

Credit Source and Enterprise Performance in Urban Maharashtra

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ABSTRACT

Fewer than one unincorporated enterprise in ten in urban Maharashtra holds an outstanding loan. This paper asks whether formal and informal credit are associated with enterprise performance, and whether the two differ. Using three rounds of the Annual Survey of Unincorporated Sector Enterprises, 50,992 enterprises from 2021-22 to 2023-24, gross value added is regressed on separate indicators for institutional and non-institutional credit with district-clustered standard errors. Formal credit is associated with gross value added about 17 percent higher. Informal credit shows none, and equality of the two is rejected at $p = 0.00002$. A survey of 18 market enterprises suggests ASUSE may undermeasure informal credit rather than measure it imprecisely. Supplier credit dominates there and is priced as a markup on goods, so it carries no outstanding amount for the secondary survey to record. Credit is not randomly assigned, so these are upper bounds on any causal effect.

Keywords: informal sector; credit access; enterprise performance; gross value added; supplier credit; India

Research Question: To what extent is access to formal and to informal credit each associated with the gross value added of unincorporated non-agricultural enterprises in urban Maharashtra between 2021-22 and 2023-24, and do the two sources differ in the strength of that association?

1. Introduction

Informal activity makes up close to a third of output in emerging and developing economies and around 70 percent of their employment [1]. In India the scale shows at the level of the firm. ASUSE counted 7.34 crore unincorporated establishments in 2023-24, up from 6.50 crore: retail stalls, small manufacturing units, repair shops and eateries, most run by one person.

Almost none of them borrow. In urban Maharashtra across three rounds, 92.4 percent of enterprises hold no outstanding loan at all. Only 4.8 percent hold one from an institutional lender

and 3.0 percent from a moneylender, a supplier or a relative. Whether that near-absence of credit matters for how these enterprises perform is the question this paper takes up.

There is reason to think it should matter, and that the source matters as much as the presence. Stiglitz and Weiss [2] showed that lenders who cannot observe borrower risk ration credit by refusing loans rather than raising rates. For enterprises with no collateral, no accounts and no credit history, that predicts exclusion rather than expensive access. Informal lenders fill the gap, but their loans are smaller, shorter and often tied to goods.

This paper takes up that gap for one state. It asks whether formal and informal credit are associated with the gross value added of unincorporated enterprises in urban Maharashtra, and whether the two sources differ. Maharashtra is among the three largest state contributors to unincorporated sector value added. Vidyarani and Maheshkumar [3] show that the determinants of formal credit access differ across Indian regions, which makes a state-level estimate worth having.

The paper makes four contributions. It is the first econometric analysis of credit and enterprise performance on ASUSE unit-level data. It keeps formal and informal credit separate rather than averaging them into an access index. It disaggregates to the individual lender. And it states the identification problem rather than working around it, since Badola and Mukherjee [4] use gross value added to predict credit access in this same survey family, which is this specification reversed.

The secondary results can be stated briefly. A formal loan is associated with gross value added about 17 percent higher than otherwise comparable enterprises. Informal credit shows no such association, and a test of whether the two coefficients are equal is rejected with a p-value of 0.00002. Disaggregating by lender gives an ordering that follows how formal the lender is.

Section 2 reviews the literature, Section 3 the sector and its credit environment, and Section 4 the framework. Section 5 covers the data and empirical strategy, Section 6 the results and Section 7 their sensitivity. Section 8 reports field evidence on informal credit and Section 9 concludes.

2. Related Literature

2.1 Measuring Informality and the Informal Firm

Informality at the firm level is several things at once: registration, record-keeping, tax compliance, how labour is hired. La Porta and Shleifer [5] argue that informal firms are not formal firms held back by regulation but mostly less productive operations run by less educated

entrepreneurs. ASUSE sidesteps the argument by sampling on legal form, which gives a clean frame and pools enterprises differing in every other respect.

2.2 What determines access to credit

Badola and Mukherjee [4] estimate a probit model of formal credit access on NSSO unincorporated enterprise data. Enterprise size, gross value added, turnover, bank account, registration and entrepreneur gender all come out significant, and Vidyarani and Maheshkumar [3] find the determinants are not stable across regions either. Two things follow. Gross value added predicts credit access in these studies, so putting it on the left and credit on the right cannot be read as causal, which Section 5.2 returns to. This literature also supplies a tested control set from the same survey family.

2.3 Credit and enterprise performance

Experiments yield the most reliable evidence that capital constraints bind. De Mel et al. [6] distributed grants at random to Sri Lankan microenterprises, yielding real returns to capital of about 5.7 percent per month, far above prevailing rates. Besides, among women-owned enterprises the average return was indistinguishable from zero.

Observational research reaches the same conclusion, though with weaker identification. Posti et al. [7] build a pseudo panel from NSSO rounds to 2015-16 and find both formal and informal finance positively related to productivity, formal more strongly. Kumarasamy et al. [8] report that financial access correlates positively with value added per worker, the closest precedent for the outcome here.

Whether informal credit works the same way is an open discussion. Ayyagari et al. [9] found it does not: firms in China financed informally showed no growth advantage, whereas bank-financed firms grew six to ten percentage points faster. According to Degryse et al. [10], informal finance serves small enterprises through an informational advantage but cannot scale. Maharashtra-specific evidence is thin. Dutta and Dhar [11] find textile firms unable to access formal credit become subcontractors, earning only a processing fee instead of the full margin on output, so credit constraints could depress measured value added by changing what the enterprise does.

3. Background

3.1 The unincorporated sector

An unincorporated enterprise is not registered as a company and has no legal identity separate from its owner. Own-account enterprises run on the proprietor alone or with unpaid family help,

without hired workers on a regular basis. Establishments employ at least one hired worker regularly. Own-account enterprises make up about three quarters of the urban Maharashtra sample, and the median enterprise of either type employs one person.

They are small in absolute terms too. The median gross value added during the reference period is approximately 14,400 rupees and Gautam and Dhanya [12] found that more than 90 per cent of unincorporated enterprises nationally fall below a quarter of the turnover threshold for micro enterprise classification. Maharashtra sits near the top of this distribution. The 2023-24 press note by ASUSE [13] also mentions it as one of the three biggest contributors to the value added in the unincorporated sector, along with Uttar Pradesh and Gujarat, and urban Maharashtra alone accounts for about 38 lakh enterprises.

3.2 What ASUSE measures

ASUSE began in 2021-22, replacing the periodic National Sample Survey rounds on unincorporated non-agricultural enterprises, the last of which covered 2015-16. Three comparable annual rounds now exist where researchers previously had cross-sections five years apart.

The survey records receipts and operating expenses and computes gross value added as output less intermediate consumption. It is calculated inside the interviewing software rather than left to the respondent, which removes one source of error among enterprises that keep no books.

ASUSE also carries a finance block recording outstanding loan amounts by lending agencies. Four of those agencies are institutional: commercial banks, cooperative banks and societies, government, and microfinance institutions or self-help groups. Three are non-institutional: moneylenders, suppliers or contractors, and friends and relatives. Those seven are the agencies reported separately in Table 5, and the two aggregate indicators used throughout are built from the same seven. Splitting them into institutional and non-institutional follows the convention used in Indian credit statistics.

One feature of that block matters for everything that follows. It records credit as an amount outstanding on the reference date. Credit that carries no balance, because it is settled inside the price of goods or repaid before the date of interview, is outside what the instrument can record at all. Section 8 returns to this.

3.3 The credit environment

Indian policy has long steered institutional credit toward small enterprises. Priority Sector Lending obliges banks to allocate a set share of credit to designated sectors, and Banerjee and

Duflo [14] show that expanding it raised the sales and profits of affected firms rather than crowding out borrowing they would have found anyway. MUDRA and PM SVANidhi target the smaller end directly.

Take-up suggests most enterprises of this size have not been reached. Fewer than one in twenty holds an institutional loan. The data cannot say whether that reflects a supply constraint or an absence of demand. What it can show is how enterprises with credit differ from those without, and whether that depends on who lent to them.

4. Conceptual Framework

4.1 Why credit is rationed rather than priced

The framework is the credit rationing model of Stiglitz and Weiss [2]. Past some interest rate the lender's expected return falls, because a higher rate drives the safer borrowers out and leaves the riskier ones, and because it gives borrowers reason to take on more risk once the loan is made. The lender's best response is to stop lending rather than charge more.

The enterprises ASUSE surveys are close to the limiting case: unregistered by definition, mostly keeping no accounts, rarely holding collateral, never holding a credit history. The model predicts not that they borrow at high rates but that they are shut out. Take-up under five percent fits that, though it also fits an absence of.

4.2 Why informal credit persists

If institutional lenders cannot screen these borrowers, how anyone lends to them at all is the question, and the answer is transaction costs. A moneylender working a single market, a supplier who has traded with the same stall for years, or a relative in the same household holds information no bank can buy, and each can enforce repayment by means a bank cannot use. What informal lending cannot do is scale. A moneylender's capital is limited, supplier credit is tied to specific goods rather than advanced as cash, and family loans are bounded by one household's resources. Degryse et al. [10] formalise this as informational advantage against scalability.

4.3 Why the two are kept separate

Formal and informal credit are therefore not interchangeable measures of access to finance. An institutional loan arrives as cash, in a size and over a term that can change the scale of the enterprise. Informal credit is usually working capital, tied to a consignment of stock and repayable within weeks. Only the first can relax a constraint on productive capital, which is why the two enter separately throughout.

4.4 Predictions

The framework makes three predictions, each mapping onto a coefficient in the equation in Section 5.2.

Prediction 1: Assuming that the capital constraint is binding, those firms that have a formal loan should have a higher gross value added than those that do not have a formal loan but are otherwise similar. The coefficient of formal credit should be positive.

Prediction 2: Informal loans are smaller, shorter and typically secured by goods as opposed to cash, and therefore they are less likely to support a shift in productive capacity. The coefficient of informal credit should be lower than the coefficient of formal credit. Its sign is left open, because the literature disagrees on whether it is positive or zero.

Prediction 3: If the two types of credit are not two measures of the same thing, the coefficients should differ by a detectable amount. That is the assumption which warrants estimating them separately, and it is testable as a linear restriction.

These predictions are about association, not causation. The framework explains why credit might raise performance, and read the other way it explains why a rationing lender would pick enterprises already performing well, since observable performance is what such a lender screens on.

5. Data and Methods

5.1 Data

Source and validation

The data are unit-level records from three ASUSE rounds covering 2021-22 to 2023-24, from cleaned extracts published by Advait Moharir and Vijayshree Jayraman. Because the cleaning was third-party, the extracts were checked against MOSPI's totals [13]: the survey multipliers on the 2022-23 file give 6.50 crore establishments, exactly the published figure.

The documentation folder is not in the repository, so several variables were decoded from the data itself. The enterprise type indicator runs in reverse of the Schedule 2.34 convention. Years of operation are banded, so the recorded start year is used to build a continuous measure instead.

Sample

The data are restricted to Maharashtra, to the urban sector, and to units surveyed and responding, giving 53,002 enterprises. The estimation sample is 50,992 after dropping observations missing a control and 68 reporting gross value added of zero or less.

Outcome variable

Performance is measured by gross value added. The distribution is heavily skewed, a median of about 14,400 rupees against a mean of about 40,900, so the dependent variable is the natural logarithm.

Credit variables

ASUSE records the amount outstanding by lending agency, grouped using the split in Section 3.2. Two binary indicators follow, one for any formal loan and one for any informal loan. They enter separately and are never combined. The loan fields are empty rather than zero when no loan is held, confirmed by checking that non-missing values equal strictly positive values in every round and source. Missing is treated as zero, since dropping those would discard the 92 percent holding no credit.

Three limitations follow. The measure is a stock at interview, so an enterprise that borrowed and repaid within the year counts as having none. And the survey asks whether a loan is held, not why one is absent, so a rejected applicant cannot be told apart from one who never applied. Third, credit that is never expressed as a debt is invisible to the instrument. Supplier credit priced as a markup on goods has no principal and no balance owed, so an enterprise using it is recorded as holding no informal credit at all, which makes the informal indicator a lower bound on informal borrowing rather than a measure of it. Section 8.3 gives evidence that this form is common among the enterprises surveyed there.

Controls

The control set follows Badola and Mukherjee [4]: log total workers, years of operation, education, own-account status, proprietor gender, social group, registration, written accounts, and whether the enterprise has fixed premises. Sector models add industry fixed effects and pooled models round fixed effects. Registration and record-keeping are markers of formalisation and strongly related to credit access, so including them makes the credit coefficient a comparison between enterprises that look similar on paper. That makes the estimate conservative.

Descriptive picture

Table 1 reports summary statistics. The median enterprise employs one person, three quarters are own-account, and only eight percent keep written accounts. Table 2 shows how rare credit is (Figure 1): 92.4 percent hold none, 4.8 percent a formal loan, 3.0 percent an informal one.

Table 1. Descriptive summary statistics

Variable	Mean	Median	SD	Min	Max	N
Gross value added (Rs)	40,930	14,440	5,11,473	10.00	5,13,82,004	50,992
Log gross value added	9.56	9.58	1.19	2.30	17.75	50,992
GVA per worker (Rs)	13,451	10,536	29,947	10.00	30,06,361	50,992
Formal credit (0/1)	0.05	0.00	0.21	0.00	1.00	50,992
Informal credit (0/1)	0.03	0.00	0.17	0.00	1.00	50,992
Formal loan outstanding (Rs)	37,396	0.00	9,01,872	0.00	11,06,01,853	50,992
Informal loan outstanding (Rs)	9,568	0.00	5,25,783	0.00	7,32,41,972	50,992
Workers	2.01	1.00	2.46	1.00	126.00	50,992
Years operating	11.44	8.00	9.92	0.00	77.00	50,992
Education level (1-6)	4.10	4.00	1.36	1.00	6.00	50,992
Own-account enterprise (0/1)	0.74	1.00	0.44	0.00	1.00	50,992
Female-owned (0/1)	0.29	0.00	0.45	0.00	1.00	50,992
Registered (0/1)	0.51	1.00	0.50	0.00	1.00	50,992
Maintains accounts (0/1)	0.08	0.00	0.28	0.00	1.00	50,992
No fixed premises (0/1)	0.13	0.00	0.33	0.00	1.00	50,992

Note. Estimation sample of 50,992 enterprises. Monetary values in rupees.

Source: Author's calculations from ASUSE unit-level records, 2021-22 to 2023-24, urban Maharashtra (Ministry of Statistics and Programme Implementation, 2025).

Table 2. Credit incidence by round

Round	N	Enterprises (lakh)	Formal %	Informal %	Both %	No credit %
2021-22	15,891	29.69	4.99	2.58	0.17	92.60
2022-23	17,202	33.94	5.14	3.52	0.26	91.59
2023-24	19,909	38.47	4.36	2.92	0.22	92.94
Pooled	53,002	102.10	4.81	3.01	0.22	92.40

Note. Enterprise counts use ASUSE survey multipliers. Incidence shares are unweighted.

Source: Author's calculations from ASUSE unit-level records, 2021-22 to 2023-24, urban Maharashtra (Ministry of Statistics and Programme Implementation, 2025).

Table 3 shows the raw gradient before controls. Median gross value added is 14,300 rupees with no credit, 16,640 with informal credit only, 21,800 with a formal loan and 41,265 with both. That ordering is also what selection alone would produce.

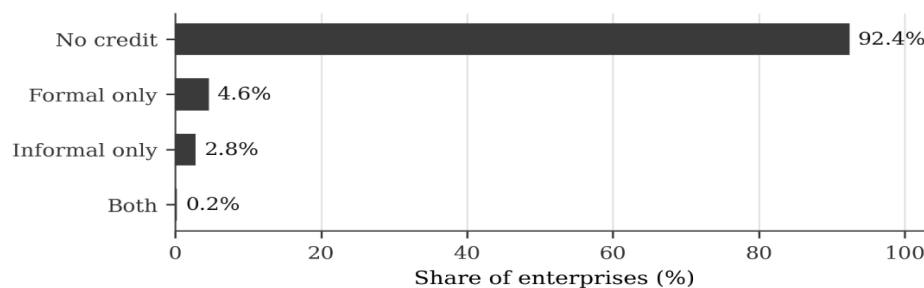
Table 3. Gross value added by credit status

Credit status	N	Share %	Median GVA	Mean GVA	Median workers
Neither	48,974	92.40	14,300	73,225	1.00
Informal only	1,481	2.79	16,640	1,63,206	2.00
Formal only	2,432	4.59	21,800	2,42,224	2.00
Both	115	0.22	41,265	9,21,621	3.00

Note. Raw differences with no controls applied. Rupees.

Source: Author's calculations from ASUSE unit-level records, 2021-22 to 2023-24, urban Maharashtra (Ministry of Statistics and Programme Implementation, 2025).

Figure 1. Credit held by urban Maharashtra enterprises



Note. Pooled across ASUSE 2021-22 to 2023-24. n = 53,002. Shares are unweighted.

Source: Author's calculations from ASUSE unit-level records, 2021-22 to 2023-24, urban Maharashtra (Ministry of Statistics and Programme Implementation, 2025).

5.2 Methods

Estimating equation

The estimating equation is:

$$\ln(\text{GVA})_i = \alpha + \beta_1 \text{Formal}_i + \beta_2 \text{Informal}_i + \gamma' X_i + \delta_s + \theta_t + \varepsilon_i$$

The subscript i indexes the enterprise, X is the control set above, and the Greek terms are full sets of industry and round fixed effects. Standard errors are clustered by district, of which there are 35.

The coefficients of interest are the two credit terms. The dependent variable is logged and the regressors binary, so each approximates the proportional difference in value added against otherwise similar enterprises holding no credit.

Each specification is reported unweighted and with survey weights. The unweighted estimate describes the sampled enterprises, the weighted one the population ASUSE represents. Where they differ both are reported.

What this design can and cannot identify

Credit is not randomly assigned, and the most serious threat is reverse causality. A lender advancing money to an unregistered enterprise with no collateral has very little to screen on and will use whatever observable signs of viability exist. Badola and Mukherjee [4] show gross value added predicting formal credit in this same survey family.

Omitted variables are the second threat. Entrepreneurial ability is unobserved and plausibly raises both the chance of a loan and the value added generated, biasing the formal coefficient upward. The controls for education, record-keeping and registration capture some of this, not all.

Both biases push the same way, so the formal coefficient is best read as an upper bound on any causal effect. Raj and Sen [15] instrument credit access using local supply-side variation and Gang et al. [16] use matching with difference-in-differences. Neither route is taken here. Every estimate reported below is a conditional association, and no coefficient in this paper should be read as the effect of credit on performance.

One thing the design identifies cleanly is the comparison between the two credit types. Whatever selection operates on formal borrowers operates on informal ones too, so selection alone would inflate both. One being large and the other zero is harder to explain that way.

6. Results

This section reports the estimates. Section 7 establishes which specification choices they survive. Section 8 asks whether the informal credit variable is measuring the right thing.

6.1 Formal and informal credit

Table 4 reports the main estimates. Column 1 includes only the credit indicators and both are positive and significant. Column 2 adds size and age and the picture changes at once: formal falls to 0.28, informal to 0.07 and loses significance. Most of the raw gap in Table 3 was a size effect.

Column 4 is preferred, adding the full control set and industry fixed effects (Figure 2). Formal credit carries 0.156, about 17 percent, with a standard error of 0.037. Informal credit carries minus 0.018, indistinguishable from zero. The weighted column 5 gives 0.267 and 0.048.

The asymmetry is the central result, so it is tested rather than asserted. The restriction that the two coefficients are equal is rejected decisively: the difference is 0.174 with a standard error of 0.041 and a p-value of 0.00002. Combined into a single access index, as originally planned, they would have produced one positive coefficient of intermediate size and this result would not have been visible.

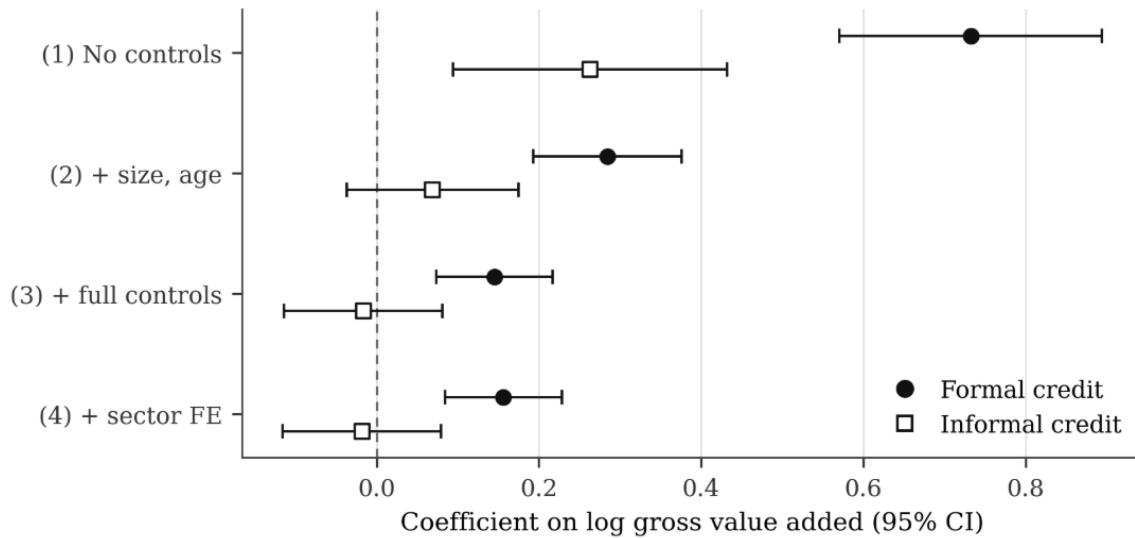
Table 4. Formal and informal credit and log gross value added

Model	Formal credit	Informal credit	Controls	N	R2
(1)	0.732*** (0.083)	0.263*** (0.086)	None	50,992	0.018
(2)	0.285*** (0.047)	0.069 (0.054)	Size, age	50,992	0.483
(3)	0.145*** (0.037)	-0.016 (0.050)	Full, no sector FE	50,992	0.642
(4)	0.156*** (0.037)	-0.018 (0.050)	Full + sector FE	50,992	0.660
(5)	0.267*** (0.057)	0.048 (0.045)	Full + sector FE, survey-weighted	50,992	0.639

Note. Standard errors clustered by district in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Test of equality of the two coefficients in model (4): difference 0.174, standard error 0.041, $p = 2.43e-5$.

Source: Author's calculations from ASUSE unit-level records, 2021-22 to 2023-24, urban Maharashtra (Ministry of Statistics and Programme Implementation, 2025).

Figure 2. Coefficients on formal and informal credit as controls are added



Note. 95 percent confidence intervals. Dependent variable is log gross value added. Standard errors clustered by district. Specification (4) is the preferred model.

Source: Author's calculations from ASUSE unit-level records, 2021-22 to 2023-24, urban Maharashtra (Ministry of Statistics and Programme Implementation, 2025).

6.2 Which lenders

Table 5 replaces the two indicators with seven, one per lending agency. The pattern follows how formal the lender is. Commercial banks carry 0.238, government lending 0.161 and cooperative banks 0.099, all significant at one percent. Microfinance carries 0.079 and is not significant, and none of the three informal sources is (Figure 3).

The ordering says two things. The categories are not internally uniform, and microfinance behaves more like informal lending than its classification implies. The four agencies associated with higher value added are all institutional ones. Holdings run from 363 to 1,102 enterprises, so the ordering is indicative.

Table 5. Individual credit sources

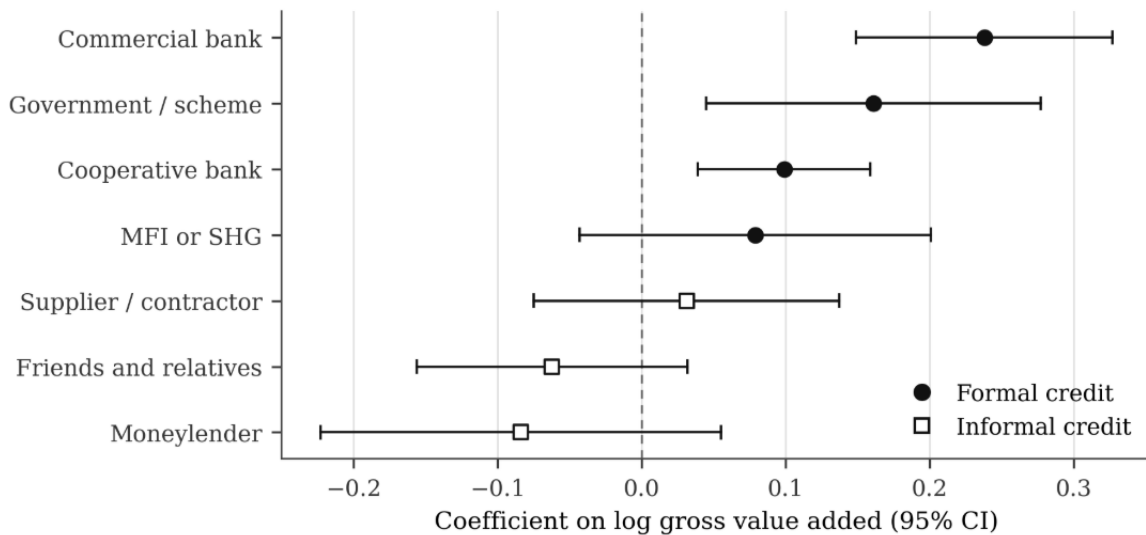
Lender	Type	Coefficient	SE	p	N holding	% holding
Commercial bank	Formal	0.238***	0.045	0.000	791	1.55
Cooperative bank/society	Formal	0.099***	0.031	0.001	605	1.19

Lender	Type	Coefficient	SE	p	N holding	% holding
Government / scheme	Formal	0.161***	0.059	0.007	363	0.71
MFI or SHG	Formal	0.079	0.062	0.205	587	1.15
Moneylender	Informal	-0.084	0.071	0.237	59	0.12
Supplier or contractor	Informal	0.031	0.054	0.563	350	0.69
Friends and relatives	Informal	-0.062	0.048	0.195	1,102	2.16

Note. All seven lender indicators entered simultaneously with the full control set. These are the same seven agencies described in Section 3.2.

Source: Author's calculations from ASUSE unit-level records, 2021-22 to 2023-24, urban Maharashtra (Ministry of Statistics and Programme Implementation, 2025).

Figure 3. Coefficients on each lending agency



Note. All seven lender indicators entered simultaneously with the full control set, ordered by size. Filled circles are institutional lenders, open squares non-institutional. The four lenders whose intervals exclude zero are all institutional.

Source: Author's calculations from ASUSE unit-level records, 2021-22 to 2023-24, urban Maharashtra (Ministry of Statistics and Programme Implementation, 2025).

6.3 Control coefficients

Table 6 reports the controls. The elasticity of value added with respect to employment is 0.77, the largest coefficient in the table. Own-account enterprises show 0.45 log points less than

establishments of the same measured size. Registration is associated with 0.32 and written accounts with 0.35.

The largest coefficient among the binary controls is on female ownership, at minus 0.52 log points. A gap that size, conditional on sector, size, education and registration, echoes De Mel et al. [17] and deserves separate treatment.

Table 6. Control coefficients, preferred specification

Variable	Coefficient	SE	p
Log workers	0.769***	0.036	0.000
Years operating	0.003***	0.001	0.000
Own-account enterprise	-0.447***	0.031	0.000
Female-owned	-0.517***	0.041	0.000
Registered	0.324***	0.033	0.000
Maintains accounts	0.349***	0.040	0.000
No fixed premises	0.124***	0.022	0.000
Education level 2 (vs 1)	0.066**	0.027	0.013
Education level 3 (vs 1)	0.082***	0.019	0.000
Education level 4 (vs 1)	0.132***	0.025	0.000
Education level 5 (vs 1)	0.177***	0.021	0.000
Education level 6 (vs 1)	0.306***	0.018	0.000

Note. Preferred specification is model (4) of Table 4. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Source: Author's calculations from ASUSE unit-level records, 2021-22 to 2023-24, urban Maharashtra (Ministry of Statistics and Programme Implementation, 2025).

6.4 How these estimates compare with existing ones

The estimates sit between the two closest studies rather than matching either. Posti et al. [7] find both formal and informal finance positively related to productivity. These results show formal credit positively associated with value added and informal credit not associated at all, closer to Ayyagari et al. [9] Three differences could account for the divergence from Posti et al. [7]: their outcome is total factor productivity rather than gross value added, their sample is national rather than one state, and their data end in 2015-16 while this begins in 2021-22. Which matters cannot be settled here.

7. Sensitivity of the Estimates

This section varies the specification, the sample, and the measurement of both the outcome and the credit variables. Tables 7 and 8 report the results. The formal coefficient stays positive and significant throughout. The informal coefficient is never significantly positive in any specification run.

7.1 Sector Composition

A single industry could drive the result. Table 7 re-estimates the preferred specification eleven times, dropping one broad sector each time. The formal coefficient ranges from 0.129 to 0.171 and the largest p-value is 0.0003 (Figure 4), with the informal coefficient insignificant throughout.

Restricting to single sectors is more demanding. Trade gives 0.220 and manufacturing 0.232, both significant at one percent. Accommodation and food services is the exception, with a formal coefficient of 0.004 and an informal one of minus 0.149, the only significantly negative informal estimate in the paper. On 4,450 enterprises that is not a power problem.

Table 7. Dropping one broad sector at a time

Excluded sector	N	Formal	p	Informal	p
Accommodation & food	46,542	0.171	0.000	-0.002	0.972
Education	48,989	0.158	0.000	-0.019	0.709
Finance & real estate	48,861	0.160	0.000	-0.016	0.752
Health & social work	49,333	0.153	0.000	-0.026	0.594
Information & communication	50,652	0.157	0.000	-0.017	0.740
Manufacturing	37,315	0.140	0.000	-0.028	0.574
Other	50,833	0.155	0.000	-0.017	0.733
Other services	44,151	0.159	0.000	-0.008	0.872
Professional & business services	48,682	0.160	0.000	-0.019	0.711
Trade	38,537	0.129	0.000	-0.047	0.421
Transport & storage	46,025	0.169	0.000	-0.013	0.797

Note. Preferred specification re-estimated with each broad sector excluded in turn.

Source: Author's calculations from ASUSE unit-level records, 2021-22 to 2023-24, urban Maharashtra (Ministry of Statistics and Programme Implementation, 2025).

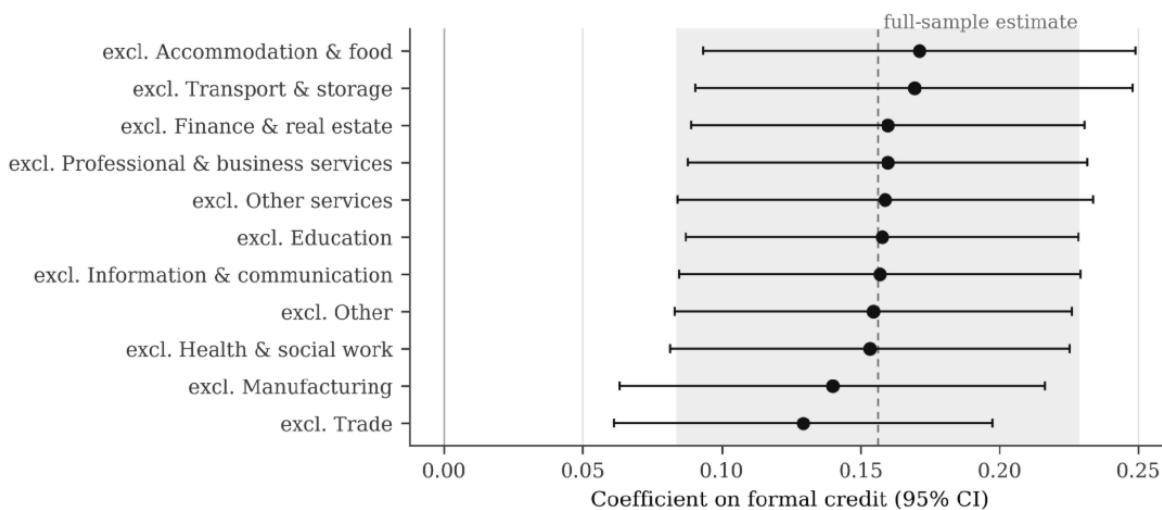
Table 8. Sensitivity checks

Check	N	Formal	p	Informal	p
Round 2021-22 only	15,363	0.099	0.044	-0.010	0.897
Round 2022-23 only	16,471	0.146	0.001	-0.115	0.100
Round 2023-24 only	19,158	0.215	0.000	0.089	0.086
Trim 1st/99th pct of log GVA	49,972	0.098	0.002	-0.063	0.090
Trade only	12,455	0.220	0.000	0.025	0.738
Manufacturing only	13,677	0.232	0.000	-0.015	0.842
Accommodation & food only	4,450	0.004	0.931	-0.149	0.008
Other services only	6,841	0.105	0.049	-0.104	0.147
Own-account enterprises only	37,792	0.144	0.001	0.002	0.957
Establishments only	13,200	0.160	0.000	-0.037	0.672

Note. Preferred specification re-estimated on the stated sample or outcome.

Source: Author's calculations from ASUSE unit-level records, 2021-22 to 2023-24, urban Maharashtra (Ministry of Statistics and Programme Implementation, 2025).

Figure 4. The formal credit coefficient when each broad sector is dropped in turn



Note. The shaded band is the 95 percent confidence interval of the full-sample estimate.

Source: Author's calculations from ASUSE unit-level records, 2021-22 to 2023-24, urban Maharashtra (Ministry of Statistics and Programme Implementation, 2025).

7.2 Time, outliers and enterprise type

Estimating each round separately gives formal coefficients of 0.099, 0.146 and 0.215 across the three years, significant in all three and rising, with the informal coefficient insignificant throughout. Three points cannot support a trend reading. Trimming the first and ninety-ninth percentiles reduces the formal coefficient to 0.098, still significant at one percent, so the result is not produced by a few very large enterprises. Splitting by enterprise type gives 0.144 for own-account enterprises and 0.160 for establishments, so informal finance shows no association for either, against what Degryse et al. [10] predict.

7.3 Alternative measures

Replacing the binary indicators with the logarithm of one plus the outstanding amount gives 0.016 for formal credit and 0.001 for informal, so the asymmetry holds on the intensive margin too. Using gross value added per worker as the outcome gives 0.126 and minus 0.028.

7.4 Narrower subgroups

Table 9 estimates the preferred specification on subgroups defined by premises type, the closest ASUSE proxy for street vending. Among enterprises with no fixed premises the formal coefficient falls to 0.096. Among trade enterprises with no fixed premises it rises to 0.350, about 42 per cent, on 968 observations of which 36 hold formal credit. The two are reported together and both are provisional.

Table 9. Preferred specification on premises-based subgroups

Subgroup	N	Formal	p	Informal	p
All urban Maharashtra	50,992	+0.156	0.000	-0.015	0.767
Fixed premises	44,479	+0.167	0.000	-0.023	0.678
No fixed premises	6,513	+0.096	0.064	-0.009	0.911
Trade and no fixed premises	968	+0.350	0.000	+0.116	0.309

Note. Standard errors clustered by district.

Source: Author's calculations from ASUSE unit-level records, 2021-22 to 2023-24, urban Maharashtra (Ministry of Statistics and Programme Implementation, 2025).

7.5 What these checks do not address

None of these checks touches the identification problem in Section 5.2. They establish that the association is not an artefact of sector composition, outliers, a single round, or the choice of

performance measure. They do not establish the direction of causation, and they do not test whether ASUSE records the form informal credit actually takes.

8. Field Evidence on Informal Credit Mechanisms

8.1 Why a second instrument

Section 7 rearranges one dataset. Every check holds the instrument fixed, so none of them can ask whether it sees what it needs to see. ASUSE records credit as an amount outstanding on the reference date, so borrowing that leaves no outstanding amount leaves no trace. That is the gap this section tests. Eighteen enterprises could not support re-estimating the regression, so the survey asks a narrower question instead. What does informal credit look like inside these enterprises, and is the ASUSE instrument built to see it.

8.2 Design and frame

I surveyed 18 enterprises across two market areas in Mumbai on 12 and 13 September 2026 (Table 10). The frame was unincorporated retail and prepared-food enterprises trading from fixed or mobile pitches. Registration status and worker count were not used to restrict selection, which preserves the own-account and establishment distinction ASUSE uses.

Selection was purposive. Enterprises were approached in sequence and those willing were interviewed, with consent recorded first. The instrument ran to 21 closed questions and used bands rather than exact rupee figures, since a vendor will rarely give a precise turnover to a stranger.

Two features limit what follows. The sample is not representative of urban Maharashtra or of market vendors, and no figure below estimates a population quantity. The reference periods also differ. ASUSE asks what is owed on a fixed date, while the survey asks about ever applying and about borrowing in the last year.

Table 10. Survey sample composition and credit status

Characteristic	Count	Share
Enterprises surveyed	18	100%
Operates alone, no other worker	7	39%
At least one other person working	11	61%
Holds GST or Udyam registration	2	11%
Holds a bank account in own name	16	89%

Characteristic	Count	Share
Holds an approved formal loan	5	28%
Applied for a formal loan at any time	7	39%
Borrowed informally in the last year	14	78%
Holds both formal and informal credit	3	17%
Holds neither	2	11%

Note. 18 enterprises. The sample is purposive and not representative of urban Maharashtra or of market vendors.
Source: Author's survey of 18 market enterprises, two market areas in Mumbai, 12 and 13 September 2026.

Thirteen of the eighteen sell fruit and vegetables, three tea and breakfast food, and two flowers. The closest ASUSE subgroup, trade enterprises with no fixed premises, runs at 3.7 per cent formal and 6.9 per cent informal, against 28 and 78 per cent in the survey.

8.3 Supplier credit and a price that leaves no record

Of the fourteen informal borrowers, eleven buy stock on supplier credit, four borrow from a moneylender and three from family (Table 11). Those overlap, since four of the fourteen use more than one source. The moneylender is the figure the informality literature reaches for. Here he is a minority channel, and five of the fourteen fund at least half their working capital this way.

Ten of those eleven report paying more for goods bought on credit than in cash. That functions as interest, charged inside the price of the stock, so there is no principal, no stated rate and no amount outstanding on any date. A survey that measures credit as a debt has nothing to write down.

Table 11. Informal credit sources, pricing and dependence

Measure	Count	Share
Informal borrowers	14	78% of 18
Uses supplier credit	11	79% of 14
Uses a moneylender	4	29% of 14
Borrows from family	3	21% of 14
Pays more on credit than cash	12	86% of 14
Pays more, among supplier users	10	91% of 11
Funds under 25% of working capital	4	29% of 14
Funds 25 to 50%	5	36% of 14
Funds 50 to 75%	4	29% of 14

Measure	Count	Share
Funds over 75%	1	7% of 14

Note. Sources are not mutually exclusive. Shares are of the 14 informal borrowers unless stated otherwise.
Source: Author's survey of 18 market enterprises, two market areas in Mumbai, 12 and 13 September 2026.

The size of the gap reads straight off ASUSE. Across the 53,002 urban Maharashtra enterprises, 0.68 per cent report an amount outstanding to a supplier or contractor. Here 61 per cent carry supplier credit. Sampling does not produce a difference between 0.68 and 61. ASUSE counts supplier credit only when it takes the form of a debt, and the form it takes here is a markup.

This bears on Section 6 and not only on description. The informal coefficient is minus 0.018 and insignificant. That now admits a second reading. The ASUSE variable may be missing the channel most of these enterprises use, which would leave the coefficient estimated on the wrong quantity. The distinction worth holding on to is between imprecision and undermeasurement. A noisy measure of informal credit would widen the standard error and leave the coefficient roughly where it belongs. A measure that omits the dominant channel altogether pushes the coefficient toward zero by recording borrowers as non-borrowers, and no amount of additional ASUSE data would fix that.

8.4 Borrowing that stops before the application

Sixteen of the eighteen hold a bank account, eleven of those have no approved loan, and nine of the eleven have never applied. Reaching a bank does not appear to be the binding constraint. Twelve of the fourteen informal borrowers would move to a bank if approval were easier, so informal credit here looks less like a preference than like what is left.

Table 12. Stated reason for not holding a formal loan

Main reason for no formal loan	Count	Type
No documents or paperwork	3	Screening
No collateral	3	Screening
Did not think I would qualify	2	Screening
Did not know how to apply	2	Screening
Interest rate too high	2	Price
Did not need it	1	No demand

Note. The 13 enterprises without a formal loan. One reason recorded per respondent.
Source: Author's survey of 18 market enterprises, two market areas in Mumbai, 12 and 13 September 2026.

Ten of the thirteen name a screening barrier and three a price or a lack of need (Table 12). Rationing as Stiglitz and Weiss [2] set it out happens at the lender. What the survey records is rationing that has moved upstream into the borrower. The enterprise screens itself out, and the refusal is never recorded because the application is never made.

One respondent complicates that. A registered stall with hired staff holds an active bank loan of one lakh, still buys stock on supplier credit, still pays the premium, and would not prefer a bank. The reason was speed. A cheaper loan that takes a week to arrange is no substitute for credit that settles at the mandi the same morning.

8.5 The Size Gradient

One quantity can be compared across the two datasets, and only in direction (Table 13). Formal credit rises with enterprise size in both.

Table 13. Formal credit incidence by enterprise type

Enterprise type	Survey	ASUSE
Operates alone (own-account)	1 of 7, 14%	3.96%
Has hired workers (establishment)	4 of 11, 36%	7.06%
Ratio, larger to smaller	2.5	1.8

Note. ASUSE column covers 53,002 urban Maharashtra enterprises pooled across three rounds. A Fisher exact test on the survey gradient returns $p = 0.60$.

Source: Survey column: author's survey, Mumbai, 12 and 13 September 2026. ASUSE column: author's calculations from ASUSE unit-level records, 2021-22 to 2023-24.

The levels are far apart for the reasons in Section 8.2, and the survey column is not an estimate of anything. The direction agrees and the ratio is of a similar order, but a Fisher exact test on the survey gradient returns a p -value of 0.60. Eighteen observations cannot establish this relationship. The survey fails to contradict the gradient in the secondary data, which is all this design supports.

8.6 What this section cannot do

The survey is small, purposive and carried out on two mornings. Answers are self-reported, and questions about moneylenders invite understatement, so any bias in the informal figures runs downward, which would widen the gap in Section 8.3 rather than narrow it. The premium question is binary. Respondents report that stock bought on credit costs more, not how much more. Without a magnitude there is no implied interest rate and no comparison against formal lending rates.

9. Evaluation and Conclusion

9.1 What the paper finds

The question was whether formal and informal credit are associated with the gross value added of unincorporated enterprises in urban Maharashtra, and whether the two differ. They do. Formal credit carries a coefficient of 0.156 on log gross value added, around 17 percent. Informal credit carries minus 0.018, indistinguishable from zero, and the restriction that the two coefficients are equal is rejected with a p-value of 0.00002.

That gap is why the two were kept apart rather than combined into an access index, which would have returned one positive number and hidden the fact that a component does nothing. Predictions 1 and 3 in Section 4 are supported. Prediction 2 expected a smaller positive association for informal credit, and the data show none.

9.2 Two readings of the informal result

The informal null reads two ways and this paper cannot settle between them. The first is that informal credit does not raise value added. Loans from moneylenders, suppliers and relatives are small, short and often tied to stock, financing a purchase rather than an expansion. On that reading the coefficient measures something real.

The second is that the coefficient is estimated on the wrong variable. The dominant informal channel among the vendors surveyed is supplier credit priced as a markup, and ten of the eleven users pay it. Credit in that form has no amount outstanding, so ASUSE records nothing. The instrument reports supplier debt for 0.68 percent of enterprises while 61 percent of the survey sample carries it. On that reading ASUSE does not measure informal credit badly so much as miss most of it, and a variable that misses most of what it names will tend toward a null whatever the underlying relationship.

Two things have to be said about that. It rests on eighteen enterprises from two markets, so it cannot establish that the ASUSE variable is mismeasured across all 53,002 observations. And even if it is, the hidden credit need not have shown a positive coefficient, so the null could be right for a reason this paper does not give. What the survey does establish is that an invisible form of informal credit exists in part of this population. That is the reason to hold the null loosely rather than discard it.

9.3 What follows for policy

The survey points at a specific constraint. Sixteen of the eighteen hold a bank account, eleven of those have no approved loan, and nine have never applied. Of the thirteen without one, ten name

a screening barrier, two a price and one no need. The binding constraint appears to sit before the application, not at the interest rate.

If that generalises, it changes what an effective intervention looks like. Lowering the cost of applying, through documentation support or doorstep enrolment, targets the barrier these vendors describe. An interest subsidy does not, because the people it would help are not applying.

One caution travels with all of this. Section 5.2 gives two reasons why 0.156 is an upper bound: enterprises already doing well are more likely to be lent to, and unobserved ability raises both credit access and performance. A policy extending formal credit should not be expected to deliver 17 percent.

9.4 Limitations

The design is cross-sectional. ASUSE has not released a panel, so the same enterprise cannot be followed before and after it borrows. Credit is measured as a stock on a single date, and the sample is one state and the urban sector only. The survey is smaller still, with its limits in Section 8.6. The most consequential is that the premium question is binary, so there is no magnitude and no way to compare the cost of supplier credit against a bank rate.

9.5 Conclusion

Almost no unincorporated enterprise in urban Maharashtra borrows. Across three rounds of ASUSE, 92.4 percent hold no outstanding loan of any kind. Of the few that do, the ones borrowing from institutions are associated with gross value added about 17 percent higher than otherwise comparable enterprises, and the ones borrowing informally are associated with nothing. The difference between the two coefficients is rejected as zero at a p-value of 0.00002, and the asymmetry survives every specification in Section 7. That is the main result, and it holds whether credit is measured on the extensive or the intensive margin.

What the field evidence adds is care about what the second half of that result means. The informal credit these enterprises actually use is often not a loan at all. It is a price, charged inside the cost of the stock, with no principal and no balance owed on any date. A survey built to record debts will not find it. So a coefficient estimated on what ASUSE did record may be answering a narrower question than it appears to, and the honest reading of the informal null is that it is either a real absence of effect or an artefact of the instrument. Eighteen vendors cannot tell those apart.

That has a bearing beyond this paper. The literature disagrees about whether informal finance helps small firms, with Ayyagari et al. [9] finding no advantage and Posti et al. [7] finding one, and both sides measure informal credit as an amount owed. If a substantial share of informal

borrowing is priced rather than lent, part of that disagreement may be about measurement rather than about firms. Testing that needs only one more question on an instrument like this one, asking how much more credit-bought stock costs, which would turn a yes into an implied interest rate and let informal credit be priced against a bank rate for the first time. Measuring that price is the next thing worth doing.

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