreneurs with profits below family living wage by year. Balanced panel sample (N=243). Source: author's calculations.

Relaxing the "standard family" assumption: ▸ robustness check

Inadequate earnings - transitions

	Profits in t+1					
	Above LW		Below LW		Total	
Profits in t	No	(%)	No	(%)	No	(%)
Above living wage	274	57.7	201	42.3	475	100.0
Below living wage	170	19.9	685	80.1	855	100.0
Total	444	33.4	886	66.6	1,330	100.0

Table: Transition matrix. Pooled sample 2013-2017.

Determinants of profits:firm

Dep: log profit	RE	RE	FE
Capital stock (2012 USD)	0.104***	0.100***	0.098**
	(0.022)	(0.022)	(0.035)
Log labour hours	0.244***	0.234***	0.163**
	(0.047)	(0.046)	(0.054)
Firm age	0.023	0.023	0.008
	(0.015)	(0.015)	(0.034)
Firm age squared	-0.000	-0.000	0.000
	(0.001)	(0.001)	(0.002)
Registered with URA	0.339***	0.345***	0.316***
	(0.075)	(0.076)	(0.088)
Credit constrained	-0.119*	-0.115*	-0.070
	(0.054)	(0.055)	(0.062)
Industry sector: hair dressing and beauty	-0.478***	-0.477***	
	(0.107)	(0.106)	
Industry sector: retail	-0.023	-0.021	
	(0.085)	(0.084)	
Industry sector: other	-0.289	-0.270	
	(0.163)	(0.158)	
Central division	0.326***	0.322***	
	(0.079)	(0.080)	

Determinants of profits:entrepreneur

Dep: log profit	RE	RE	FE
Age in years	0.038	0.040	0.119
	(0.023)	(0.023)	(0.109)
Age squared	-0.001*	-0.001*	-0.002
	(0.000)	(0.000)	(0.001)
HH wealth, t-1	1.493***	1.611***	0.768*
	(0.213)	(0.219)	(0.345)
Female	-0.426***	-0.404***	
	(0.078)	(0.077)	
Edu: completed O-level	0.051	0.036	
	(0.082)	(0.082)	
Edu: completed A-level	0.022	-0.009	
	(0.113)	(0.114)	
Edu: completed university	0.030	0.012	
	(0.129)	(0.131)	
Cognitive ability	0.080*	0.078*	
	(0.032)	(0.032)	

Determinants of profits:shocks

Dep: log profit	RE	RE	FE
Health shock		-0.074	-0.036
		(0.066)	(0.076)
Bus. temporarily closed		-0.075	0.092
		(0.108)	(0.107)
Divorced or widowed		-0.214	-0.257
		(0.132)	(0.155)
Household lost wage earner		0.001	-0.010
		(0.065)	(0.076)
Household asset shock		-0.170	-0.046
		(0.088)	(0.097)
R-squared(overall)	0.458	0.464	0.231
R-squared(within)	0.085	0.083	0.086
R-squared(between)	0.674	0.683	0.310
N	1081	1076	1076
N(clusters)	243	243	
Joint significance of shocks			
$\chi^2(5)$		5.14	
$F(5, 476)$			.51
Prob >F /> χ^2		.40	.77

Notes: clustered standard errors in parentheses. * p<0.05, ** p<0.01, *** p<0.001.
Time dummies included, observations with non-positive profits excluded.

Including non-pos. profits: ▸ robustness check

Vulnerability groups over time

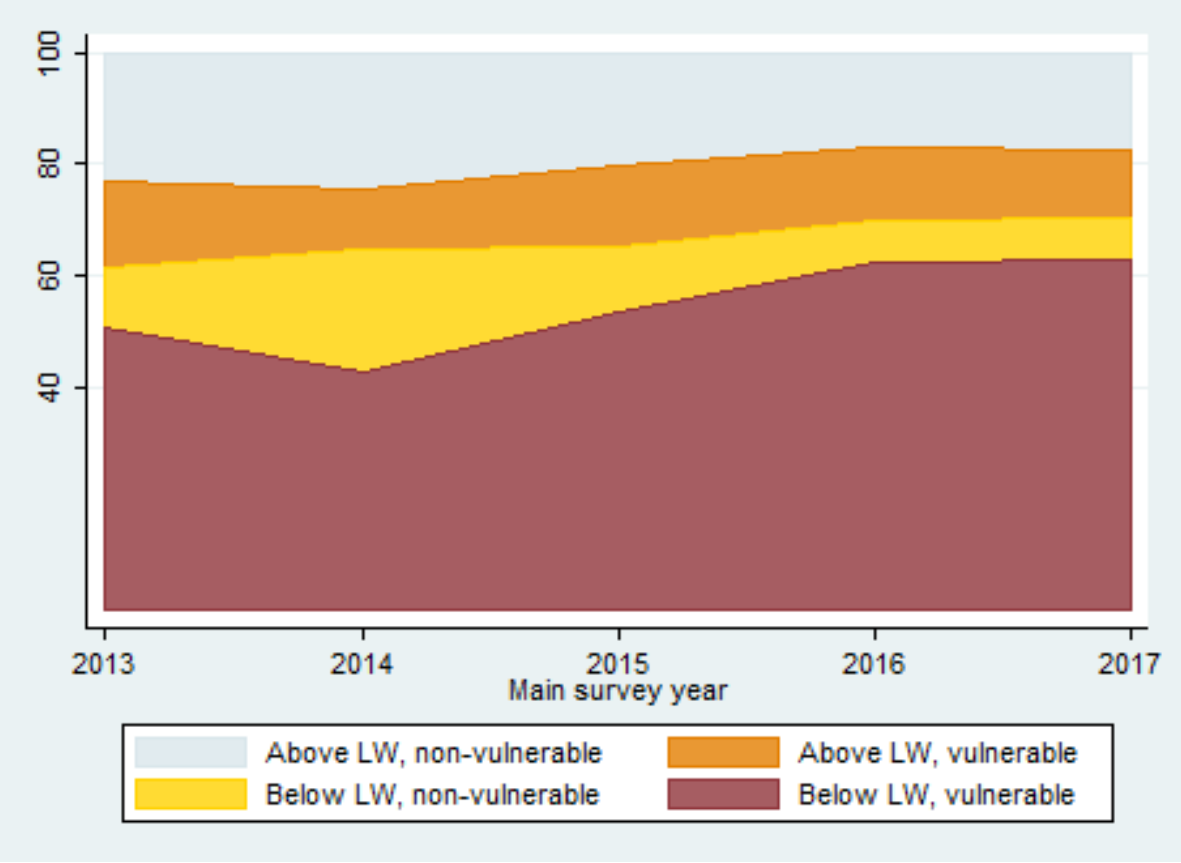


Figure: Percentage of entrepreneurs with profits above/below the living wage and classified as vulnerable/non-vulnerable.

How stable are vulnerability groups after 2013?

		Average no. of periods spent	
Status in 2013	N	Below LW	Above LW
Below LW, vuln.	123	3.35	0.65
Below LW, non-vuln.	26	2.07	1.93
Above LW, vuln.	37	2.27	1.73
Above LW, non-vuln.	56	1.66	2.18
Total	242	2.65	1.35

Table: Classification in 2013 vs. development 2014-2017.

Characteristics of the vulnerable

The vulnerable are significantly more likely to have the following characteristics

- **entrepreneur:** female, low schooling, lower cognitive ability, unmarried, credit constrained
- **household:** FHH, less wealthy, less working members
- **industry sector:** hairdressing, tailoring, retail (remaining, clothing)
- **firm:** younger, smaller capital stock, no employees, not registered, not central Kampala

No significant differences: age, number of children

Conclusions

- The ILO definition of vulnerable employment as own-account work and contributing family work is only partly successful in correctly identifying the economically vulnerable.
- More than 60% of the entrepreneurs in the sample earn profits below the living wage for a standard family, often with little upward mobility.
- A small share of entrepreneurs consistently earn more than the living wage and are not vulnerable.

Thank you!

Vulnerability and household income: supplementary businesses?

Allowing the living wage to vary with family composition hardly changes classifications.

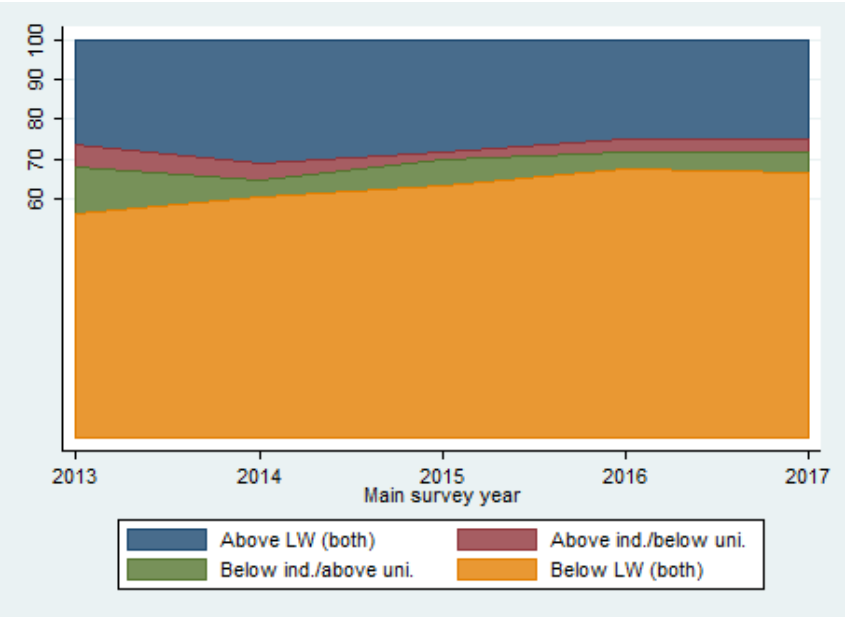


Figure: Percentage of entrepreneurs with profits below living wage, adjusted for household composition vs. uniform.

Vulnerability and household income: supplementary businesses?

The vulnerable tend to contribute less to household income (but differences are small).

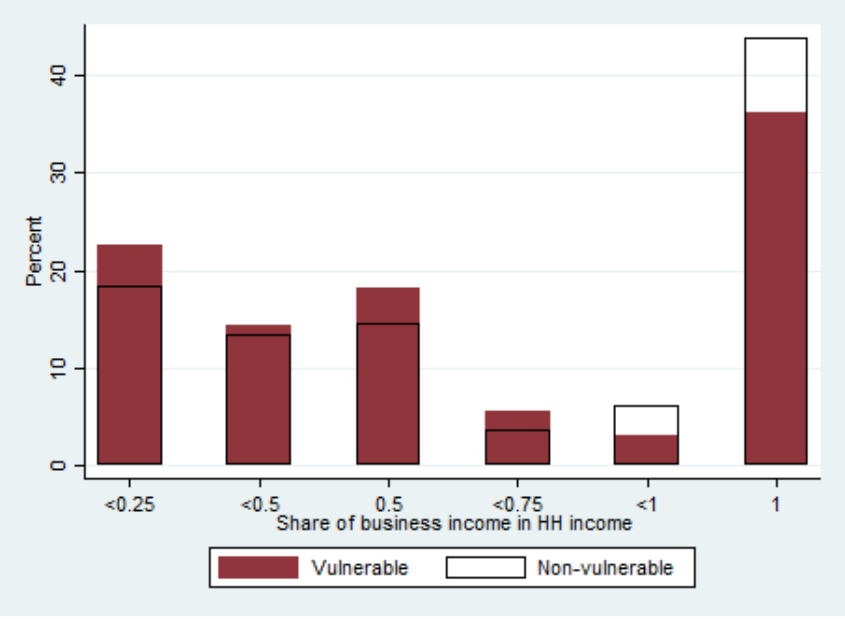


Figure: Share of business income in household income, vulnerable vs. non-vulnerable.

Vulnerability and household income: supplementary businesses?

The large majority of (vulnerable and non-vulnerable) entrepreneurs work at least full-time.

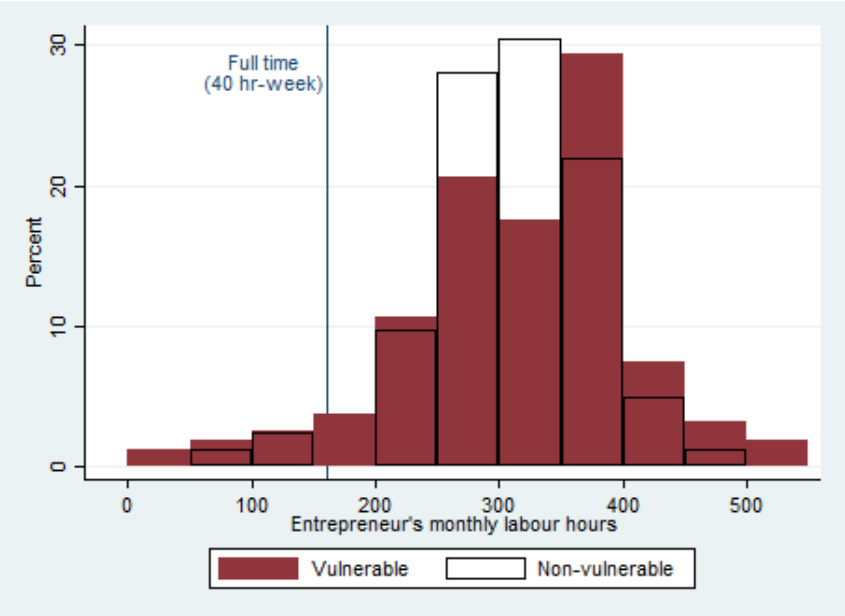


Figure: Monthly working hours, vulnerable vs. non-vulnerable.

Vulnerability and household income

It appears unlikely that those classified as vulnerable are simply running "supplementary" businesses.

- Number of wage earners in hh is *lower* on average for vulnerable, no difference in no. of children
- The vulnerable tend to contribute less to household income (more likely to be one of two earners, less likely to be sole breadwinner)
- Number of "part-time" businesses is negligible for vulnerable and non-vulnerable.

Transforming profits: the inverse hyperbolic sine (IHS)

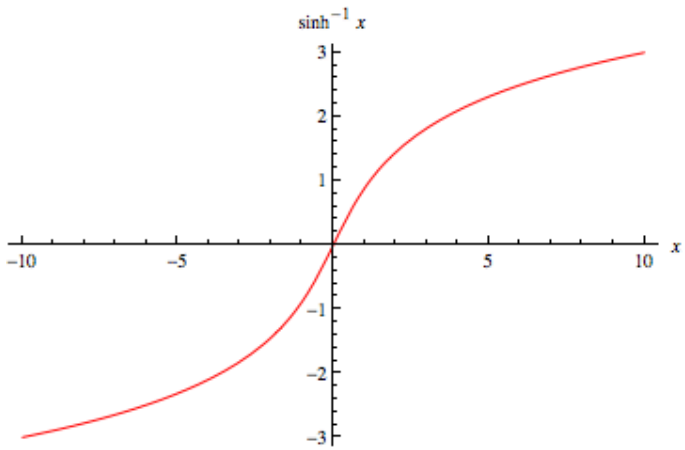


Figure: Inverse hyperbolic sine function. Source: wolframalpha.com

$$sinh^{-1}x = \frac{1}{i} sin^{-1}(ix) \tag{4}$$

Including non-positive profits: firm

Dep: profit (IHS)	RE	RE	FE
Capital stock (2012 USD)	0.104***	0.100***	0.098**
	(0.022)	(0.022)	(0.035)
Log labour hours	0.244***	0.234***	0.163**
	(0.047)	(0.046)	(0.054)
Firm age	0.023	0.023	0.008
	(0.015)	(0.015)	(0.034)
Firm age squared	-0.000	-0.000	0.000
	(0.001)	(0.001)	(0.002)
Registered with URA	0.339***	0.345***	0.316***
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Credit constrained	-0.119*	-0.115*	-0.070
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Industry sector: hair dressing and beauty	-0.478***	-0.477***	
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Industry sector: retail	-0.023	-0.021	
	(0.085)	(0.084)	
Industry sector: other	-0.289	-0.270	
	(0.163)	(0.158)	
Central division	0.326***	0.322***	
	(0.079)	(0.080)	

Back to main results

Including non-positive profits:entrepreneur

Dep: profit (IHS)	RE	RE	FE
Age in years	0.041	0.043	-0.045
	(0.026)	(0.027)	(0.151)
Age squared	-0.001*	-0.001*	-0.001
	(0.000)	(0.000)	(0.001)
HH wealth, t-1	1.457***	1.476***	0.144
	(0.240)	(0.241)	(0.474)
Female	-0.375***	-0.351***	
	(0.086)	(0.088)	
Edu: completed O-level	0.078	0.072	
	(0.097)	(0.100)	
Edu: completed A-level	-0.004	-0.016	
	(0.136)	(0.142)	
Edu: completed university	-0.027	-0.030	
	(0.149)	(0.153)	
Cognitive ability	0.057	0.053	
	(0.033)	(0.033)	

Back to main results

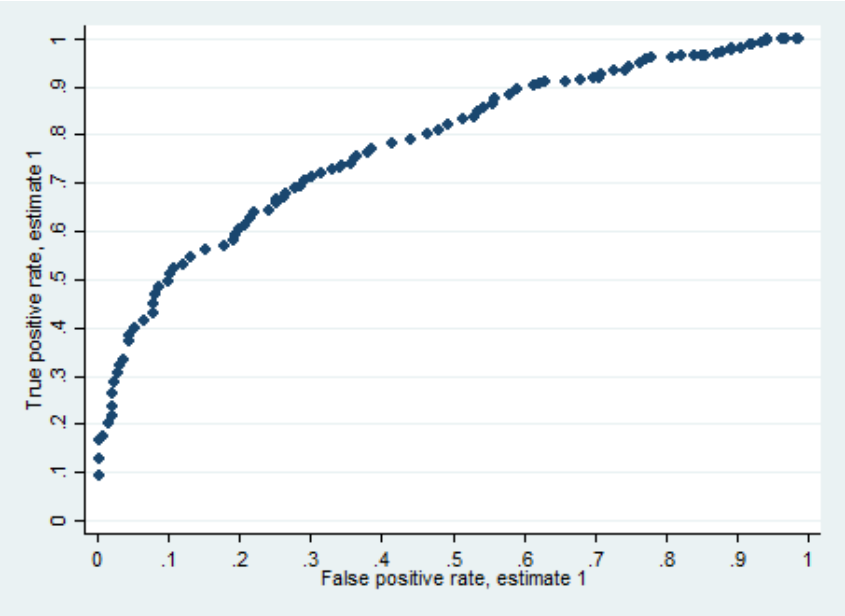
Including non-positive profits:shocks

Dep: profit (IHS)			
	RE	RE	FE
Dummy for non-positive profits	-10.061***	-10.052***	-10.107***
	(0.480)	(0.480)	(0.179)
Health shock		-0.131	-0.086
		(0.097)	(0.103)
Bus. temporarily closed		-0.031	0.178
		(0.142)	(0.144)
Divorced or widowed		-0.289*	-0.314
		(0.146)	(0.216)
Household lost wage earner		0.054	0.062
		(0.090)	(0.104)
Household asset shock		-0.029	0.122
		(0.131)	(0.130)
R-squared(overall)	0.796	0.797	0.602
R-squared(within)	0.800	0.799	0.802
R-squared(between)	0.783	0.799	0.355
N	1136	1131	1131
N(clusters)	243	243	

Notes: clustered standard errors in parentheses. * p<0.05, ** p<0.01, *** p<0.001.
Time dummies included.

▸ Back to main results

The probability threshold



At threshold of 50%, we correctly identify 75% of those with inadequate earnings, and need to tolerate approx. 37% "false positives".