

Accounting for the Self-Employed

Ledgers of the Invisible Firm

Werner Hernani-Limarino

wernerhl@gmail.com

Agenda

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The Problem

A Story from El Alto

María runs a food stall in La Ceja.

Her week:

- Works 54 hours
- Her daughter helps 12 hours (unpaid)
- Takes home Bs 774 every Friday
- Records that as her “profit”

What she doesn't count:

- The value of her 54 hours
- Her daughter's 12 hours
- The Bs 20/day the family eats from inventory
- The Bs 100/month the cart loses in value

When the survey visits:

She reports Bs 774/week as net income.

The statistics office records:

another profitable informal firm.

What Does the Household Survey Say?

100%

of self-employed report positive income

What the survey implies:

- Everyone is profitable
- Median margin: 52%
- Informality is a viable alternative

The uncomfortable questions:

- Is it possible that *everyone* earns?
- Where are the failures?
- What are we missing?

43%

are **loss-making** under proper accounting

- 214 of 500 firms earn *less than zero*
- Median accounting gap: Bs 1,002/week
- 88% of the gap = uncoded labor

The Paradox

Survey: 100% profitable vs. Diary: 43% loss-making

Why the Difference?

Three costs the survey *never* captures:

1. Owner labor

- Median: 48 hours/week
- Valued at Bs 0/hour in the survey
- True cost: Bs 655/week at minimum wage

2. Family labor

- Spouses, children, parents who “help”
- Never recorded, never paid

3. Depreciation

- Tools, vehicles, equipment wear out
- No cost category in the survey

The Accounting Identity

Conventional Profit (what the survey captures)

$$\pi^{\text{conv}} = \text{Revenue} - \text{Costs paid to third parties}$$

Adjusted Profit (what should be measured)

$$\pi^{\text{adj}} = \pi^{\text{conv}} - \underbrace{w^* \times (h_{\text{owner}} + h_{\text{family}})}_{\text{imputed labor}} - \underbrace{\delta \times K}_{\text{depreciation}}$$

Where:

- w^* = Bs 13.64/hour (Bolivia's minimum wage)
- δ = sector-specific depreciation rate

Methodology

The Seven-Day Financial Diary

Design:

- 7 consecutive visits
- 30–40 minutes each
- At end of business day
- Strict double-entry accounting

Sample:

- 500 complete firms
- 588 recruited (85% completion)
- 25,338 transactions
- September–October 2024

Cities:

- La Paz / El Alto
- Cochabamba
- Santa Cruz
- Tarija

Sectors:

- Commerce (36%)
- Transport (23%)
- Manufacturing (13%)
- Food service (11%)
- Construction (10%)
- Professional services (7%)

Instrument Structure

Module	Content	What it captures
M1A	Cash sales	Daily revenue
M1B	A/R collections	Collections from prior credit sales
M1C	Own consumption	Family consumption from inventory
M2	Purchases	Raw materials and inventory
M3	Operating expenses	Transport, rent, utilities, wages
M4A	New loans	Financing received
M4B	Debt payments	Interest vs. principal breakdown
M5	Labor	Owner + family hours
M7	Transfers	Household ↔ firm withdrawals

Key Innovation

Module 4B decomposes each payment into interest (cost) and principal (not cost).

The survey only captures total.

We follow the Household Survey's first-stage design:

1. **Frame:** CNPV-2012 + ACM-2010-2012
2. **Stratification:** Department $\times$ urban/rural $\times$ socioeconomic stratum
3. **PSUs:** Selection of neighborhoods/enumeration areas
4. **Within PSU:** Random household sampling $\rightarrow$ eligibility screening
5. **Eligibility:** Self-employed in target sector
6. **Enrollment:** Consent + Day 0 (initial inventory)

Oversampling

Firms with active debt oversampled 2:1 to ensure statistical power for typology analysis.

Sample Characteristics

Sector	N	Female	Poor	Debt	Hours	Loss
Commerce	182	71%	34%	46%	50	45%
Transport	114	1%	36%	55%	56	41%
Manufacturing	67	43%	39%	54%	40	28%
Food service	54	83%	35%	46%	36	59%
Construction	50	0%	44%	58%	48	44%
Prof. services	33	46%	30%	30%	40	39%
Total	500	44%	36%	49%	48	43%

Patterns: Food service (83% female) has highest loss rate. Manufacturing lowest.

Shadow Wage Imputation

Why the minimum wage?

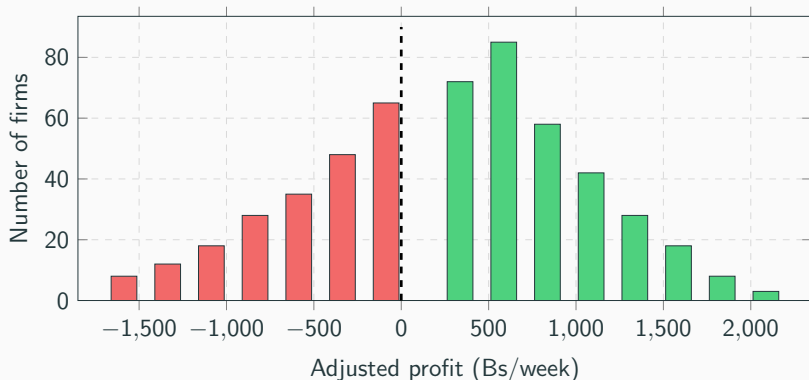
- It's the legal floor: Bs 2,362/month $\div$ 173.3 hours = Bs 13.64/hour
- It's the *minimum* opportunity cost of time
- It's conservative: the true cost may be higher

Table 1: Sensitivity to Shadow Wage

Shadow wage	Bs/hour	% loss-making
40% of minimum	5.46	12.2%
70% of minimum (ILO penalty)	9.55	28.8%
100% of minimum (baseline)	13.64	42.8%
120% of minimum	16.37	52.0%
Zero (ignore labor)	0.00	1.6%

Main Results

Result 1: 43% Are Loss-Making



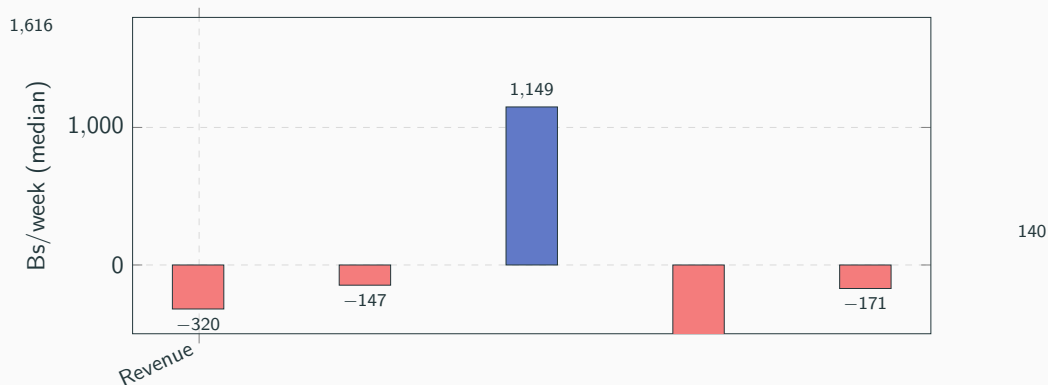
214 firms (43%)

Profit ≤ 0

286 firms (57%)

Profit > 0

Result 2: Gap Decomposition



Gap (Bs 1,002) decomposes as: Imputed labor: 88% Depreciation: 10%
Other: 2%

Result 3: Firm Typology

Type	N	%
I — Viable	278	55.6%
II — Precaria	172	34.4%
III — Debt-trapped	8	1.6%
IV — Critical Risk	42	8.4%
Total	500	100%

	Debt < 10%	Debt ≥ 10%
Profit > 0	Viable 55.6%	Trapped 1.6%
Profit ≤ 0	Precaria 34.4%	Critical 8.4%

Type II — Precaria: The Key Finding

172 firms (34%) = **disguised unemployment**. Positive cash flow, negative economic profit.

Result 4: Why Don't They Close?

Answer: Cash flow masks the accounting loss.

Of 214 loss-making firms:

98%

have **positive**
cash flow

Median cash flow: **Bs 807/wk**

Median profit: **Bs -276/wk**

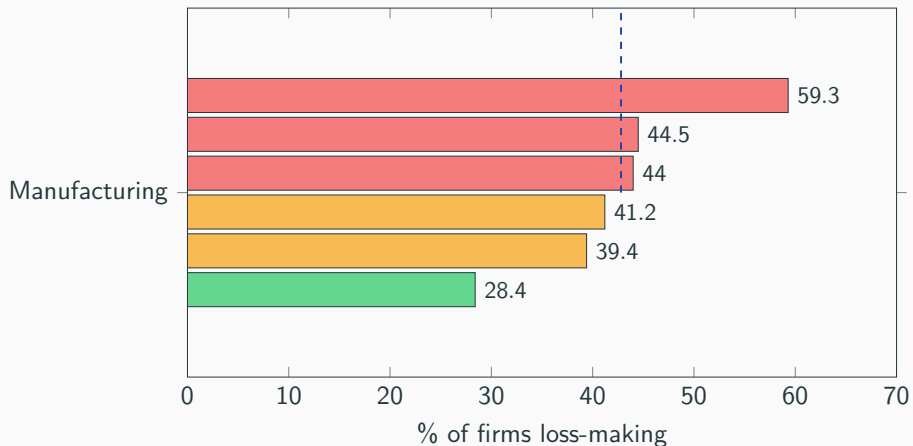
Why the disconnect?

- Imputed labor **never** leaves the till
- Depreciation is **never** invoiced
- Owner sees cash every day
- The firm *feels* viable
- No outside option (formal employment)

Implication

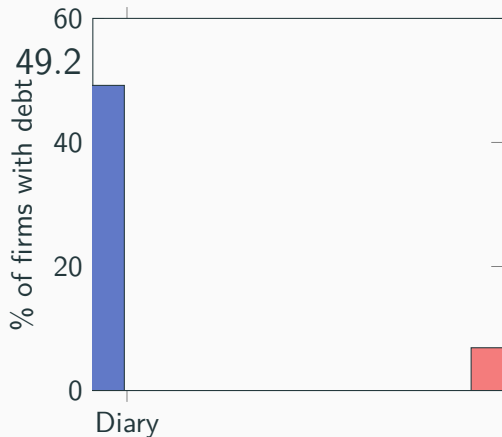
The owner doesn't perceive the loss because it's never in cash.

Result 5: Variation by Sector



Food service: 59% loss-making, 83% female. **Manufacturing:** 28%, lowest hours.

Result 6: Debt Detection



True prevalence: 49.2%

Survey detection: 6.9%

Detection rate: 14%

Informal moneylenders:

- Median EAR: **186%**
- Undetected: 93%
- Charge daily or weekly
- Never appear as “installment”

6.9

Result 7: Tobin's Q

For viable firms ($N = 286$):

$$Q = 5.7$$

Interpretation:

- $Q = 1$: Worth its physical assets
- $Q = 5.7$: Worth $5.7\times$ its tools
- The premium ($4.7\times$) = invisible capital

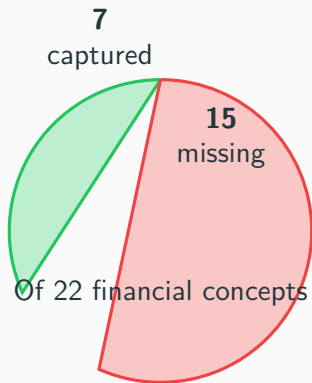
Invisible capital:

- Stall location
- Loyal customers
- Operational knowledge
- Reputation

Policy Implication

This capital **cannot be collateralized** without formal title. Formalization could unlock it.

Result 8: Measurement Scorecard



The 9 critical concepts missing:

1. Owner hours (captured but not costed)
2. Family labor
3. Depreciation
4. Informal debt
5. Opening/closing inventory
6. Accounts receivable
7. Accounts payable
8. Own consumption
9. Interest/principal breakdown

Conclusion

The survey cannot identify loss-making firms because all 4 determinants of the loss threshold are absent.

Implications

Implication 1: Poverty Targeting

The problem:

- 97% of loss-making firms show *positive* income in survey
- 17% classified poor by survey
- 69% classified poor by diary
- **Gap: 52 percentage points**

Policy Consequence

Proxy means tests using survey income will **systematically exclude** the disguised unemployed from social protection.

The magnitude:

910,000

workers
misclassified

More than the population of El Alto

Implication 2: Formalization Policy

What current policy assumes:

- All informal firms are formalizable
- Informality is a choice
- Incentives + simplification = formalization

Typical interventions:

- One-stop shops
- Reduced paperwork
- Tax incentives

What the data show:

- 43% of firms **are not formalizable**
- They are employment refuges, not viable businesses
- Formalizing them = imposing additional costs

Implication:

- Distinguish viable from precaria
- Social protection for precaria
- Formalization only for viable

Implication 3: Informal Debt Trap

The trap circuit:

1. Firm with irregular cash flow
2. Needs working capital
3. Banks won't lend (no collateral)
4. Goes to informal moneylender
5. EAR of 186% (median)
6. Weekly payment consumes profit
7. Never accumulates capital
8. Returns to moneylender

Type IV: Critical Risk

42 firms (8.4%) are:

- Operating at a loss
- AND paying $\geq 10\%$ of revenue in interest

These firms cannot exit without external intervention.

Implication 4: Gender

	Female	Male	Difference
N	220	280	
% of sample	44%	56%	
Loss rate	48.2%	38.6%	+9.6 pp
Hours/week	42	52	−10 hrs
Median profit	Bs 85	Bs 198	−57%
Dominant sector	Food service (83%) Commerce (71%)	Transport (99%) Construction (100%)	

Pattern: Women concentrate in sectors with higher loss rates (food service, commerce). The gender gap in viability reflects sectoral segregation.

Conclusion

Summary of Findings

1. **43% of informal firms are loss-making** under proper cost accounting
2. The accounting gap (Bs 1,002/wk) is **88% imputed labor**
3. Loss-making firms persist because **cash flow is positive** even when profit is negative
4. The survey detects only **7% of true debt** — missing lenders at 186% EAR
5. For viable firms, Tobin's $Q = 5.7$ — substantial invisible capital
6. **910,000 workers** potentially misclassified in poverty targeting

For social protection:

- Don't use survey income to target self-employed
- Develop proxy indicators that capture viability
- Recognize disguised unemployment

For formalization:

- Distinguish viable from precaria
- Formalize only the viable
- Protect (don't formalize) precaria

For financial inclusion:

- Regulate informal lenders
- Expand formal microcredit
- Working capital products

For measurement:

- Add costed-hours module
- Capture informal debt
- Opening/closing inventory

Replication data:

<https://doi.org/10.7910/DVN/KZMHGU>

Interactive dashboard:

<https://github.com/wernerhl/ledgers-bolivia>

Contact:

wernerhl@gmail.com

Repository contents

- 3 CSV files (firms, accounts, transactions)
- Complete codebooks
- Replication script (Python)

File folder structure (as published on GitHub)

Thank You

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Werner Hernani-Limarino

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