

Who Receives Ghana's Bank Credit?

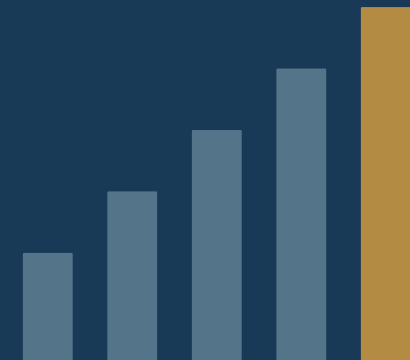
Sectoral Allocation and Enterprise Access

Sector allocation. Real growth. Enterprise access.

Agriculture • Manufacturing • Construction • Commerce • Services

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RESEARCH BRIEFING | PUBLICATION EDITION | SEPTEMBER 2026



EVIDENCE CUT-OFF
20 SEPTEMBER 2026

Credit stocks: June 2024–June 2026
Access survey: 2023 fieldwork cycle

Read allocation, growth and access as three connected questions

A sector's share of outstanding credit is not the probability that one of its enterprises can borrow.

01 SECTOR ALLOCATION

Where are the balances?

Compare five requested activity groups within the full private-credit denominator. Retain the other six groups.

Allocation and growth | pp. 6–27

02 REAL CREDIT GROWTH

What changed in purchasing power?

Separate nominal changes, CPI deflation, contributions to aggregate growth and currency valuation.

Real growth: pp. 14–19 | Flows: pp. 28–31

03 ENTERPRISE ACCESS

Which firms can obtain finance?

Compare sector allocation with establishment access. Test sensitivity and review separately identified experimental evidence.

Enterprise access and use | pp. 32–49

[Publication 3](#) | [Findings 4–5](#) | [Empirical / causal annex 50–69](#) | [Technical definitions 70–76](#) | [References 77–80](#) | [Synthesis 81](#)

Publication note and abstract

Reproducible stock diagnostics, assumption-based sensitivity and separately attributed experimental evidence.

Abstract

In June 2026, the five focus groups held 77.4% of private credit. All five grew after CPI deflation over the year, but three lost share. Balances do not measure new disbursements or enterprise reach.

Across the two June-to-June comparisons, real aggregate growth accelerated by 38.55 percentage points. Exact accounting assigns 29.81 points to nominal-growth change and 8.73 to the deflator change. Components are rounded independently; these are not causal policy effects.

The report separates concentration and sector-mix accounting from assumed price, currency and missingness scenarios. Historical Ghana grant and insurance experiments provide separately attributed evidence, not estimates of current bank-credit effects.

Publication and data availability

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Evidence cut-off: 20 September 2026
Stocks: end-June 2024, 2025 and 2026
Fieldwork: Feb 2023–Feb 2024

Data and code: supplied with this report in the companion ZIP. Source IDs link to the bibliography.

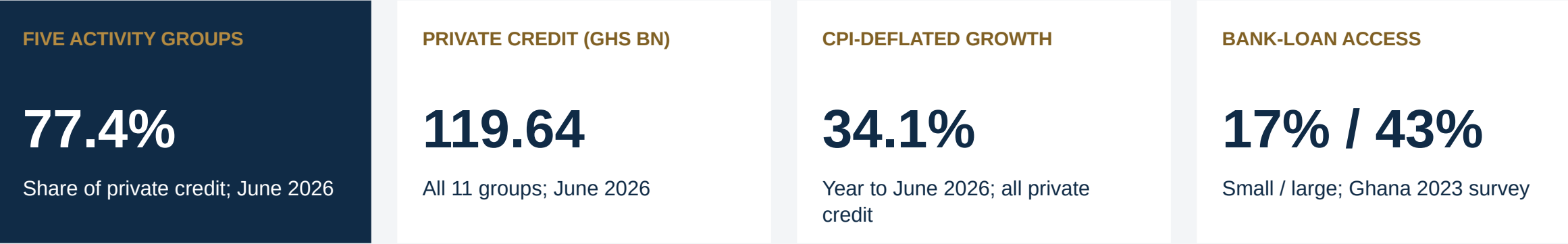
Independent IDER publication; external peer review and institutional certification are not claimed.

Suggested citation: Essilfie, Felix Larry. 2026. Who Receives Ghana's Bank Credit? Sectoral Allocation and Enterprise Access. IDER's Ghana Macroeconomic Policy and Business Intelligence Briefings. Accra: IDER.

Sources: BoG July 2026, retained inputs; World Bank Ghana 2023 profile. [S01](#), [S02](#).

Large sector balances and broad enterprise access are different findings

Each headline retains its own denominator and observation window.



The distribution changed even where every focus-sector balance grew

Agriculture, manufacturing and services lost private-credit share in the year to June 2026; their nominal balances still increased. In the bank survey, SME standards remained tightened while the overall corporate stance eased.

Bank stocks do not reveal the number of firms served, their new drawdowns or their approval probabilities.

Answer the research question at the level supported by the evidence

Amount, growth, fresh lending and enterprise access are four different outcomes.

Table 1. Research questions, outputs and limits

Research question	Evidence delivered	What is not identified
Which activities hold credit?	Same-vintage balances and private-credit shares for all 11 groups	Unique enterprises or pure SME allocation
Did credit grow in real terms?	Exact CPI-deflated growth for two annual windows	Constant-currency or sector-input-volume growth
How much fresh credit was paid out?	Stock–flow framework and explicit illustrative counterexamples	Sectoral gross new disbursements
Can enterprises access loans?	Dated firm-size indicators and June 2026 lending-standards narrative	Current sector-by-size approval and drawdown rates

Sources: BoG July 2026, retained inputs; World Bank Ghana 2023 profile; World Bank indicator definitions. [S01](#), [S02](#), [S04](#).

Use a single source vintage for the sector comparison

Three end-June snapshots permit two matched annual comparisons—not a monthly credit panel.

Table 2. Input windows and evidence status

Dataset	Period / population	Verification and treatment
Private credit by activity	June 2024, 2025, 2026; 11 source groups	Retained A.5 transcription; arithmetic replayed
Headline CPI	June 2025: 13.67%; June 2026: 5.30%	Prior A.2 input retained; exact deflation replayed
Industry NPL ratios	June 2025 and June 2026; broader credit universe	Prior industry inputs retained; separate from A.5
Credit-conditions survey	June 2026 bank-reported lending standards	Section 6.4 text; qualitative, not approval rates
Enterprise access	713 firms; interviews Feb 2023–Feb 2024	Published figures rechecked; no microdata estimation

BoG inputs are retained: renewed primary retrieval failed. World Bank finance page images were rechecked.

The requested sector labels require a transparent crosswalk

The report preserves the Bank of Ghana’s labels instead of silently changing their scope.

Table 3. Sector mapping used in the report

Requested focus	BoG Table A.5 measure used	Boundary to retain
Agriculture	Agriculture, forestry & fishing	Not the entire food / agribusiness value chain
Manufacturing	Manufacturing	Processing may differ from farming and trading
Construction	Construction	Not automatically all mortgages or real estate
Commerce	Commerce & finance; trade rows shown separately	Finance cannot be removed from this aggregate
Services	Services as reported in the activity table	Not all service-producing activities in GDP

Sources: BoG July 2026, retained inputs; UN ISIC Rev.4. [S01](#), [S07](#).

Do not splice activity, borrower-type and industry-credit denominators

An activity-coded private stock is not identical to a corporate-only loan book.

Activity allocation

A.5: private-sector credit by reported activity. The five groups are a subset of 11; the remaining groups stay in the denominator.

Borrower identity

Enterprise, household and public/private status require an institutional classification. A sector label does not count firms or establish SME status.

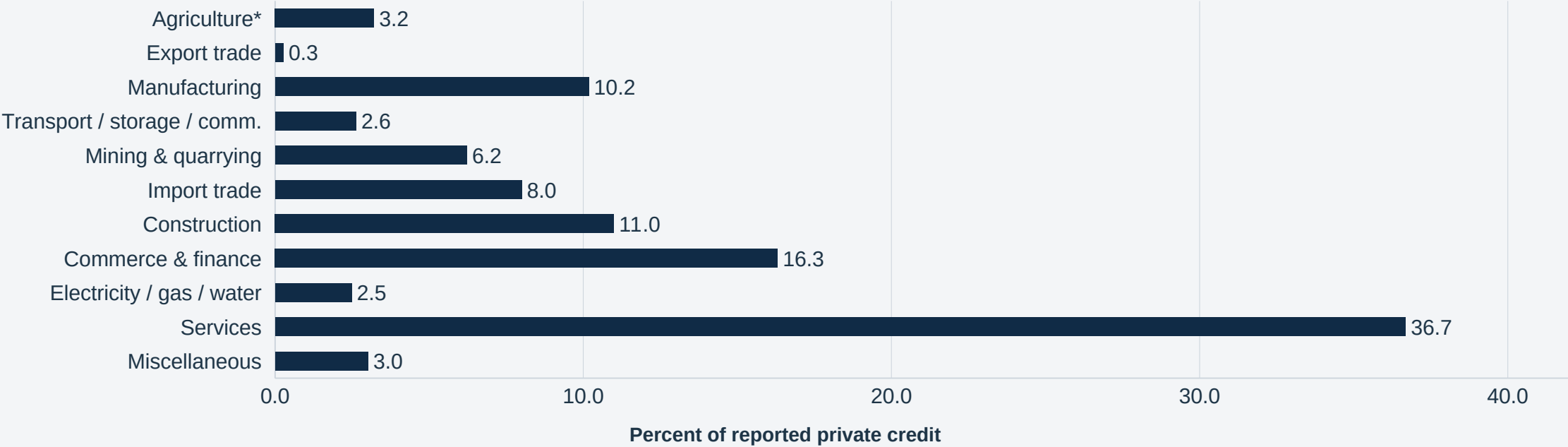
Prudential risk

Industry NPL ratios have their own loan denominators. They cannot be multiplied by the private activity stocks to manufacture performing credit.

The full private-credit denominator contains eleven activity groups

End-June 2026 shares of reported private credit; percentages.

Figure 1. Private-sector outstanding credit by activity, June 2026



Private-sector activity classification; agriculture includes forestry and fishing; commerce includes finance.

The five-sector comparison uses balances, not loan origination flows

Outstanding private-sector credit, GHS billion; end-June observations.

Table 4. Outstanding balances in the requested groups

Activity group	June 2024	June 2025	June 2026	2026 private share
Agriculture*	3.05	3.51	3.84	3.2%
Manufacturing	8.99	9.41	12.18	10.2%
Construction	7.41	7.48	13.15	11.0%
Commerce & finance	11.51	13.21	19.51	16.3%
Services	24.89	31.81	43.89	36.7%

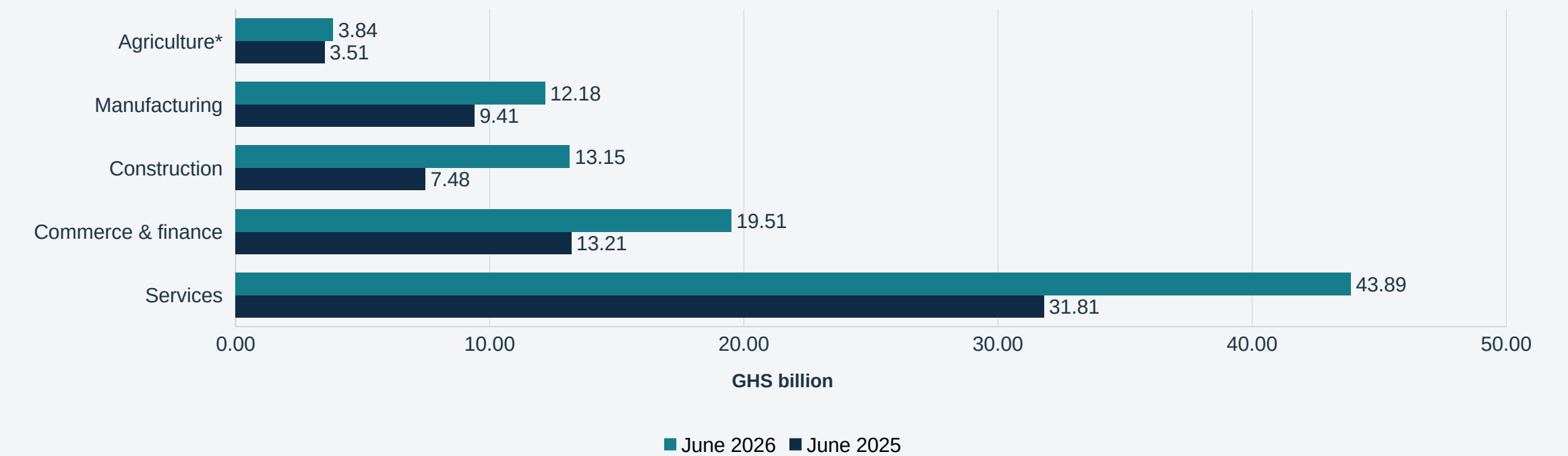
The full 11-group totals, not the five-group subtotal, are used for allocation shares.

Sources: BoG July 2026, retained inputs. [S01](#).

Services held the largest balance among the five focus groups

Private activity balances, GHS billion, June 2025 and June 2026.

Figure 2. Five-sector outstanding credit comparison

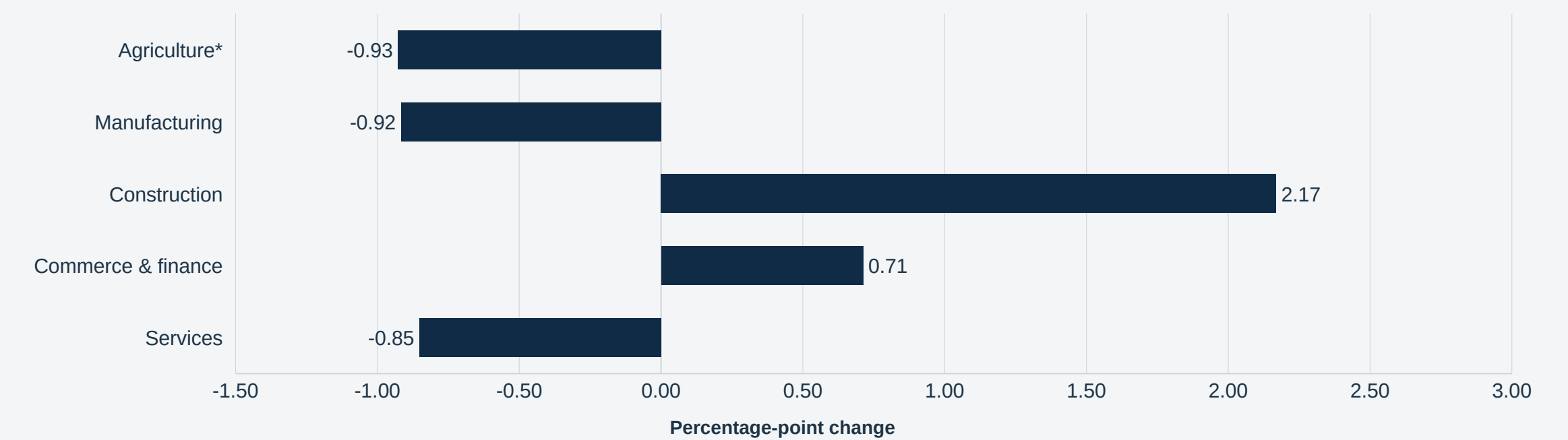


Private-sector activity classification; agriculture includes forestry and fishing; commerce includes finance.

Construction and commerce gained share; three groups lost share

Changes in share of total private credit, June 2025 to June 2026; percentage points.

Figure 3. Change in allocation shares within private credit



Negative share changes are not negative credit balances, and they do not quantify financing shortfalls.

A declining share can coexist with nominal and real credit growth

Agriculture and manufacturing illustrate why the denominator matters.

Table 5. Stock growth versus share change

Measure	Agriculture, forestry & fishing	Manufacturing
Nominal outstanding-credit growth	+9.5%	+29.5%
CPI-deflated growth	+4.0%	+23.0%
Private-credit share: June 2025 → June 2026	4.1% → 3.2%	11.1% → 10.2%
Interpretation	Grew more slowly than the private total	Grew more slowly than the private total

A constant-share counterfactual is an accounting benchmark—not a causal or normative estimate of unmet demand.

Private credit grew in real terms in 2026 after shrinking in 2025

Matched year-on-year comparisons to end-June; CPI purchasing-power adjustment.

Table 6. Growth of the full private-credit stock

Matched annual window	Nominal growth	Headline CPI	Exact CPI-deflated growth
June 2024 → June 2025	8.6%	13.67%	-4.49%
June 2025 → June 2026	41.2%	5.30%	34.06%

Real growth = 100 × [(1 + nominal growth / 100) / (1 + CPI inflation / 100) – 1]

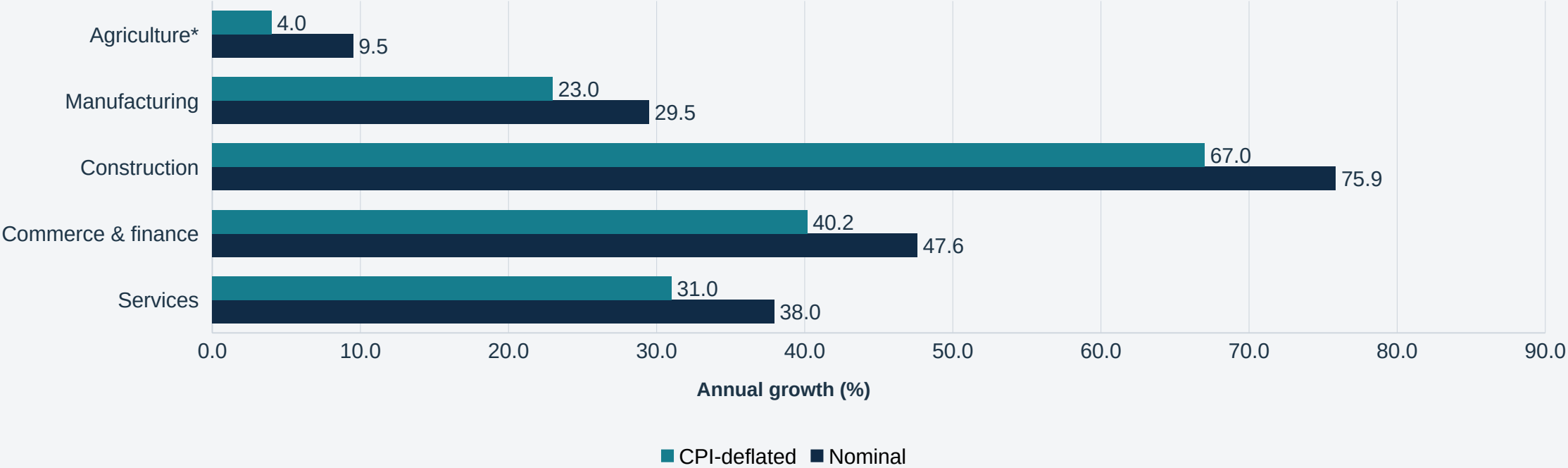
Subtracting inflation from nominal growth is an approximation; the report uses the ratio formula throughout.

CPI deflation is not a constant-currency adjustment. The 34.12% source entry is separately flagged in the exception ledger.

All five focus groups expanded after CPI deflation in 2026

Year to June 2026; percentage growth, using a common 5.30% headline CPI change.

Figure 4. Nominal and real outstanding-credit growth, year to June 2026

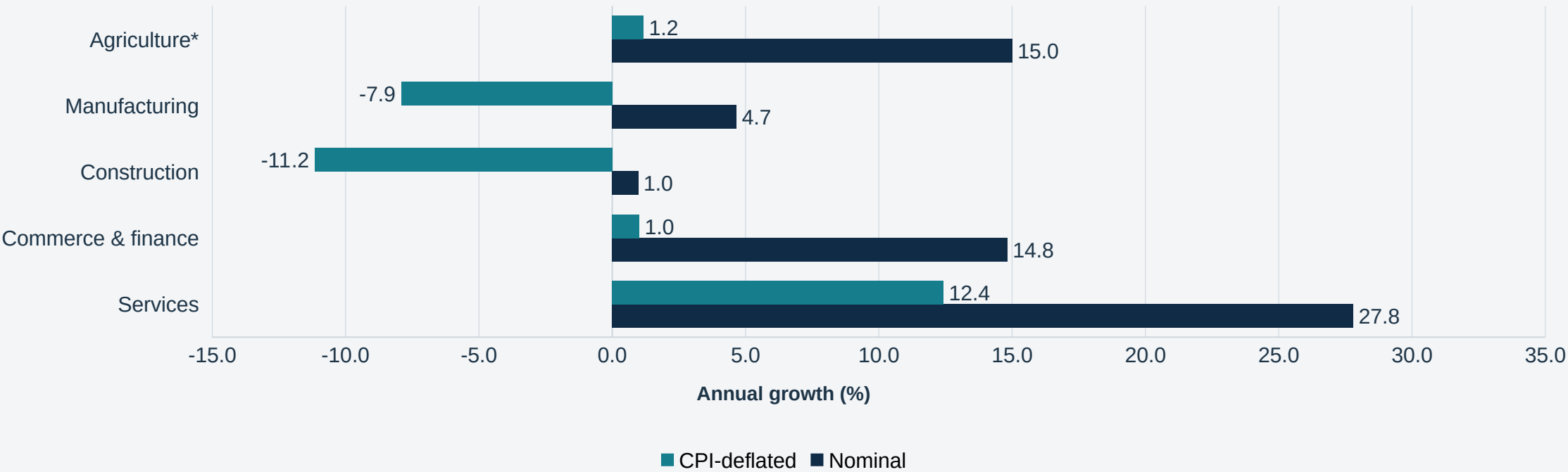


Private-sector activity classification; agriculture includes forestry and fishing; commerce includes finance.

Manufacturing and construction had real contractions a year earlier

Year to June 2025; percentage growth, using 13.67% headline CPI inflation.

Figure 5. Nominal and real outstanding-credit growth, year to June 2025

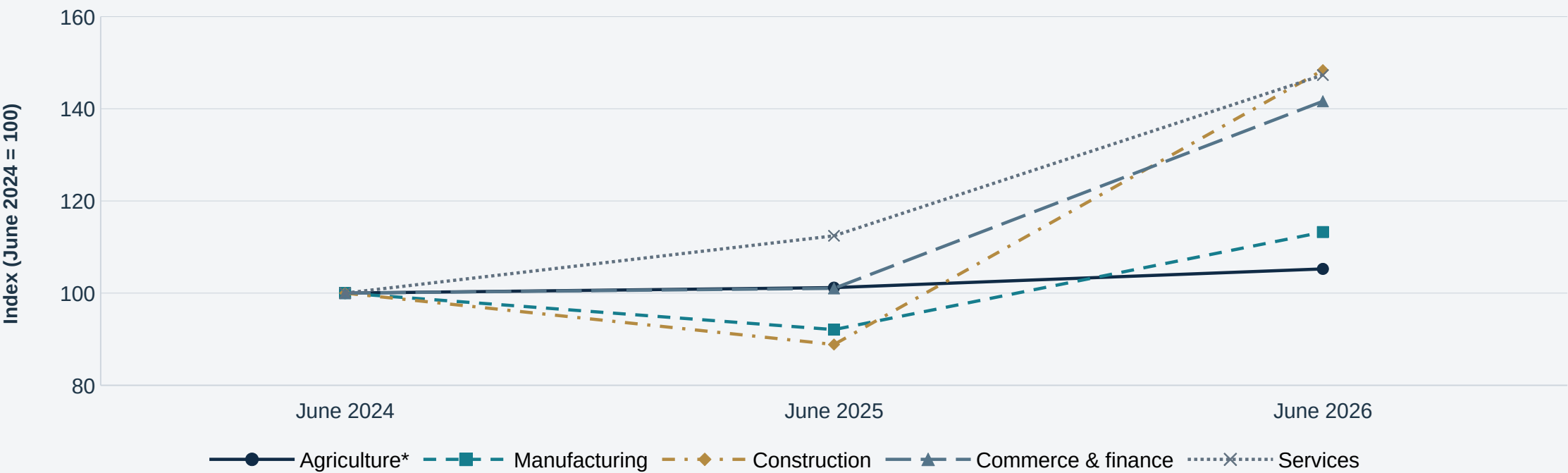


Negative CPI-deflated growth is retained on the signed axis; no intervening monthly path is imputed.

The two-year real comparison preserves the intermediate observation

Constant-purchasing-power outstanding-credit index; June 2024 = 100. Three June observations only.

Figure 6. Real credit index across the five focus activities

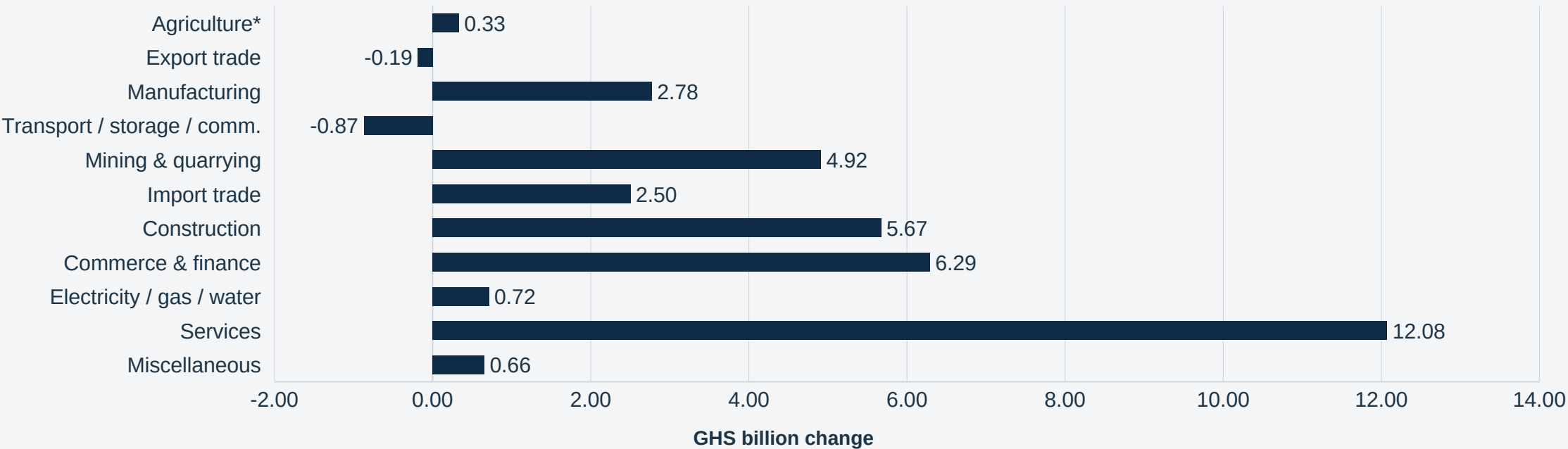


Lines connect only three annual snapshots; there is no estimated monthly path or forecast.

Services, commerce and construction explain 68.9% of the stock increase

Contributions to the GHS34.89 billion rise in total private outstanding credit, year to June 2026.

Figure 7. Activity contributions to the annual change in private credit



Negative bars represent declining balances. The increase is not a measured gross loan-disbursement total.

An amount, a contribution and a growth rate use different denominators

Year to June 2026; the full private stock grew 41.17%.

Table 7. Growth-contribution reconciliation

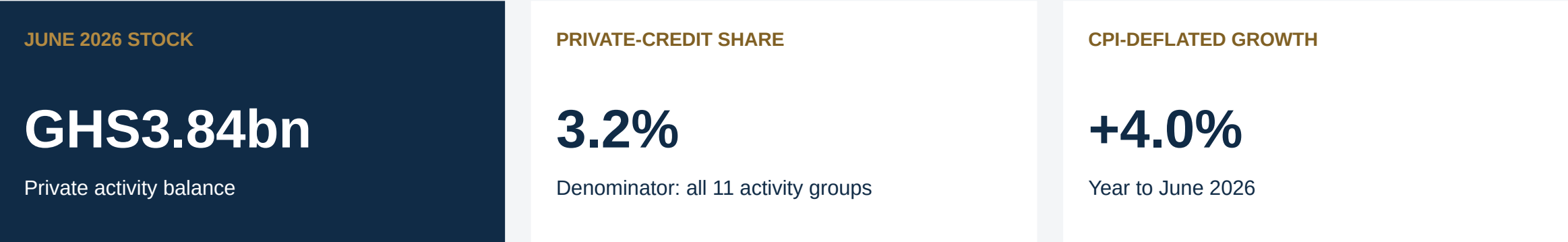
Activity	Stock increase (GHS bn)	Contribution to total growth (pp)	Share of stock increase (%)
Agriculture*	0.33	0.39	1.0
Manufacturing	2.78	3.28	8.0
Construction	5.67	6.69	16.3
Commerce & finance	6.29	7.42	18.0
Services	12.08	14.25	34.6
Other six activity groups	7.74	9.13	22.2

Contributions reconcile to the total within source rounding. None is a causal allocation effect.

Sources: BoG July 2026, retained inputs. [S01](#).

Agriculture: a growing balance, but a smaller private-credit share

The reported category includes forestry and fishing, not all agrifood financing.



Observed allocation

The balance increased, but more slowly than total private credit. Its share fell from 4.1% to 3.2%.

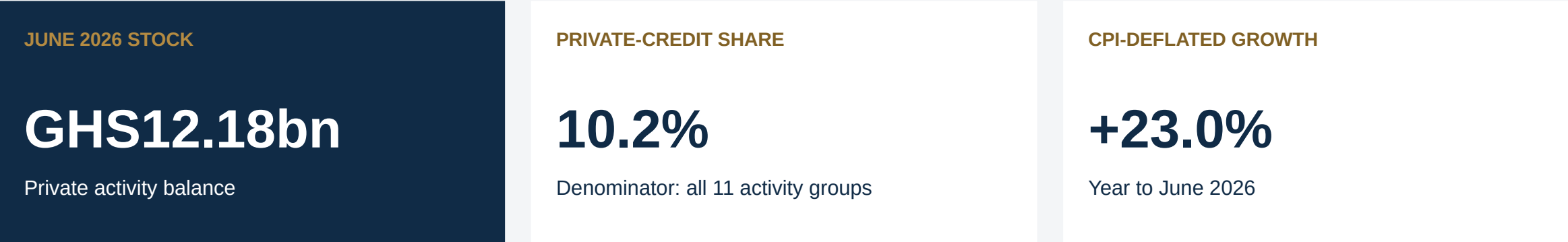
What the next inquiry needs

Separate production, forestry, fishing and linked processors; identify seasonal drawdowns, repeat borrowers, repayment cycles and the coverage of non-bank finance.

Business-intelligence questions are proposed inquiries, not estimated explanations of the observed sector outcome.

Manufacturing: real credit recovered after the prior annual decline

Separate working-capital facilities from machinery and long-term investment loans.



Observed allocation

Nominal growth accelerated to 29.5%; CPI-deflated growth reached 23.0%. The private-credit share still declined.

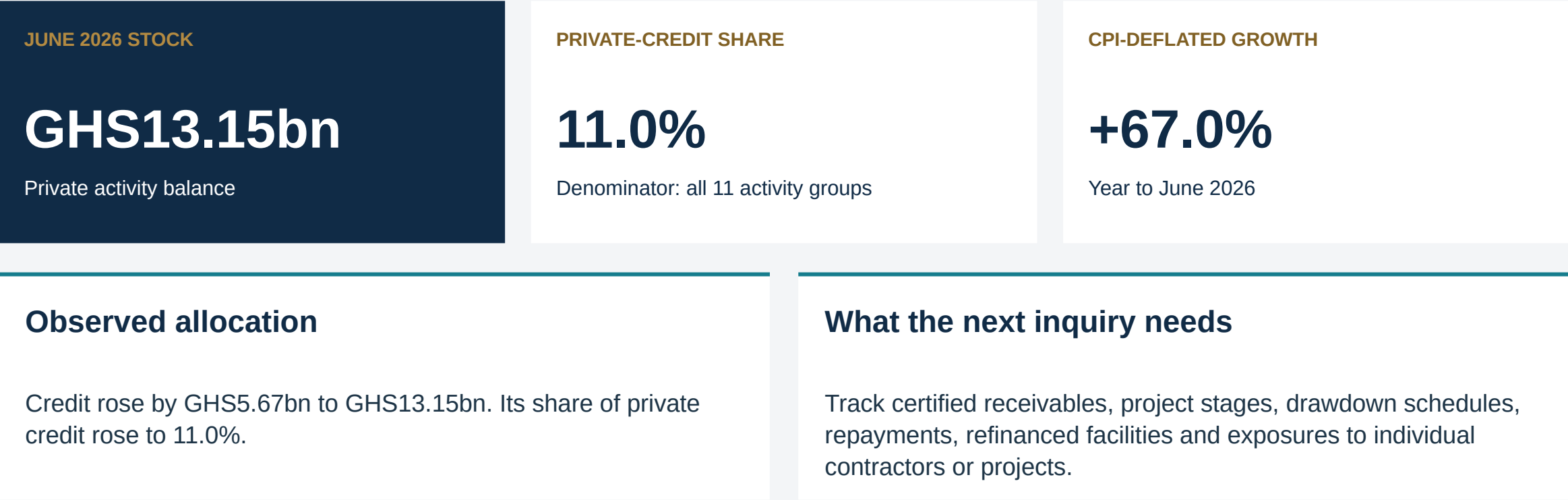
What the next inquiry needs

Match processing subsectors, imported-input exposure, equipment finance, tenor, grace periods, currency and plant-level investment. Do not equate a larger stock with more machinery purchases.

Business-intelligence questions are proposed inquiries, not estimated explanations of the observed sector outcome.

Construction: the balance rose sharply in the latest annual window

Project finance, contractor working capital and refinancing must be distinguished.

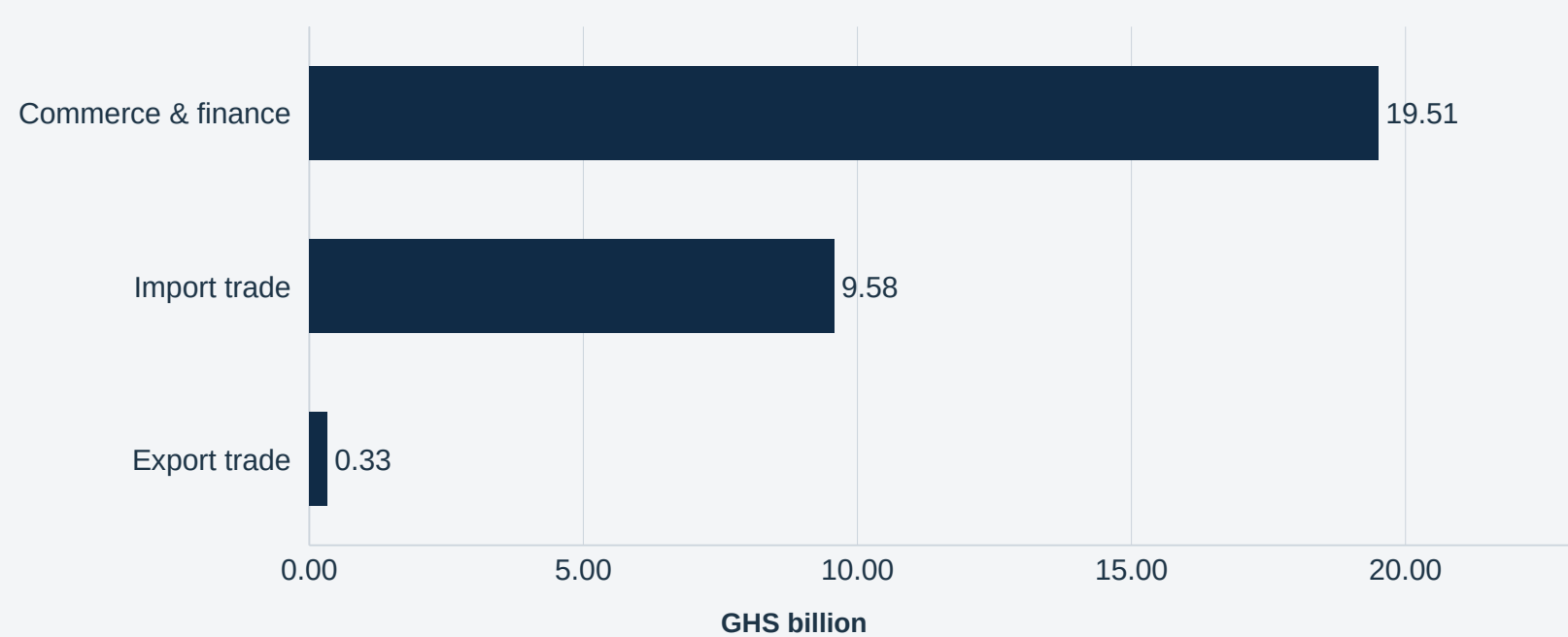


Business-intelligence questions are proposed inquiries, not estimated explanations of the observed sector outcome.

Commerce is broader than one row—and the finance component matters

End-June 2026 outstanding balances; GHS billion. Source activity categories are kept distinct.

Figure 8. Commerce and the separately reported trade categories



Two transparent scopes

Commerce & finance alone:
16.3% of private credit

With import and export trade:
24.6% (derived grouping)

Neither is pure
retail/wholesale trade.

The derived grouping includes finance; no finance-only subtraction or GDP-sector mapping is invented.

Services: a larger balance, with a slightly smaller allocation share

The bank's services bucket is not the whole services economy.

JUNE 2026 STOCK

GHS43.89bn

BoG services activity category

PRIVATE-CREDIT SHARE

36.7%

Down 0.85 pp over the year

CPI-DEFLATED GROWTH

+31.0%

Year to June 2026

Observed scale

Services generated GHS12.08bn of the GHS34.89bn private-stock increase. This is an amount, not a borrower count.

What the next inquiry needs

Disaggregate the services bucket, separate enterprise from household records, and measure borrower concentration, loan purpose and tenor.

A large aggregate can contain concentrated exposures; the number and distribution of beneficiary firms are not observed.

A joint reading avoids mistaking growth for access or portfolio quality

Same comparison window: June 2025–June 2026.

Table 8. Three outcome dimensions and data needs

Activity	Nominal growth (%)	CPI-deflated (%)	Share change (pp)	Next measurement
Agriculture*	9.5	4.0	−0.93	Seasonal drawdowns
Manufacturing	29.5	23.0	−0.92	Purpose and tenor
Construction	75.9	67.0	+2.17	Project-level utilisation
Commerce & finance	47.6	40.2	+0.71	Finance / trade split
Services	38.0	31.0	−0.85	Subsector / borrower mix

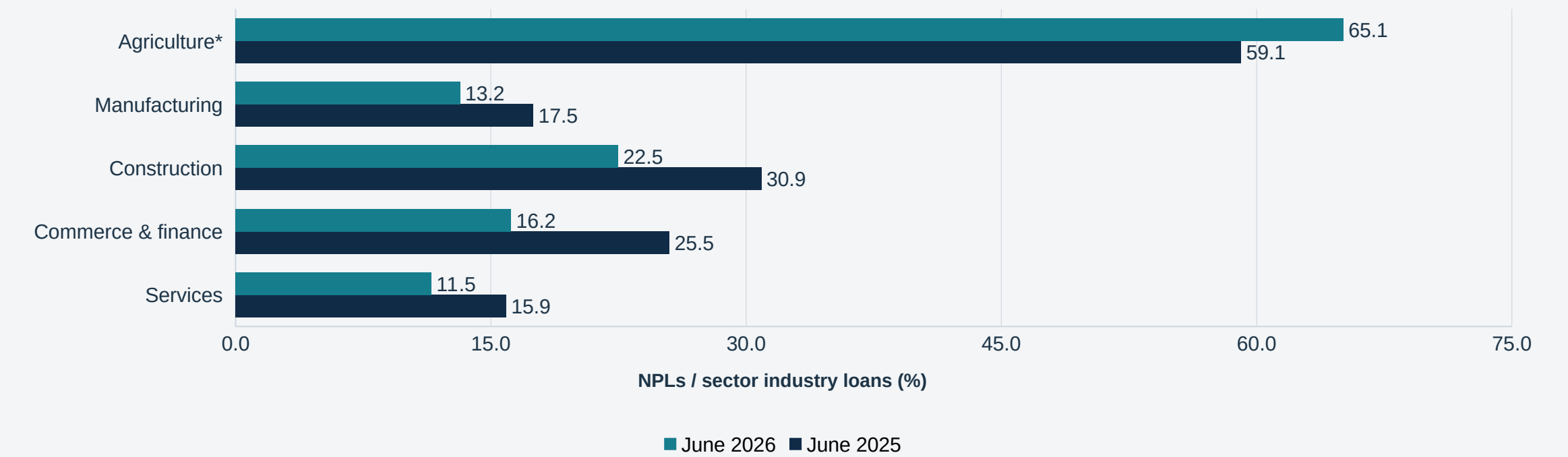
No financing-gap, optimal credit share or expected investment return is estimated from this table.

Sources: BoG July 2026, retained inputs. [S01](#).

Sector NPL ratios describe the inherited loan book, not new-loan risk

Industry NPL ratios, June 2025 and June 2026; denominator is each sector’s reported industry loans.

Figure 9. Reported NPL ratios in the five focus activity groups



Do not multiply these industry ratios by Table A.5 private stocks to infer NPL amounts or performing-sector credit.

A falling NPL ratio can reflect more than a fall in bad loans

Numerator changes, denominator growth and source coverage must be examined separately.

Table 9. Reading credit-risk ratios correctly

Diagnostic	Required comparison	Interpretation control
NPL amount	Opening impaired stock, new defaults, recoveries and write-offs	Separate changes in numerator from changes in loan stock
NPL ratio	Impaired stock / same-universe gross loan stock	Not an origination-vintage default probability
Hypothetical example	20 / 100 = 20%; unchanged 20 / 125 = 16%	Ratio falls with no decline in the impaired amount
Coverage check	Private A.5 versus industry Figure 6.1	No mixed-denominator performing-credit calculation

Sources: BoG July 2026, retained inputs. [S01](#).

Outstanding balances are the cumulative result of several flows

A closing balance does not reveal gross new disbursements.

Closing stock = Opening stock + Cash disbursements – Principal repayments

– Write-offs + FX valuation + Capitalised interest + Net transfers / reclassification

Cash lending

Record actual dated disbursements.
Approvals and unused limits are not paid-out cash.

Balance reductions

Record principal repayments and write-offs separately. Interest payments are not principal repayments.

Non-cash changes

Identify currency valuation, capitalisation and transfers under the same accounting definition.

Identical stock growth can conceal very different new lending

Hypothetical portfolios, arbitrary currency units. These are not observed Ghana transactions.

Table 10. The same closing stock with three different cash-lending paths

Flow or balance	A: lower turnover	B: higher turnover	C: valuation only
Opening gross stock	100	100	100
New cash disbursement	30	100	0
Principal repayment	20	80	0
Write-off	0	10	0
FX valuation addition	0	0	10
Closing gross stock	110	110	110

No disbursement estimate for any Ghanaian sector is inferred from these examples.

CPI deflation does not remove exchange-rate valuation effects

Hypothetical foreign-currency loan: the original-currency balance is unchanged.

ORIGINAL-CURRENCY STOCK

USD100,000

Unchanged in the illustration

CEDI / USD RATE

10 → 12

Assumed exchange-rate movement

CEDI STOCK GROWTH

20.0%

Despite zero new cash disbursement

Constant-currency stock: Σc (balance in currency $c \times$ fixed base-period exchange rate c)

Keep actual currency holdings, conversion dates and hedging arrangements. The core sector table does not supply this decomposition.

Approvals, drawdowns, renewals and net additional credit are different

An enterprise may refinance an existing balance without receiving additional total financing.

Table 11. Measurement of new financing

Event	Record as	Do not infer
Approval without payment	Approved amount / limit and decision date	Cash received or new outstanding principal
Revolving-facility drawdown	Dated gross cash disbursement	A unique new enterprise each time
Renewal of an existing limit	Renewal flag and contractual terms	New cash disbursement without a ledger entry
Refinancing across banks	New loan plus matched repayment / lender switch	Equal growth in total firm financing
New-to-credit enterprise	Verified first credit relationship across covered lenders	First loan at one bank is the firm's first ever loan

Aggregate credit growth coexisted with tightened SME standards

The Bank of Ghana’s bank survey reports direction of standards—not an enterprise approval probability.

Outstanding credit	Lending standards	Enterprise implication
Table A.5 shows 41.2% nominal private-credit growth in the year to June 2026.	BoG reports overall corporate easing, but SME standards remained tightened in the June 2026 survey round.	Do not use aggregate credit expansion as evidence that the typical SME obtained a larger, cheaper or more accessible facility.

The standards survey is not a count of approvals, a sectoral rejection rate or a causal explanation of the stock increase.

Historical enterprise access is measured in a narrower population

Ghana 2023 survey: 713 establishments; interviews February 2023–February 2024. The profile uses “firms”.

Table 12. Who is represented by the survey?

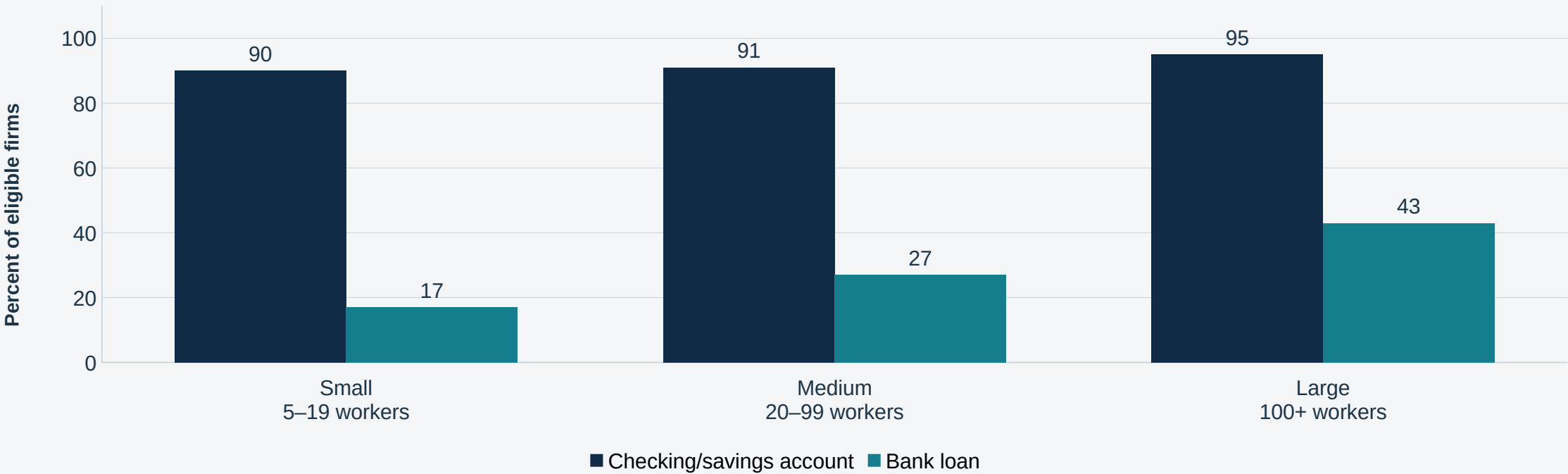
Dimension	Coverage retained	Consequence
Firm type	Registered formal private firms in eligible non-agricultural activities	Not the full Ghana enterprise population
Size	Small 5–19; medium 20–99; large 100+ workers	Firms with fewer than five employees are excluded
Time	Interviews February 2023–February 2024	Not a June 2026 access measure
Sector resolution	Published profile gives selected aggregates and size breakdowns	No complete five-sector-by-size access matrix
Statistical treatment	Published weighted estimates; no microdata re-estimation	No invented design-based confidence intervals

Sources: World Bank Ghana 2023 profile; World Bank methodology; World Bank Ghana 2023 catalogue. [S02](#), [S05](#), [S13](#).

Account use was common; bank-loan access was much less common

Published rounded percentages, Ghana 2023 profile.

Figure 10. Use of bank accounts and loans by firm size



Ghana 2023 survey; interviews February 2023–February 2024. Formal private firms with 5+ workers in covered non-agricultural activities.

Having a bank loan is not the same as using banks for investment

Different questions produce different percentages—even within the same firm population.

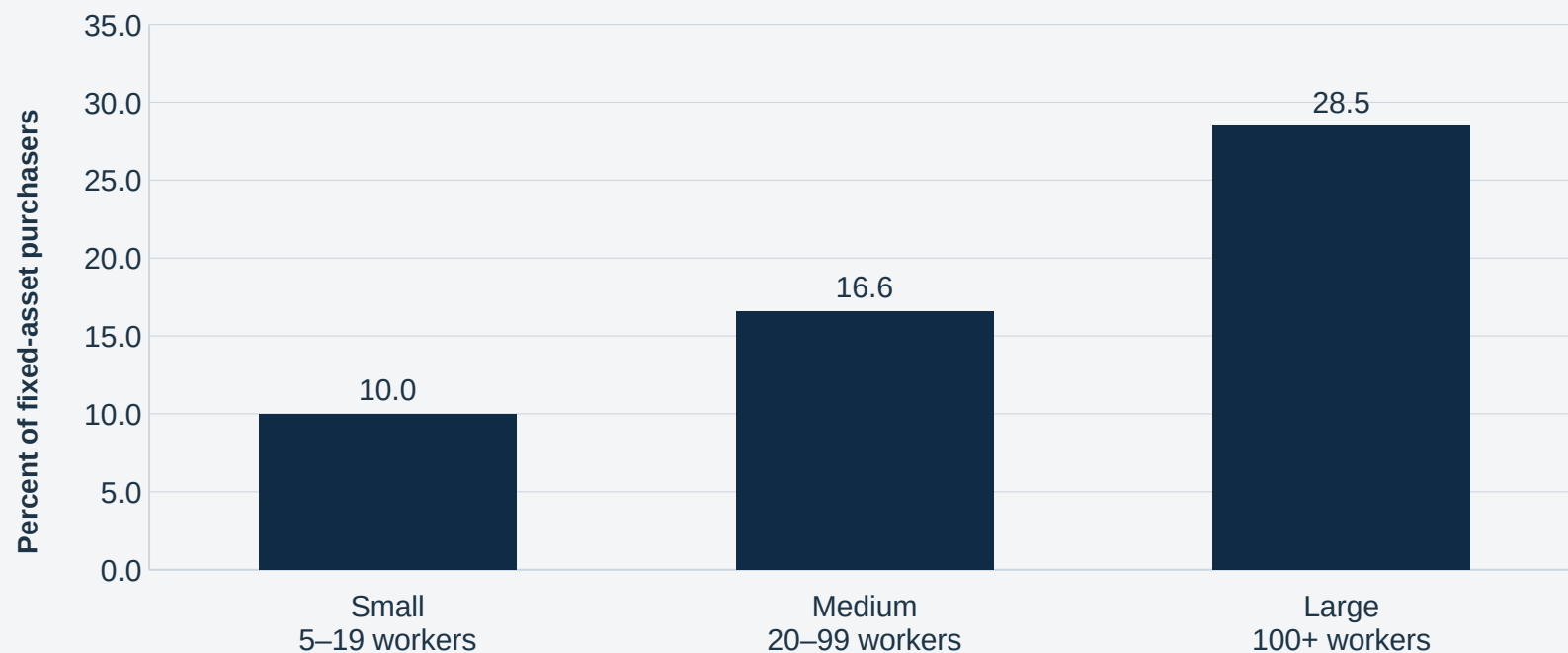
Table 13. Denominators for enterprise-access and finance indicators

Indicator	Correct denominator	Illustrative published Ghana statistic
Firms with a bank loan	Eligible surveyed firms; existing use	17% of small firms in Figure 14
Firms using banks for investment	Firms that purchased fixed assets	14.1% overall; 10.0% small
Bank-financed investment proportion	Average firm financing share among fixed-asset purchasers	5.0% overall; not 5% of national investment
Loan rejection rate	Relevant decided loan applications / applicants	Not supplied as a five-sector result here
Finance as biggest obstacle	Eligible responding firms choosing one principal obstacle	39.2% overall; not a rejection percentage

Bank use for investment also varied by firm size

Share of fixed-asset purchasers using bank finance; Ghana 2023 profile.

Figure 11. Fixed-asset purchasers using bank finance



Population: surveyed formal, eligible non-agricultural firms that purchased fixed assets. Not all businesses.

Overall published estimate

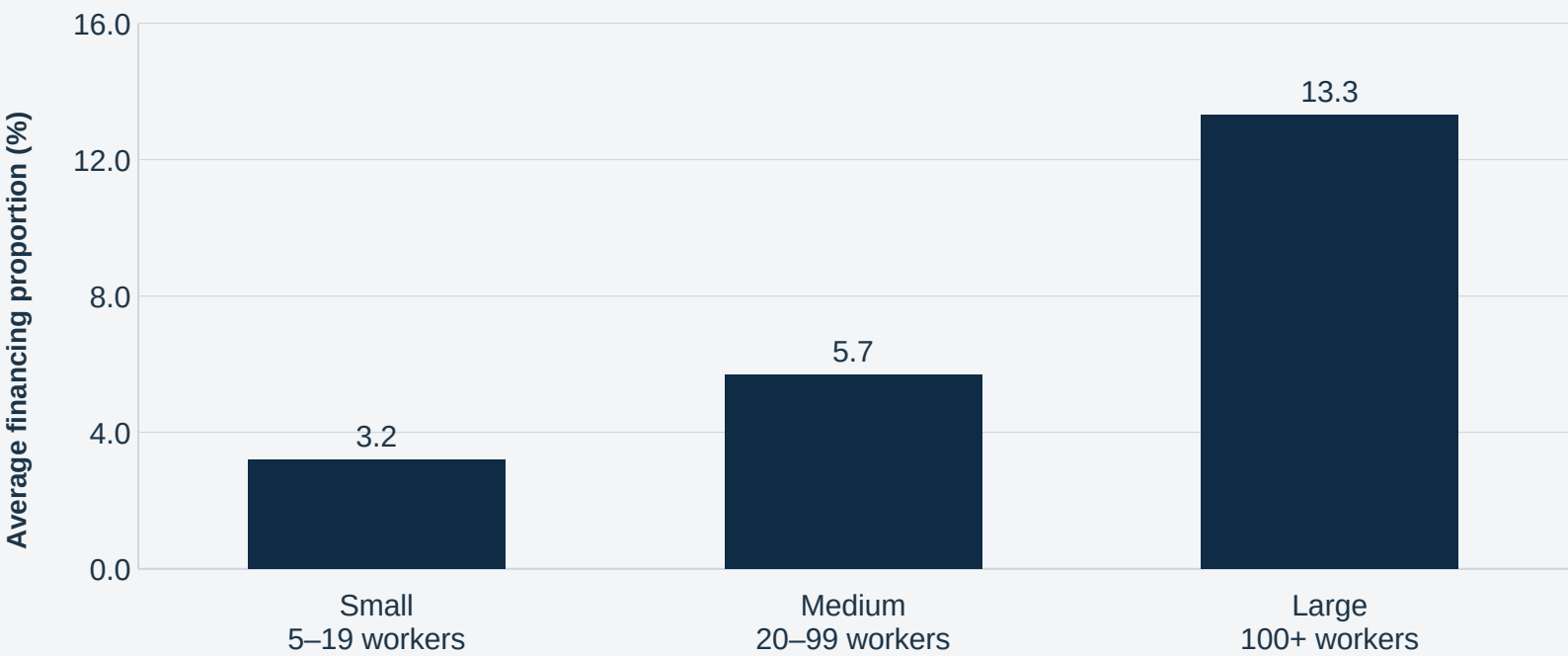
14.1% of fixed-asset purchasers used bank finance.

This is an incidence measure, not the share of investment value financed by banks.

Banks financed a small average share of firms’ investment expenditure

Average bank-financed share of fixed-asset purchases; Ghana 2023 profile.

Figure 12. Average bank-financed proportion of investment by firm size



Keep the two measures apart

14.1%: firms using bank finance for investment.

5.0%: average investment share financed by banks.

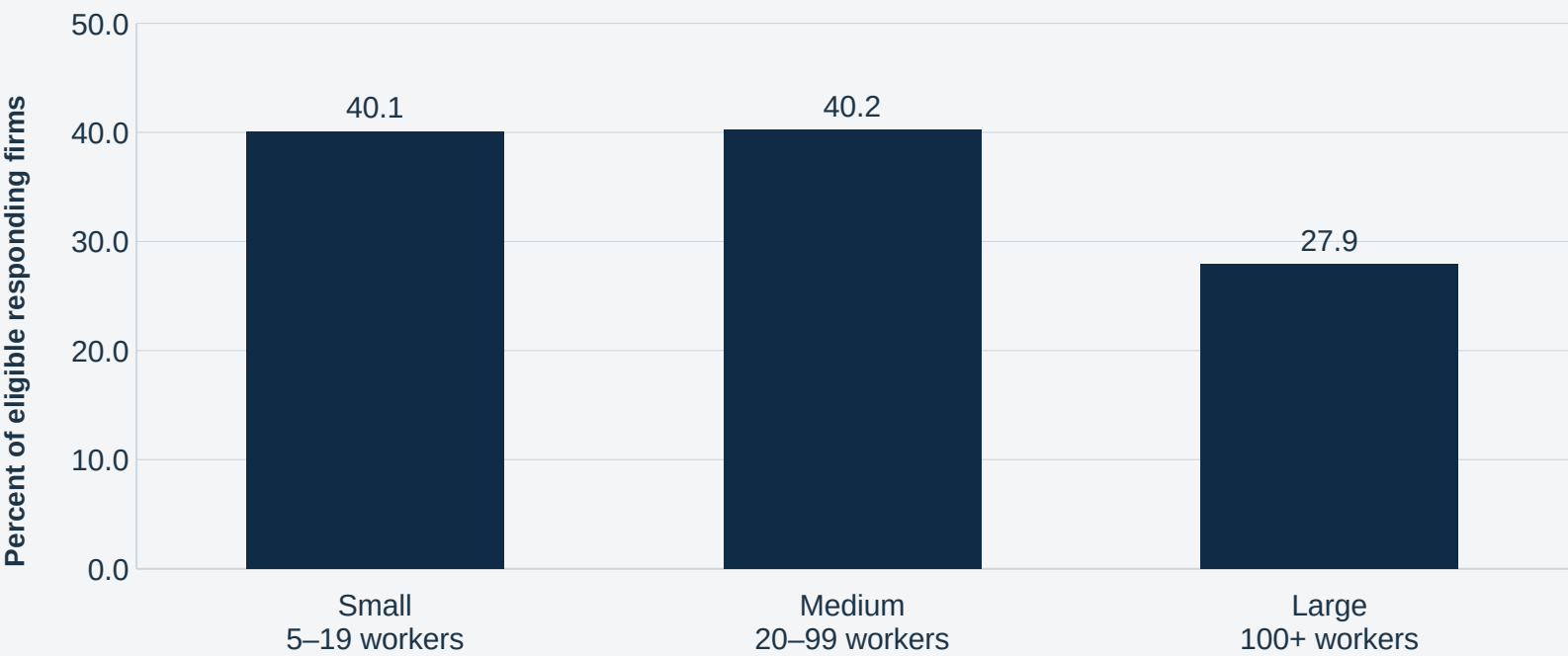
Both refer to fixed-asset purchasers.

These are average firm financing proportions among fixed-asset purchasers, not shares of national investment.

Finance was frequently identified as the main business obstacle

Respondents identifying access to finance as their biggest obstacle; Ghana 2023 profile.

Figure 13. Reported importance of access to finance



Historical context

39.2% of eligible firms identified finance as the biggest obstacle.

The data do not establish that this percentage persisted in 2026.

A “biggest obstacle” response is not a failed loan application or a measured amount of unmet financing.

Sector stock totals do not supply a five-sector access probability

The missing denominator is eligible enterprises—not the outstanding-credit total.

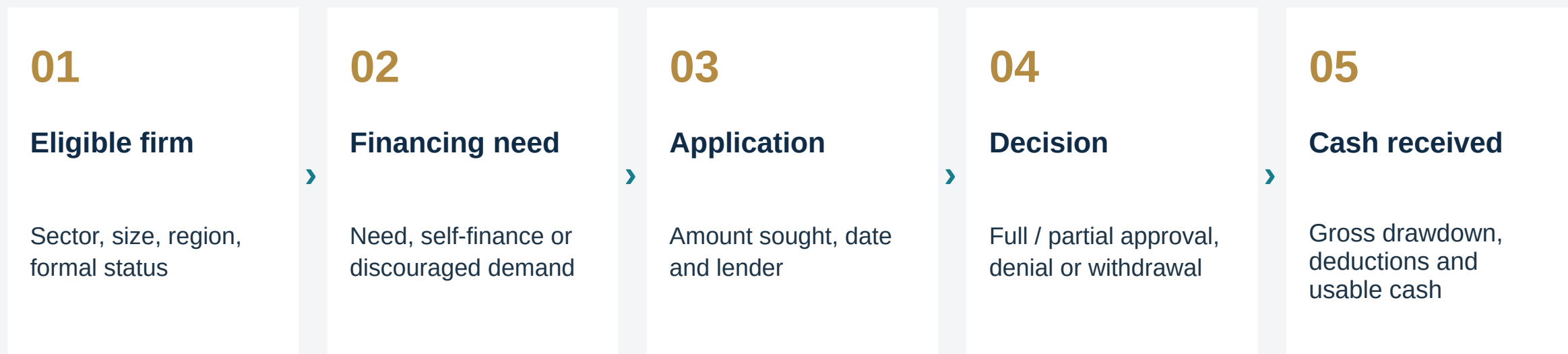
Table 14. What is known about sector allocation and sector access

Requested activity	Stock comparison	Current sector access estimate	Evidence needed
Agriculture*	Available in A.5	Not estimated; outside main ES frame	Agricultural firm / producer finance frame
Manufacturing	Available in A.5	Not supplied by the profile at this resolution	Sector × size weighted microdata
Construction	Available in A.5	Not supplied by the profile at this resolution	Applications, decisions and enterprise frame
Commerce	Commerce & finance used	Not separately identified for pure commerce	Activity crosswalk and firm outcomes
Services	Source bucket used	Not separately identified for this source bucket	Subsector and borrower-type matching

“Not estimated” is not zero access; it identifies the data needed for the next research stage.

Follow the enterprise from financing need to usable cash

A proposed measurement sequence; no stage counts are invented.



Approval rate = approved applications / decided applications | **Enterprise access = firms with credit / eligible firms**

The amount of credit is only one component of enterprise access

Comparable offers require the same borrower, purpose, maturity, currency and cost convention.

Table 15. A comparable enterprise-finance record

Access dimension	Record to collect	Comparison safeguard
Price	Coupon, benchmark, spread and every compulsory fee	Use a common dated cash-flow convention
Maturity and repayment	Tenor, grace period, amortisation, bullet / revolving basis	Do not compare flat and reducing-balance labels
Security	Accepted assets, valuation, coverage, guarantees and cash pledge	Distinguish refundable restrictions from fees
Usable amount	Net cash received and timing of staged drawdowns	Approved amount need not equal usable finance
Borrower mix	Baseline risk, enterprise size, loan purpose and history	Changing composition can change average outcomes

Source: IDER calculations / explicitly assumed scenarios / proposed design; see author's notes.

Use the sector evidence to structure due diligence, not to set a quota

The report supplies exposure and measurement diagnostics—not expected returns or optimal lending shares.

Table 16. Sector-specific due-diligence questions

Activity	Observed signal	Business-intelligence check
Agriculture*	Share fell despite 4.0% real growth	Seasonal cash flows; vintage, recovery and borrower concentration
Manufacturing	Real growth turned positive in the later window	Working capital versus equipment; import-currency exposure
Construction	Large stock increase and a larger allocation share	Project / contractor concentration; staged cash drawdowns
Commerce & finance	Narrow and trade-inclusive scopes differ	Separate finance, import, export and retail borrowers
Services	Largest focus-sector stock, but share edged down	Subsector and institutional borrower composition

Sources: BoG July 2026, retained inputs. [S01](#).

The same evidence supports different institutional decisions

The analytical uses below do not imply adoption or commissioning by the named institutions.

Table 17. Use of the report by its principal audience

Audience	Immediate analytical use	Decision boundary
Ministry of Finance	Read activity stocks with aligned economic-sector and financing data	No optimal sector quota or causal programme verdict
Bank of Ghana	Reconcile classification, borrower identity and gross-flow reporting	Do not treat stock change as new loans granted
Banks / fund managers	Monitor balances, vintages, concentration and contractual terms	No sector expected-return ranking
Businesses / SME associations	Compare written offers and document applications and access barriers	An aggregate lending rate is not a binding quotation
Investors / research partners	Separate exposure growth, real purchasing power and new financing	No investment signal inferred from three snapshots

Descriptive allocation does not identify why credit went to a sector

Three annual snapshots cannot isolate loan supply, borrower demand or the effect of a policy.

What is identified

The distribution of the reported stock, its nominal and CPI-deflated growth, and accounting contributions under stated definitions.

What is not identified

Whether supply restrictions, weak demand, risk, policy or valuation caused a sector's share or growth rate to change.

What could strengthen inference

A separate evidence annex links Ghana experiments, explicit estimands, randomized-offer and bank–firm designs, selection bounds and power planning.

Build a loan–enterprise panel before estimating access mechanisms

The unit and population must match the intended causal or descriptive claim.

Table 18. Design requirements for a subsequent linked-data study

Research target	Needed unit / outcome	Key design condition
Within-firm credit supply	Same firm, different banks, same period	Defensible bank-specific shock; demand and dependence controls
New financing	Dated gross originations and refinancing-adjusted cash	Complete repayment and lender-switch records
Sector access	Eligible firms, applications, decisions and drawdowns	Representative frame, denominator and nonresponse treatment
Distributional effects	Firm size, region, risk and activity fixed before exposure	Predefined subgroups; uncertainty and multiple-testing disclosure

Sources: World Bank methodology; Khwaja & Mian (2008). [S05](#), [S08](#).

Represent firms that did not receive loans—not only successful borrowers

A proposed population-aware design for sectoral enterprise access.

Table 19. Selection-aware sector access measurement

Design issue	Proposed treatment	Release requirement
Outside the original survey frame	Construct / agree separate agriculture and microenterprise frames	State included and excluded populations
Nonresponse and unequal sampling	Document sampling probabilities, weights and response adjustments	Show coverage, weight tails and effective sample
Denied or withdrawn applicants	Retain decision status and requested amounts	Do not assign a zero interest rate to no loan
Missing versus zero financing	Different fields for observed zero, absent record and ineligibility	Publish missingness and flow reconciliation
Unobserved selection	Sensitivity analysis under explicit assumptions	No assertion that weighting alone removes selection bias

A SMART dashboard ties every indicator to a denominator and owner

Proposed controls and frequencies—not observed achievements or regulatory requirements.

Table 20. A measurable sector-credit monitoring system

Indicator	Definition and unit	Frequency / proposed owner
Sector allocation	Sector private stock / full private stock; %	Monthly; bank returns / BoG research
Real credit growth	Exact CPI-deflated and, separately, constant-currency growth; %	Monthly; research team
New cash financing	Dated disbursements; refinancing and repeat drawdowns flagged	Monthly; bank data stewards
Enterprise reach	Unique firms with credit / eligible firms; % by sector × size	Quarterly; registry / survey team
Access and usability	Applications, approvals, drawdowns and net cash received	Monthly; participating banks
Data quality	≥98% mandatory-field completeness; unresolved gaps disclosed	Each release; independent checking function

Source: IDER calculations / explicitly assumed scenarios / proposed design; see author's notes.

A 90-day programme can establish a repeatable reporting system

Timing begins after institutional approval and data-access agreements.

Table 21. Conditional 90-day delivery schedule

Period	Deliverable	Acceptance criterion
Days 0–15	Definitions, population, source inventory and data-governance agreement	Activity / borrower / currency rules approved
Days 16–30	Historical intake and cross-table / stock–flow reconciliation	Material exceptions reviewed; audit trail retained
Days 31–60	Sector–size access panel and descriptive quality checks	Coverage and weights documented; prices and flows separated
Days 61–90	Supported findings, independent replication and briefing release	No unsupported causal claim; figures and source records reconciled

A six-month prospective outcome requires six months of follow-up; the 90-day plan covers protocol and pilot setup.

Four linked records are needed to move from balances to enterprise access

An empty data-collection template accompanies the report; acquisition remains subject to authorisation.

Table 22. Minimum linked-data architecture

Data record	Core fields	Linkage / protection
Enterprise	Principal activity, borrower type, employment size, region, formal status	Pseudonymous firm ID; crosswalk version
Application	Need, requested amount, dates, decision, approval and withdrawal	Application ID; eligibility denominator
Loan and terms	Purpose, currency, tenor, coupon, fees, collateral, risk and reset terms	Loan–bank–firm IDs; dated terms
Cash-flow ledger	Disbursement, repayment, write-off, valuation, transfers and closing balance	Dated transaction ID; reconciliation rules
Governance	Permissions, source versions, exceptions and disclosure controls	Controlled access; retain reproducibility metadata

Source: IDER calculations / explicitly assumed scenarios / proposed design; see author's notes.

Stronger empirical detail does not turn a stock table into an experiment

Completed accounting analysis, assumption-based sensitivity and causal evidence have different roles.

Table 23. Empirical evidence and causal status

Evidence block	Completed work	Interpretation
Sector accounting	Concentration, mix movement, shift–share and real-growth decomposition	Exact descriptive calculations
Measurement sensitivity	Alternative deflators, currency exposure and missingness envelopes	Assumed parameters; not confidence intervals
Ghana experiments	Published grant coefficients and agricultural-risk findings	Attributed historical causal evidence
New bank-credit study	Explicit trial / quasi-experimental protocol and power scenario	Proposed; no new causal coefficient

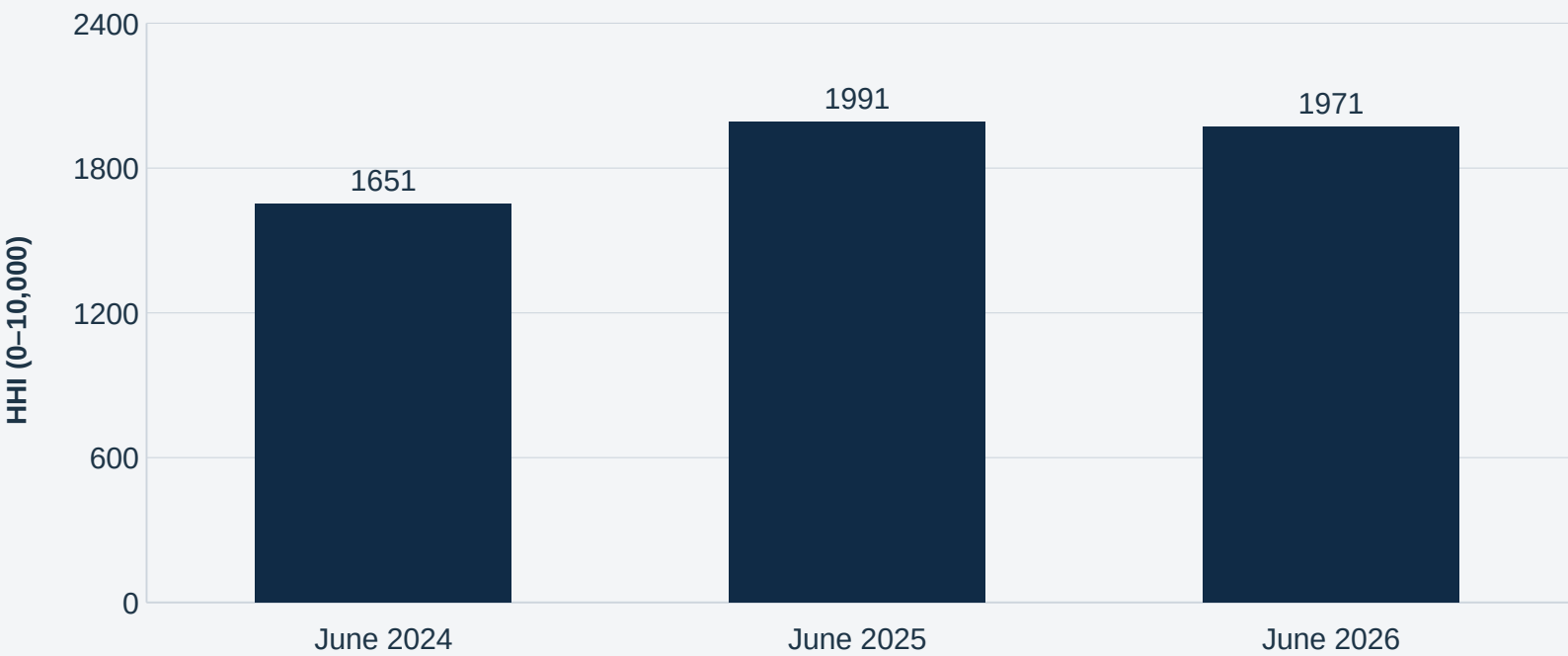
No instrument, randomization, survey microdata or borrower-level panel is invented for the existing stock data.

Sources: BoG July 2026, retained inputs; World Bank Ghana 2023 profile; Fafchamps et al., author version (2013). [S01](#), [S02](#), [S09](#).

Sector concentration rose in 2025 and changed little in 2026

Herfindahl index across the same eleven activity groups; end-June stocks; index scale 0–10,000.

Figure 14. Concentration of outstanding credit across source activities



Effective groups

2024: 6.06
2025: 5.02
2026: 5.07

Grouping-sensitive—not the number of firms served.

Broad services and commerce classifications affect the index; no antitrust threshold or borrower-level inference is applied.

A different sector mix need not mean credit was transferred between firms

Total variation compares allocation shares; its stock-scaled equivalent is not a transaction flow.

Table 24. Allocation-mix distance under an unchanged classification

June comparison	Mix movement (pp)	Closing-stock equivalent	What it measures
2024 → 2025	6.73	GHS 5.70bn	Distance between activity share vectors
2025 → 2026	6.12	GHS 7.32bn	Same definition; a larger closing stock

Classification sensitivity

Merging commerce, import and export trade raises the 2026 HHI from 1,971 to 2,245.
Keep source labels and aggregation rules fixed before comparing concentration.

Sources: BoG July 2026, retained inputs. [S01](#).

Overall expansion and relative allocation reconcile to each stock change

Year to June 2026; GHS billion; constant opening shares are a descriptive benchmark.

Table 25. Exact accounting bridge for the five focus groups

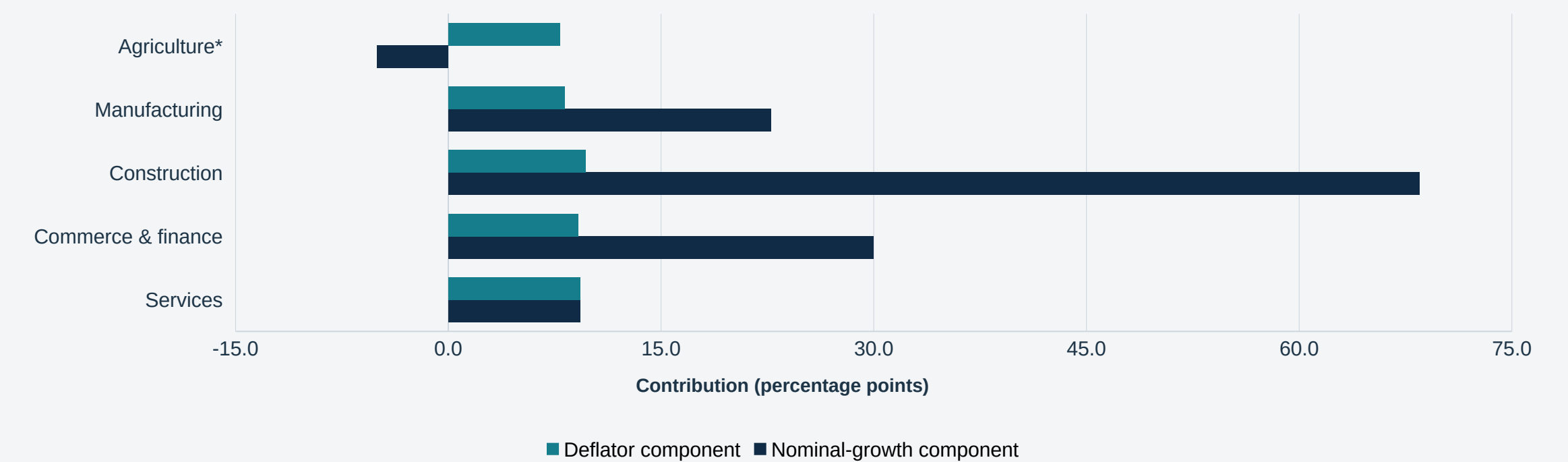
Activity	Common expansion	Relative allocation	Actual stock change
Agriculture*	1.44	-1.11	0.33
Manufacturing	3.87	-1.10	2.78
Construction	3.08	+2.60	5.67
Commerce & finance	5.44	+0.85	6.29
Services	13.09	-1.02	12.08

This benchmark is neither an optimal sector share nor the counterfactual allocation without a policy.

Real-growth acceleration combines nominal expansion and disinflation

Change in annual CPI-deflated growth between the two June windows; percentage-point contributions.

Figure 15. Components of the acceleration in real credit growth



Order-averaged accounting contributions, not estimated causal effects of inflation or monetary policy.

Purchasing-power growth depends on the relevant deflator

Year to June 2026; only 5.30% is the retained headline CPI input; other columns are assumptions.

Table 26. Real-growth sensitivity to alternative price changes

Activity	0% assumed	5.30% CPI	10% assumed	15% assumed
Agriculture*	9.5%	4.0%	-0.4%	-4.8%
Manufacturing	29.5%	23.0%	17.7%	12.6%
Construction	75.9%	67.0%	59.9%	52.9%
Commerce & finance	47.6%	40.2%	34.2%	28.4%
Services	38.0%	31.0%	25.4%	20.0%

Alternative price changes are sensitivity assumptions, not additional official observations.

Currency valuation can change the interpretation of real stock growth

Assume 25% of the closing loan stock is foreign-currency valued; vary the conversion-rate change.

Table 27. Assumed constant-currency, CPI-deflated growth

Activity	FX rate –20%	No FX-rate change	FX rate +20%
Agriculture*	10.5%	4.0%	-0.3%
Manufacturing	30.7%	23.0%	17.9%
Construction	77.5%	67.0%	60.1%
Commerce & finance	49.0%	40.2%	34.4%
Services	39.2%	31.0%	25.6%

Exchange-rate changes and FX shares below are assumed. No claim is made that Ghana experienced these scenarios.

Firm-size gaps require consistent populations and distinct denominators

Published Ghana 2023 estimates; differences are descriptive, not effects caused by enterprise size.

Table 28. Published size gaps and their populations

Indicator	Small	Large	Large – small	Denominator
Bank-loan participation	17.0%	43.0%	+26.0 pp	Eligible establishments
Banks used for investment	10.0%	28.5%	+18.5 pp	Fixed-asset purchasers
Investment financed by banks	3.2%	13.3%	+10.1 pp	Mean firm share among purchasers
Finance: biggest obstacle	40.1%	27.9%	–12.2 pp	Eligible responding establishments

Formal, eligible non-agricultural establishments with at least five workers; interviews February 2023–February 2024.

Missing outcomes can alter the size gap under explicit assumptions

Worst-case binary-access bounds within the same target domains, including source-rounding uncertainty.

Table 29. Assumption-based missingness and rounding envelopes

Assumed missing share	Small: access range	Large: access range	Gap range (pp)
0%	[16.5, 17.5]%	[42.5, 43.5]%	[25.0, 27.0]
5%	[15.7, 21.6]%	[40.4, 46.3]%	[18.8, 30.6]
10%	[14.8, 25.8]%	[38.2, 49.1]%	[12.5, 34.3]
20%	[13.2, 34.0]%	[34.0, 54.8]%	[0.0, 41.6]
30%	[11.6, 42.2]%	[29.8, 60.5]%	[-12.5, 48.9]

The missing fraction is not observed here. These envelopes do not remove unmeasured treatment confounding.

Define an intervention before claiming a causal sector-credit effect

Sector membership, credit receipt and an exogenous financing offer are not interchangeable treatments.

Table 30. Separate descriptive and causal targets

Target question	Intervention / comparison	Primary outcome and population
Does an offer expand access?	Randomized optional offer among equally eligible applicants	Receipt of bank credit by six months; all assigned firms
Does bank supply matter?	Credible bank-specific shock; same firm across banks	Loan flow / stock within covered relationships
Does financing change business activity?	Assigned financing offer, measured before outcomes	Investment, employment, profits; all assigned firms
Who is excluded?	Representative domain survey, not treatment assignment	Sector × size participation and application outcomes

Sources: Khwaja & Mian (2008); Fafchamps et al., author version (2013); Karlan et al., author version (2013). [S08](#), [S09](#), [S10](#).

A Ghana randomized grant study provides separately identified evidence

Fafchamps et al.: published pooled intent-to-treat estimates; real monthly profits at October 2008 prices.

Figure 16. Published grant effects with reconstructed approximate 95% intervals



Published coefficients $\pm 1.96 \times$ firm-clustered SEs; pointwise intervals. Grants are not loans; no current bank effect is estimated.

Experimental findings require outcome, attrition and population safeguards

Historical grants and insurance identify their own interventions—not Ghana’s current sectoral bank allocation.

Urban microenterprises

Randomized capital grants; profits followed over time. Attrition still requires diagnosis and assumption-based bounds.

Grants are not bank loans.

Agricultural households

Karlan et al. report investment responses to randomized risk coverage in northern Ghana.

Risk and liquidity are separate mechanisms.

External validity

Match intervention, period, enterprise population and outcome before using an experimental estimate.

No national allocation coefficient is imported.

Randomized optional offers can directly test enterprise access

Conditional design: approved governance, informed consent, affordability review and equally eligible applicants.

$$Y_i = \alpha \text{block} + \tau Z_i + \gamma Y_{i,0} + \varepsilon_i$$

Assignment

Z: randomized offer. Stratify on predetermined sector, size and risk. Retain control access to standard channels.

Primary outcome

Any verified bank-credit receipt by six months. Keep non-takers in their assigned group; track all lenders.

Interpretation

τ : effect of the offer in the eligible study population. Loan take-up and loan-price effects are different estimands.

Proposed study only. A six-month effect cannot be reported before its follow-up period has elapsed.

Same-firm comparisons separate common demand from differential supply

The comparison needs an independently defensible bank-specific shock—not merely lagged holdings.

$$\Delta L_{fbt} = \alpha_{fb} + \delta_{ft} + \beta Z_{bt} + u_{fbt}$$

Demand control

Compare the same enterprise across banks and dates. Document relationship entry, exit and lender switching.

Endogeneity test

Defend shock assignment and timing. Test baseline balance, anticipation, alternatives and spillovers.

Population limit

Publish the covered multi-bank population. Measure single-bank SMEs and non-borrowers separately.

No valid shock or linked relationship panel is present in the sector-stock inputs; this equation has not been estimated.

A sector-by-size access estimate needs the survey design—not cell averages

Use observed principal activity and the establishment sample design; separate agricultural and microenterprise frames.

$$\hat{p}D = \sum_i w_i I(i \in D) Y_i / \sum_i w_i I(i \in D)$$

Table 31. Proposed establishment-level domain estimation

Design element	Required implementation	Publication control
Activity and eligibility	Realized activity; size; registration; region	Document exclusions; do not force BoG = ISIC
Weights and strata	Approved weights; preserve full sample design for domains	Eligibility-weight sensitivity and domain coverage
Uncertainty	Design-based standard errors and intervals	No significance claims from rounded aggregates
Frame extension	Dedicated agriculture and <5-worker enterprise frames	Avoid unweighted pooling or double counting

Sources: World Bank methodology; World Bank Ghana 2023 catalogue. [S05](#), [S13](#).

Different selection problems require different remedies

Weighting observed records cannot repair every missing counterfactual or undefined outcome.

Table 32. Remedies tied to their identifying assumptions

Problem	Conditional procedure	What remains required
Unequal sampling / nonresponse	Design weights; nonresponse follow-up; observation IPW	Positivity, measured predictors, design audit
Outcome missing after assignment	Report attrition by arm; Lee bounds when justified	Monotonic selection; always-observed target
Borrowing chosen by the firm	Use randomized offer ITT or a defensible shock	Selection into receipt is not random
No loan versus missing record	Separate access, disbursement and conditional price	No zero coupon for rejected applicants
Unobserved selection / confounding	Declared sensitivity ranges; alternative designs	No assertion that reweighting eliminates it

Sources: Lee (2009); Cole & Hernán (2008); World Bank Ghana 2023 catalogue. [S11](#), [S12](#), [S13](#).

Power depends on independent assignments, not the number of loan rows

Illustrative planning only: access probability 20% versus 25%, two-sided 5% test and 80% power.

Table 33. Hypothetical sample-size planning, not achieved precision

Planning scenario	Approximate target	Additional requirement
Independent assignment, complete follow-up	2,188 firms total	Equal arms; pooled 5 pp effect
Independent assignment, 15% outcome loss	2,574 firms total	Loss allowance does not repair selective attrition
25 firms/cluster; ICC 0.03; 15% loss	178 clusters / 4,450 firms	Simulate actual cluster sizes and assignment
Sector-specific interactions	Not powered by the pooled calculation	Separate prespecified interaction power and multiplicity

Assumed probabilities, attrition and ICC are not estimated Ghana parameters. No trial has been enrolled or completed.

Every added diagnostic has a distinct formula and interpretation

Exact accounting, bounded sensitivity and statistical inference remain separate.

Table 34. Additional calculation definitions and interpretation limits

Diagnostic	Formula	Scope safeguard
Concentration	$HHI = 10,000 \sum p^2$; effective groups = $1 / \sum p^2$	Activity groups, not borrowers
Allocation movement	$D = \frac{1}{2} \sum p_1 - p_0 $	Share-vector distance, not cash transfers
Shift–share	$\Delta L(s) = p(s,0) \Delta T + T(1) \Delta p(s)$	Constant-share accounting benchmark
Real acceleration	$\Delta g^r = 50 \Delta q(d_0 + d_1) + 50 \Delta d(q_0 + q_1)$	Order-averaged identity, not causal mediation
FX restatement factor	$(1 - f_1) + f_1/(1+e)$	Closing FX share and conversion assumptions
Missing binary outcome	$p \in [(1-q)pobs, (1-q)pobs + q]$	Same-domain worst-case envelope

Business intelligence improves when claims follow evidence thresholds

Measurable release conditions for banks, associations, investors and development-finance partners.

Table 35. Evidence gates for business and investment intelligence

Decision need	Evidence before use	Measurable control
Sector exposure monitoring	Issuer / activity / borrower / currency reconciliation	Monthly; freeze classifications and publish exceptions
Fresh enterprise financing	Gross drawdowns, repayments and refinancing ledger	Monthly; ≥98% mandatory-field completeness proposed
Representative access	Eligible establishment domains and nonresponse audit	Quarterly; disclose sample, weights and uncertainty
Causal business effect	Assignment record, preregistered endpoint and attrition checks	Independent replay before any causal release
Portfolio / investment forecast	Out-of-time validation, costs and repayment performance	No return forecast from stock growth or grant effects

Source: IDER calculations / explicitly assumed scenarios / proposed design; see author's notes.

Calculation verification, source authentication and causality are separate

The companion package records what was recomputed, what was rechecked and what remains unavailable.

Table 36. Verification scope and remaining causal boundary

Validation layer	Completed	Boundary
Original calculations	All sector growth, share and stock–flow identities replayed	Conditional on retained BoG inputs
Additional analysis	Concentration, decomposition, currency and selection tests	Scenarios are assumptions, not observed corrections
Published access evidence	26 entries reconciled to World Bank page images	No new survey variance or weighting
Experimental evidence	8 published coefficients; approximate intervals reconstructed	No microdata re-estimation or national extrapolation
Causal bank-credit effect	Explicit assignment, estimand and data protocol	Not identified by the present aggregate dataset

A passing arithmetic check does not establish exogenous treatment assignment, representativeness or primary-bank reporting accuracy.

Calculation definitions used throughout the report

Input values are in GHS million. Figures labelled GHS billion divide those amounts by 1,000.

Table 37. Reproducible measurement conventions

Quantity	Formula	Unit / interpretation
Allocation share	$100 \times L(s,t) / T(t)$	Percent of reported private stock
Nominal growth	$100 \times [L(s,t) / L(s,t-1) - 1]$	Percent change in nominal stock
CPI-deflated growth	$100 \times \{[L(s,t) / L(s,t-1)] / [1 + \pi(t)/100] - 1\}$	Purchasing-power growth; not constant currency
Share change	$\text{Share}(s,t) - \text{Share}(s,t-1)$	Percentage points, not percent growth
Contribution to total growth	$100 \times [L(s,t) - L(s,t-1)] / T(t-1)$	Percentage points of aggregate growth
Share of total increase	$100 \times [L(s,t) - L(s,t-1)] / [T(t) - T(t-1)]$	Percent of a stock increase; not new disbursements

Complete activity-stock inputs 1 / 2

Bank of Ghana Table A.5, July 2026 report. GHS million; published levels, not inferred disbursements.

Table 38. Full source stock values, part 1

Activity / total	June 2024	June 2025	June 2026
Agriculture, forestry & fishing	3,047.99	3,505.61	3,839.60
Export trade	577.22	514.08	327.41
Manufacturing	8,986.70	9,405.91	12,181.64
Transport, storage & communication	4,810.42	4,018.45	3,147.80
Mining & quarrying	2,751.86	2,527.78	7,443.70
Import trade	7,212.92	7,070.12	9,575.07

Source precision retained. At most GHS0.01m separates the sum of activity rows from the reported private total.

Complete activity-stock inputs 2 / 2

Bank of Ghana Table A.5, July 2026 report. GHS million; published levels, not inferred disbursements.

Table 39. Full source stock values, part 2

Activity / total	June 2024	June 2025	June 2026
Construction	7,405.79	7,478.35	13,152.02
Commerce & finance	11,507.33	13,213.80	19,506.51
Electricity, gas & water	2,275.37	2,255.83	2,971.67
Services	24,890.15	31,810.31	43,886.40
Miscellaneous	4,595.97	2,952.19	3,609.28
PRIVATE TOTAL (reported)	78,061.73	84,752.43	119,641.11
Public sector	6,416.98	4,411.57	4,660.27
GRAND TOTAL (reported)	84,478.71	89,164.00	124,301.38

Source precision retained. At most GHS0.01m separates the sum of activity rows from the reported private total.

Source rounding is not statistical confidence

Calculation precision, input precision and causal uncertainty are separate concepts.

Table 40. Year-to-June 2026 real-growth rounding sensitivity

Focus activity	Computed real growth (%)	Conditional rounding envelope (%)
Agriculture, forestry & fishing	4.015	[4.009, 4.020]
Manufacturing	22.992	[22.986, 22.998]
Construction	67.016	[67.008, 67.024]
Commerce & finance	40.192	[40.185, 40.199]
Services	31.019	[31.013, 31.025]

The intervals below are conditional rounding envelopes, not confidence intervals or bounds on all measurement error.

Material source differences are disclosed rather than silently repaired

The core sector shares retain the A.5 private total; no mixed denominator is constructed.

Table 41. Source checks and retained exceptions

Issue	Observed difference	Treatment in the report
A.5 activity sums versus private total	≤ GHS0.01m in June 2024 / 2026	Keep source rows; reported A.5 total controls shares
A.9 versus A.5 private total	+GHS538.89m in June 2025; –GHS546.30m in June 2026	Do not substitute A.9 or derive household-free activity stocks
A.2 real growth versus explicit formula	Source 34.12%; computed 34.06% for June 2026	Report exact reproducible calculation; discrepancy unresolved
Activity versus industry categories	E.g., private commerce & finance 16.3%; industry 24.1%	Keep universe labels; do not combine NPL and activity stocks
Primary source access	Retained parsed-text inputs; renewed PDF access failed	Disclose retrieval boundary; provide exact locators

Sources: BoG July 2026, retained inputs. [S01](#).

Inputs, calculations and the report’s data can be checked separately

The companion package preserves source transcriptions, formulas, outputs and recorded checks.

Table 42. Reproducibility controls and their scope

Validation layer	Available evidence	Boundary
Source provenance	Named document, exact table/page, access status and input hashes	Retained BoG inputs; unresolved source exceptions disclosed
Calculation replay	Decimal checks, ratios, deflation, contributions and identities	Conditional on reported source values and definitions
Chart / table consistency	Editable charts, embedded data, table and figure registers	Does not authenticate the original bank submissions
Enterprise access	26 published survey values rechecked; denominator notes	No survey microdata weighting or new design-based variances
Further research	Published trial evidence; prospective loan-study protocol	No invented borrowers or new national causal coefficient

Source: IDER calculations / explicitly assumed scenarios / proposed design; see author’s notes.

Abbreviations and statistical conventions

The same definitions apply in the report, CSV files and author’s notes.

Table 43. Terms and units

Term	Meaning	Convention
BoG / DMB / ES	Bank of Ghana / deposit money bank / Enterprise Surveys	Institution, reporting perimeter and survey source
GHS mn / GHS bn	Ghana cedi million / billion	GHS1bn = GHS1,000mn
CPI / real growth	Consumer price index / CPI-deflated stock growth	Exact ratio; purchasing-power interpretation
% / pp	Percent / percentage points	Share difference is in pp; stock growth is in %
NPL ratio	Nonperforming loans / corresponding gross loans	Stock quality, not new-borrower default probability
Gross / net lending flows	Cash drawdowns / drawdowns net of principal repayment	Neither automatically equals the stock change
Enterprise access	Credit participation within an eligible firm population	Not a sector’s share of the total loan stock

Source: IDER calculations / explicitly assumed scenarios / proposed design; see author’s notes.

References and source links 1 / 4

Clickable titles; exact source vintage, locators and review scope are documented in the companion register.

S01 Bank of Ghana | 2026

[Monetary Policy Report, July 2026](#)

Table A.5 (printed 43 / PDF 45); Table A.2 (41 / 43); Figure 6.1 (29 / 31); section 6.4 (34 / 36); Table A.9 (44 / 46).

S02 World Bank Enterprise Surveys | 2024

[Ghana 2023 Country Profile](#)

Population and fieldwork: pp. 2–3; Figure 14: p. 7; finance appendix: pp. 11–12.

S03 World Bank Enterprise Surveys | 2022

[Sampling Methodology: Enterprise Surveys](#)

Consolidated sampling note, February 2022; stratification, sampling frames and weights.

References and source links 2 / 4

Clickable titles; exact source vintage, locators and review scope are documented in the companion register.

S04 World Bank Enterprise Surveys | 2026
[Indicator Descriptions](#)
Finance definitions; published profile vintage retained; no new Ghana access estimate.

S05 World Bank Enterprise Surveys | Accessed 2026
[Methodology](#)
Eligibility, stratification and weighting; official methodological framework.

S06 Cartas, José M., and Artak Harutyunyan / IMF | 2017
[Monetary and Financial Statistics Manual and Compilation Guide](#)
IMF Manuals & Guides; DOI 10.5089/9781513579191.069; publication record.

S07 United Nations Statistics Division | 2008
[International Standard Industrial Classification of All Economic Activities, Rev.4](#)
Statistical Papers M/4/Rev.4; named classification reference, not an automatic BoG crosswalk.

References and source links 3 / 4

Clickable titles; exact source vintage, locators and review scope are documented in the companion register.

S08 Khwaja, Asim Ijaz, and Atif Mian | 2008

[**Tracing the Impact of Bank Liquidity Shocks: Evidence from an Emerging Market**](#)

American Economic Review 98(4): 1413–1442; DOI 10.1257/aer.98.4.1413.

S09 Fafchamps, Marcel; David McKenzie; Simon Quinn; Christopher Woodruff | 2014; July 2013 author version

[**Microenterprise Growth and the Flypaper Effect: Evidence from a Randomized Experiment in Ghana**](#)

Journal of Development Economics 106: 211–226; DOI 10.1016/j.jdeveco.2013.09.010. Numerical source: July 2013 author version, Table 3, PDF p. 44, pooled columns 1–4; Appendix 2.

S10 Karlan, Dean; Robert Osei; Isaac Osei-Akoto; Christopher Udry | 2014; December 2013 author version

[**Agricultural Decisions after Relaxing Credit and Risk Constraints**](#)

Quarterly Journal of Economics 129(2): 597–652; DOI 10.1093/qje/qju002. Author version: abstract, introduction and experimental-design section.

References and source links 4 / 4

Clickable titles; exact source vintage, locators and review scope are documented in the companion register.

- S11** Lee, David S. | 2009
[Training, Wages, and Sample Selection: Estimating Sharp Bounds on Treatment Effects](#)
Review of Economic Studies 76(3): 1071–1102; DOI 10.1111/j.1467-937X.2009.00536.x. Author preprint, identification and trimming-bounds sections.
- S12** Cole, Stephen R., and Miguel A. Hernán | 2008
[Constructing Inverse Probability Weights for Marginal Structural Models](#)
American Journal of Epidemiology 168(6): 656–664; DOI 10.1093/aje/kwn164. Abstract and bibliographic record.
- S13** World Bank Enterprise Surveys | 2025 catalogue; 2023 survey
[Ghana — World Bank Enterprise Survey 2023: survey metadata](#)
Reference GHA_2023_WBES_v01_M. Unit of analysis, sampling, weights and data dictionary.

Read who holds credit separately from who can obtain new finance

The report identifies allocation and purchasing-power changes—not the number of new beneficiary enterprises.

Allocation and growth

All five focus stocks grew after CPI deflation. Added diagnostics separate overall expansion, sector-mix movement and price effects.

Enterprise experience

Published size gaps are not effects of firm size. Missingness and currency scenarios show which interpretations depend on unmeasured inputs.

Next evidence requirement

Historical experiments identify different interventions. A new bank-credit effect requires defensible assignment, linked outcomes and population-aware inference.



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