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CSAF financial benchmarking

Final learning report

July 2018

Executive Summary (1/4): Context

- **An estimated 75% of the market demand for smallholder agricultural finance is not being served**, meeting only an estimated \$50 billion of the more than \$200 billion demand across Latin America, Sub-Saharan Africa, and South and Southeast Asia.¹ This market sizing includes financing needs both at the farmer level and for SMEs operating in agricultural value chains. Agricultural small and medium-sized enterprises (SMEs) provide important services such as access to inputs, credit, agronomic training, and market linkages for smallholder farmers and also create employment via value-added processing, transportation, and other services. Access to finance for smallholder farmers and SMEs along agricultural value chains is critical to boost agricultural productivity, improve farmer livelihoods, create jobs, strengthen food security & nutrition, and build resilience to climate change.²
- **Given the characteristics of rural areas and agriculture-based economic activities, lending to agricultural SMEs faces a number of challenges, in addition to those inherent in any financial intermediation.** These specific challenges are related to crop seasonality and price volatility, external risks like climate change or crop disease, and higher cost to serve low population densities. In less developed markets with poor physical infrastructure (e.g., sub-par roads, electricity, ports) and a weak enabling environment (e.g., non-existent or inadequate insurance markets, disaster relief, collateral registry, credit bureaus, arbitration), lenders serving agricultural SMEs feel these challenges even more acutely.
- **Preliminary evaluations indicate that extending finance to credit-constrained agricultural SMEs generates significant impact for both enterprises and farmers.** An academic evaluation conducted on lending by one member of the [Council on Smallholder Agricultural Finance \(CSAF\)](#) found that access to finance for credit-constrained enterprises directly increases enterprise growth as SMEs purchase more volume from farmers and at higher prices than they would have otherwise.³ In a separate analysis of its own data, one CSAF lender found that half of enterprises borrowed for five consecutive years and those borrowers increased their sales at an annual rate of 24 percent over this period. The same lender has conducted impact studies on 30 borrower enterprises and found that incremental income to farmers affiliated with these enterprises typically ranges from 10-25 percent, with some variation on either end.
- **Knowledge about capital supply and demand in the agricultural sector has primarily been concentrated in the direct-to-farmer segment of the market.** Much less is known about the market size or segmentation of agricultural SMEs, or the financial performance of intermediaries serving agricultural SMEs in the “missing middle” – the gap between microfinance and lending by commercial banks to larger enterprises.
- **Based on empirical observations that the missing middle persists in the agriculture sector** and anecdotal evidence suggesting that the economics of those few lenders serving the segment are challenging at best, we hypothesize that public and philanthropic interventions are required to unlock market development. Donors have invested in building markets like microfinance. The question is whether and how to do the same for agricultural SME finance. Given the current state of information about the agricultural SME finance market, it is difficult to identify where interventions are most urgently required, design solutions, and mobilize stakeholders to fund and implement them.

(1) Initiative for Smallholder Farmer Finance and Rural Agriculture Finance Learning Lab, “Inflection Point: Unlocking growth in the era of farmer finance”, 2015

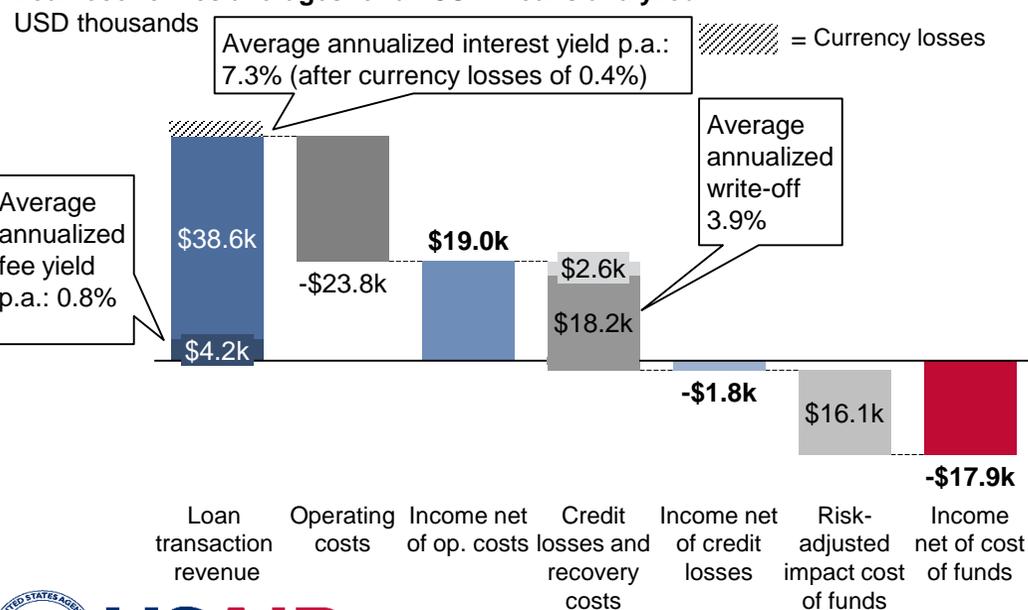
(2) Further supporting evidence in appendix, page 64

(3) Blouin, Arthur and Macchiavello, Rocco, “Strategic Default in the International Coffee Market,” Working Paper F-89305-CCP-1, International Growth Centre, 2017.

Executive Summary (2/4): Project approach and findings

- **To inform this dialogue, data about the costs and risk to serve agricultural SMEs, as well as the impact generated when they have reliable access to finance are required.** However, few quantitative assessments of the financial performance of lenders serving agricultural SMEs are available. Obtaining this data from lenders is difficult due to data security concerns, competition, and complexity of standardizing and analyzing the data. The analysis shared in this report draws upon an original and rich dataset and represents a leap forward in understanding the economics of the nascent agricultural SME finance industry.
- **To perform this first-of-its-kind analysis, and quantify the economics of lending to agricultural SMEs, Dalberg worked with nine members of the Council on Smallholder Agriculture Finance (CSAF) to gather information and create a unique database of lending performance by segment.** The database brings together information on 3,556 individual loans, including transaction revenues and costs, operating costs, and impact-adjusted costs of funds, allowing the analysis of the conditions and segments for profitability and unprofitability of lending in this market. This report was the first phase of work focused on social lending organizations which are members of CSAF. A second phase from June through August will survey local financial institutions as well, to provide data that is representative of the local market and give a more comprehensive view on lending economics of commercial lenders in sub-Saharan Africa.

Loan economics averages for all CSAF loans analyzed



- **The economics of lending to agricultural SMEs are challenging.** On average, a CSAF loan analyzed lost ~\$1,000, representing 0.34 percent of the average loan size of \$665,000.
 - **The average income from loans analyzed was ~\$42,900,** representing an annualized interest + fee yield p.a. of 8.1 percent.
 - **The average operating cost per loan was ~\$23,800,** including costs of origination, servicing and allocated overheads.
 - **The average credit losses including recovery costs was ~\$20,000.** The majority of these costs came from the <10 percent of the loans with associated recoveries.
 - **The average cost of funds associated with the loans was \$16,100** assuming an average 3% p.a. below-market capital for social lending
- **Nevertheless, over 50 percent of the CSAF loans analyzed were profitable** (before accounting for costs of funds). These loans tended to cluster in specific segments, such as loan sizes larger than \$500,000, and loans in coffee and cocoa, which were were profitable on average for CSAF lenders.

Executive Summary (3/4): Segment findings

- **The analysis revealed large variations in financial performance across the different segments of the agricultural SME market.** Using five testable segmentation drivers, we traced the differences in loan-level profitability by region, facility size, borrower status, value chain, and loan tenor. The findings are summarized below.
 - **Region: On average, CSAF loans in Sub-Saharan Africa were less profitable than loans in other regions.** Loans in Sub-Saharan Africa represent only one-fifth of overall loans analyzed and show lower profitability due to higher credit losses. They were also twice as likely to end up in recovery, and had 22 percent higher operating costs than in other geographies, resulting in net losses (after credit losses and overheads) for the loans analyzed.
 - **Facility size: Of the CSAF loans analyzed, smaller loans tended to have lower profitability.** While over half the loans disbursed were below \$500,000, they showed lower profitability. This was driven by the lower interest income, even though operating costs incurred were the same. They also showed an 80 percent higher risk of impairment than those above \$500,000. Given these factors, the loans under \$500,000 (after credit losses and overheads) had net losses.
 - **First-time borrowers: Loans to new borrowers were significantly less profitable than those to existing borrowers.** Less than one-quarter of the loans analyzed went to new borrowers; these were loss making on average due to higher risk and costs to serve. The data and surveys from the lenders showed that new borrowers incurred 50 percent higher origination costs and had twice the risk of impairment. Consequently, first-time borrower lending (after credit losses and overheads) had net losses on average.
 - **Value chain: Lending in coffee and cocoa value chains was more profitable than lending in other crops.** Two-thirds of all capital lent over the period analyzed went to the coffee or cocoa value chains, perhaps because of their more mature and predictable market. Analysis showed that loans outside the coffee and cocoa value chains carried 2.5 times the risk of impairment, and several lenders also reported higher origination costs for them. As a result, loans to crops other than coffee and cocoa were marginally loss-making, while coffee and cocoa loans (after credit losses and overheads) yield a positive return.
 - **Tenor: Long-term loans (12 months or more) were less profitable than shorter-term lending (less than 12 months).** Nearly three-quarters of loans analyzed were lent for short-term financial needs. Given the unpredictability and irregularity of cash flows in agriculture, longer-term lending may be perceived as higher risk. Of those analyzed, loans with tenors of more than 12 months were unprofitable on average and had a 4 times higher risk of impairment. Long-term loans incurred net losses on average (after credit losses and overheads)
- **Lower profitability in some segments versus others has three primary causes:** lower revenues due to lower interest or fee revenue, higher operating costs to serve, and/or higher risks due to increased likelihood of delinquency or impairment.

Executive Summary (4/4): Implications

- **Evidence suggests improved capital flows to agricultural SMEs can help boost smallholder farmer productivity, incomes and resiliency to shocks¹.** The CSAF financial benchmarking analysis suggests the economics of providing capital is hard, particularly in some segments. Donors could play a critical role to help bridge the financing gap for agricultural SMEs serving smallholder farmers by supporting initiatives that can improve the sustainability of lending in high-impact segments through blended finance tools and other supporting mechanisms to close the financing gap.
- **Donor interventions to stimulate the agricultural finance market should adhere to certain principles:** 1) Market-orientation: to incentivize competition, efficiency, and innovation that will drive down the requirement for subsidy over time, 2) Additionality: to complement current market activity, and maximize participation of private capital, and 3) Alignment with impact objectives. Four types of blended finance instruments that can unlock the flow of finance to agricultural SMEs serving smallholder farmers can be explored:
 - **Output-based incentives:** A financial incentive facility can be used to promote financial access to segments with low or negative profitability but high impact potential. Such incentives could follow a pay-per-loan model based on tiered scoring of loan characteristics and the likelihood of reaching certain impact goals, such as lending to smaller SMEs (with smaller financing needs).
 - **Risk mitigation:** This financial incentive allows lenders to explore riskier segments. A facility such as partial credit guarantees and/or “first-loss” buffers, which might be appropriate for different segments, may be considered to encourage lending in new, underserved segments perceived to be high risk, such as first-time borrowers or long-term lending.
 - **Direct funding:** Providing balance sheet support or concessional funding for lenders to increase their risk appetite frees up capital for lending to high-impact segments with higher perceived and real risk. Such segments could include loose value chains or frontier markets.
 - **Technical assistance:** In addition to direct financial support to lenders, offering advisory support to lenders can help lower their operating costs, and to borrowers to can help reduce their risk profile, especially in high costs segments, such as first-time borrowers and SMEs in loose value chains.
- **A broader set of donor actions taken in concert could improve the attractiveness of agricultural SME loans.** Other initiatives might include providing funding for disruptive technological innovations and/or promoting competition from new actors with potentially disruptive business models. Finally, donors could focus on providing highly coordinated value chain or enabling environment interventions to help lower transaction costs, increase scale and/or reduce risk.
- **By the end of Q3 2018, we expect to have a broader dataset that includes local banks and non-bank financial institutions in East Africa.** This data provides, for the first time, transparency on the current financial performance of lenders serving agricultural SMEs and allows for frank discussions about what interventions might be required to catalyze a more competitive and sustainable market.

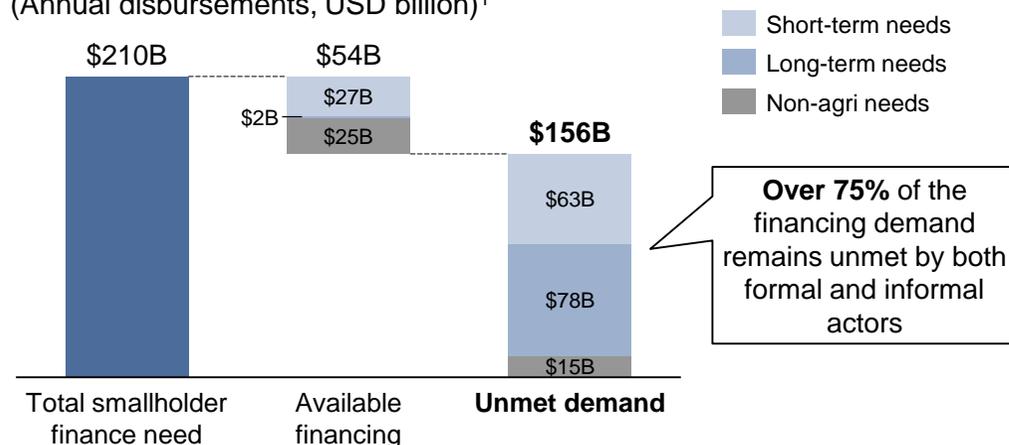
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Three quarters of smallholder farmer financial needs remain unaddressed due to market and sector characteristics

Demand for smallholder farmer financing
(Annual disbursements, USD billion)¹

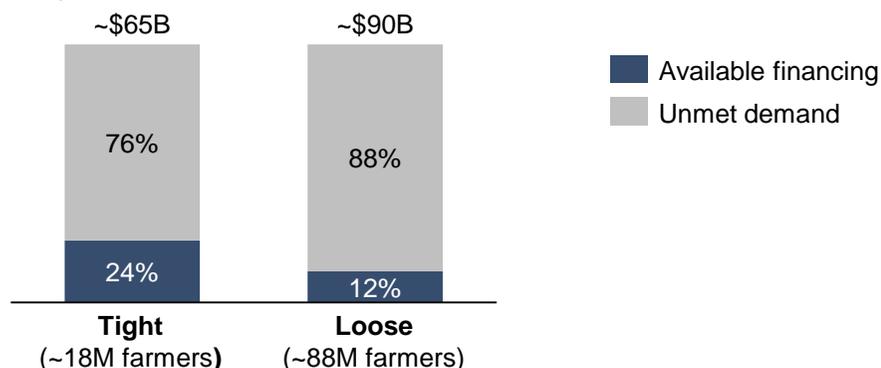


Smallholder farmer finance meets only around \$50 billion of the \$200 billion demand across Latin America, Sub-Saharan Africa, & South/Southeast Asia*. There is also an important, not yet sized need at the agricultural SME level, according to CSAF members.

Several agriculture and SME-related risks and costs deter lenders from bridging this financing gap²:

- **High risk:** seasonality and uncertainties of crop production, currency volatility implying high hedging costs, crop price volatility, climate change and increased extreme weather events
- **High servicing costs:** providing financial services to rural populations can lead to higher transaction costs, and FSPs often lack knowledge on how to manage these costs

Financial needs and disbursements of commercial smallholder* farmers by value chain (USD Billion)¹



The above factors weigh more heavily when lending to the most vulnerable segments of the market:

- **More risk in loose value chains as opposed to tight value chains³** i.e., formalized, consolidated markets with clear standards and specific contractual obligations (e.g., coffee)
- **More risk for new borrowers** due to lack of track record
- **More risk for long term loans** due to the volatility of agriculture markets⁴

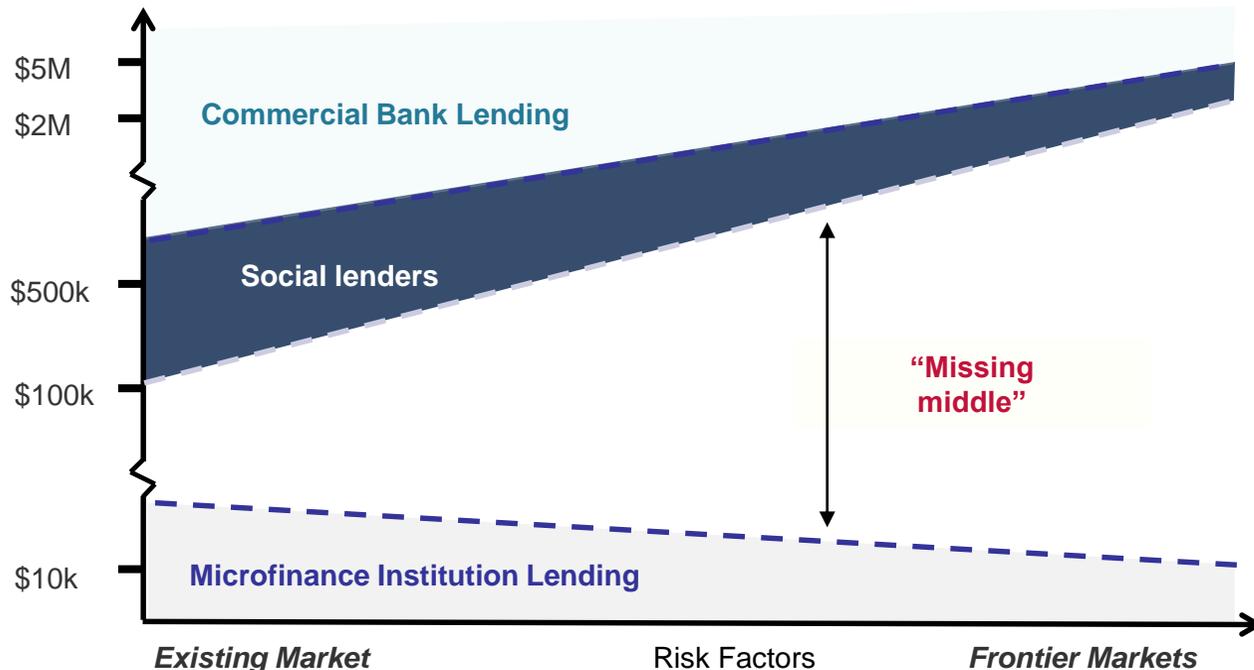
(1) Inflection Point: Unlocking growth in the era of farmer finance, Initiative for Smallholder Finance and Rural Agriculture Finance Learning Lab and executed by Dalberg, 2016 (2) Risk in Agriculture, USDA, 2015; World Bank, Agriculture Finance, 2015 (3) Segmentation of Smallholder Households: Meeting the Range of Financial Needs in Agricultural Families, CGAP, 2013 (4) Catalyzing Smallholder Agricultural Finance, Dalberg, 2012
Notes: (*) Supply includes formal, informal fin. institutions and value chain actors, demand includes agricultural and non agricultural needs of smallholder farmers

Financial need is greatest for the “missing middle”¹, i.e., SMEs that serve smallholder farmers with capital needs between \$50K and \$1M USD

Illustrative representation of the state of the market in 2018²

Loan size, USD

ILLUSTRATIVE EXAMPLE⁴



Commercial banks:

- Typically lend from \$1M and above
- Usually require fixed asset collateral

Social lenders:

- Lending from \$100K - \$2M,
- Extending beyond commercial banks to reach a portion of the missing middle
- Often provide unsecured lending tied to seasonal production in absence of formal collateral

Microfinance Institutions³:

- Lend at a very small ticket size
- Moving towards higher loan sizes while remaining well under \$50k

This illustrative representation only refers to agricultural SMEs. An important financing gap also exists in direct financing for individual smallholder farmers.

(1) The Elephant in the Room: Financial Inclusion for the Missing Middle, 2015

(2) Graphic courtesy of CSAF

(3) Initiative for Smallholder Finance, “A Roadmap For Growth: Positioning Local Banks For Success In Smallholder Finance,” 2013

(4) Illustrative diagram courtesy of CSAF

This study helps bridge the knowledge gap on the financial performance of actors lending at the frontier of the “missing middle”

- **While research is available on smallholder farmers financial needs, studies of agricultural SME demand are insufficient.** The five categories of lenders that address some of the smallholder farmers’ needs are:
 - Value chain actors that provide in-kind services or short-term cash advances based on their relationships with farmers
 - Microfinance institutions that traditionally provide non-agri group lending and savings (and have recently moved into short-term agriculture lending)
 - State banks that provide a high proportion of savings accounts and short term lending, but have very different funding and cost structures from those of private entities, and have very limited presence (if any) in Africa
 - Commercial banks that provide very small loans at high interest rates as well as larger loans requiring fixed asset guarantees; they rarely serve the most vulnerable parts of the markets
 - Impact investors and non-bank financial institutions, including social lenders and local finance companies specializing in agri-SMEs, providing tailored financial services to an important array of underserved markets segments
- **Most existing studies do not focus on the specific challenges of lenders (social or otherwise) covering the “missing middle”,** and quantitative assessments of lending performance are even fewer. Getting an in-depth understanding of the true challenges of lending to agricultural SMEs with capital needs between \$50K and \$1M requires detailed performance data, which is limited given its sensitive nature, and the small pool of actors. A first step towards uncovering the financing gap, was taken in 2016 with Initiative for Smallholder Finance report, “Inflection Point: Unlocking growth in the era of farmer finance”. This reports builds on it further, utilizing the same approach to segmentation, choice of assumptions, and recommendations for this financial benchmarking exercise.
- **For this report, Dalberg built a unique, first-of-its-kind, database of loan-level profitability data to assess the ‘true cost’ of lending** to agri-SMEs within different segments. From the analyses, Dalberg assessed the relative risk associated with each segment, and illustrated potential funding mechanisms for donors to help address the gaps. The results refine previous analyses and confirm some of the broader tendencies observed in the market.

This engagement helps to better understand actual financial performance of CSAF organizations, whether there is a need for a blended finance facility and in what situations such a facility might be deployed most useful.

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Dalberg designed a two-phase study to determine the ‘true cost’ of SME lending in agriculture and analyze its profitability drivers

Phase 1

A financial benchmarking analysis of the portfolios of the Council of Smallholder Agricultural Financing (CSAF)¹ lenders to assess the cost to serve different SME segments. We analyzed:

- Revenue of loans, in terms of interest income and fees
- Financial risk of write-offs
- Operating costs, including one-time and ongoing, direct and indirect costs

Based on the findings of Phase 1, funded by USAID, we identified drivers of margins, cost, and risk, as well as potential opportunities for donor interventions

Phase 2

Phase 2 will replicate the Phase 1 financial benchmarking analysis for 8-10 local lenders, including banks and non-bank financial institutions in East Africa to develop a comprehensive view on lending economics and compare with CSAF findings. Additional analyses on the research agenda also include:

- Customer lifetime value in agri-lending: enterprise growth and lender economics of long-term lending relationships
- Technical assistance: costs and benefits of technical assistance to agri-SME lending
- CSAF additionality analysis: mapping CSAF lending to local lenders

Dalberg analyzed the financial data of ~3.6k loan transactions from nine CSAF lenders in Phase 1 to benchmark performance in agricultural SME lending

Collect data

- Dalberg surveyed nine CSAF lenders to gather the following data on their agriculture lending portfolio from 2010-2017 in three areas:
 - Loan-level time series data: schedule of loan disbursements and repayments, including fees, interest, and credit losses
 - Portfolio breakdown of loan characteristics: borrower details such as country, value chain, facility type, etc.
 - Operating cost data: annual cost data by region / business unit where possible, including compensation, legal and professional fees, back-office resources, and other overheads

Standardize

- Dalberg cleansed the loan data to arrive at 3,556 in-scope loans, categorizing value chains, facility types, etc.
- A weighting factor (dollar duration) was utilized to allow a like-for-like comparisons of profitability drivers
- The total annual operating costs were divided across the originated and active portfolio for each year, and allocated across the stages of the loan lifecycle
- Dalberg validated initial loan analyses as well as cost allocations with each lender through bilateral conversations, surveys, and other validation exercises

Analyze

- Using the cleaned, standardized data, Dalberg determined the financial profit and accounting profit for each of the loans provided by the CSAF lenders
- Dalberg also calculated the cost of funds using for an impact-oriented lender at an average of 3% p.a. (based on discussion with CSAF lenders) to determine the income net of an impact-oriented cost of funds
- This resulted in unique and anonymized database that allowed analyses of the lending economics for serving agriculture SMEs across the variety of parameters and segments collected on the portfolio

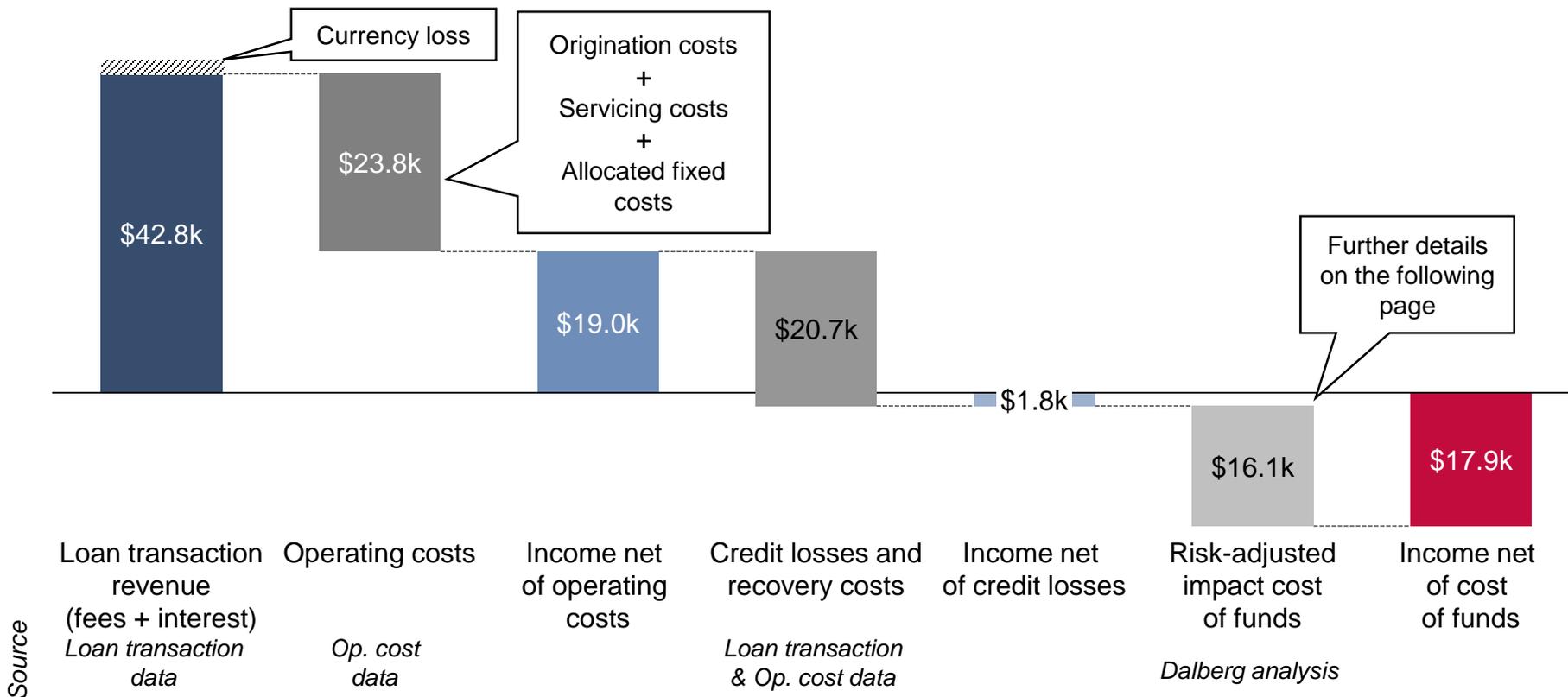
Further details of the methodology can be found in the appendix, page 67-73

The resulting data was broken down to determine net-profit for an average loan in the CSAF dataset, and later analyzed within different segments

Loan economics averages for all CSAF loans analyzed¹

USD thousands

Average loan size: ~\$665,000



Based on this breakdown we have analyzed drivers of profitability variation across different segments

We use an 'impact cost of funds' based on the below-market capital that the CSAF lenders raise to serve frontier markets

In order to account for the cost borne by a lender to raise capital, the profitability analysis required an assumption on the average cost of funds. There were three potential scenarios by which Dalberg considered to determine the cost of funds given the nature of the lenders and profile of the borrowers (the impact of each illustrated on the right):

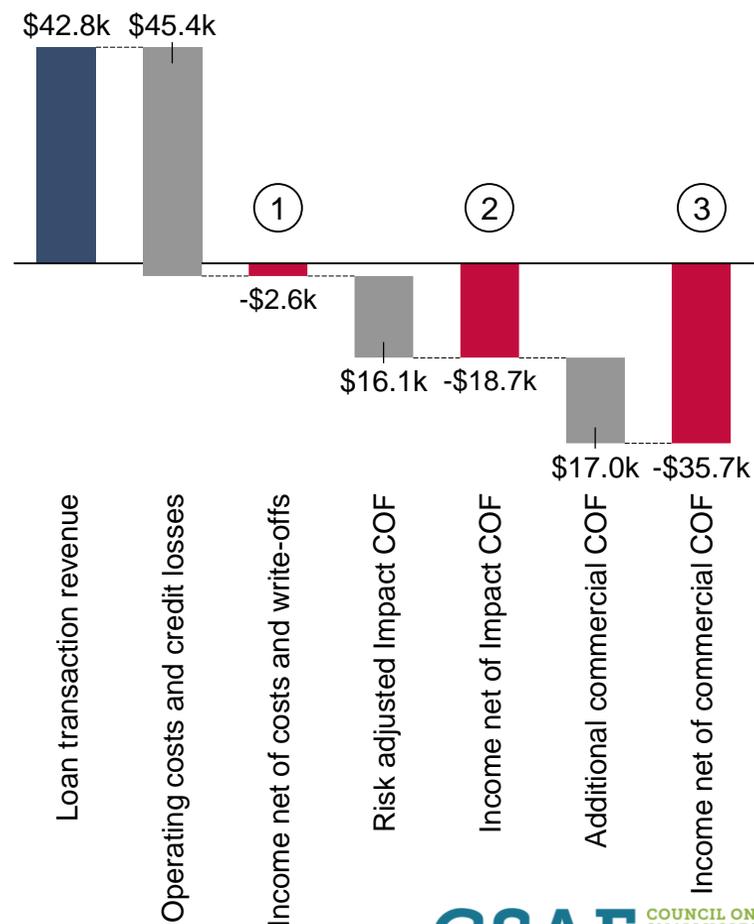
- ① Ignore cost of funds altogether and focus on operational profits
- ② Assume an 'impact' cost of funds (~3% p.a.) to reflect the below-market capital that social lenders, such as the CSAF lenders, would access from impact investors
- ③ Assume a commercial cost of funds (~6% p.a.) to reflect the costs any lender operating within commercial markets would incur

Dalberg chose to focus on impact cost of funds, and took two main steps to estimate it:

- **Dalberg set average cost of funds at 3% p.a.** based on discussions with CSAF lenders
- **This average was risk adjusted on a loan-by-loan basis** based on the profile of each loan (e.g., region) and sample averages

Used for analysis in this report

Loan economics averages for all CSAF loans analyzed
 USD thousands
 Average loan size: ~\$665,000



For purposes of this report, we have defined simplified segments and used other standardization metrics to best illustrate the underlying patterns

Segment definitions

- S/Saharan Africa vs. other regions**
 - S/Saharan Africa:** Loans disbursed to borrowers in sub-Saharan African countries
 - Other regions:** Loans disbursed in all other countries in Latin America and Asia
- Small vs. large loan sizes**
 - Small loans:** Loan sizes of less than \$500,000
 - Large loans:** Loan sizes of greater than \$500,000
- New vs. existing borrower**
 - New borrower:** Loans disbursed to a borrower borrowing from the lender for the first-time
 - Existing borrower:** Loans disbursed to borrowers who have borrowed from the lender before
- Loose vs. tight value chains¹**
 - Loose value chains:** Loans in value chains other than coffee and cocoa
 - Tight value chains:** Loans in coffee or cocoa value chains
- Long-term vs. short-term**
 - Long-term loans:** Loans with tenors greater than 12 months
 - Short-term loans:** Loans with tenors lesser than 12 months

Additional analysis metrics²

- Duration (months)**
 - Average number of months that a given dollar of principal is outstanding
 - For example, \$1M loan being repaid in \$500k increments after 6 and 12 months has duration of 9 months
- Dollar-duration / Weighting factor (\$)**
 - Product of the duration (defined above) of the loan and the total amount disbursed
 - For example, any loan with a \$1 dollar-duration is equivalent to a loan of \$1 that is fully outstanding for exactly one year
- Annualized yield p.a. (% per \$ per year)**
 - The total amount of income as a proportion of the total dollar-duration of the portfolio. Income may be fees, interest, profit, or credit losses.
 - For example, fee income yield p.a. of 1% means that for every dollar that stays outstanding for a year, 1 cents will be received in fee income.

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- Sub-Saharan Africa vs. Rest of the World
- Small vs. large loan sizes
- New vs. existing borrowers
- Loose vs. tight value chains
- Long-term vs. short-term loans

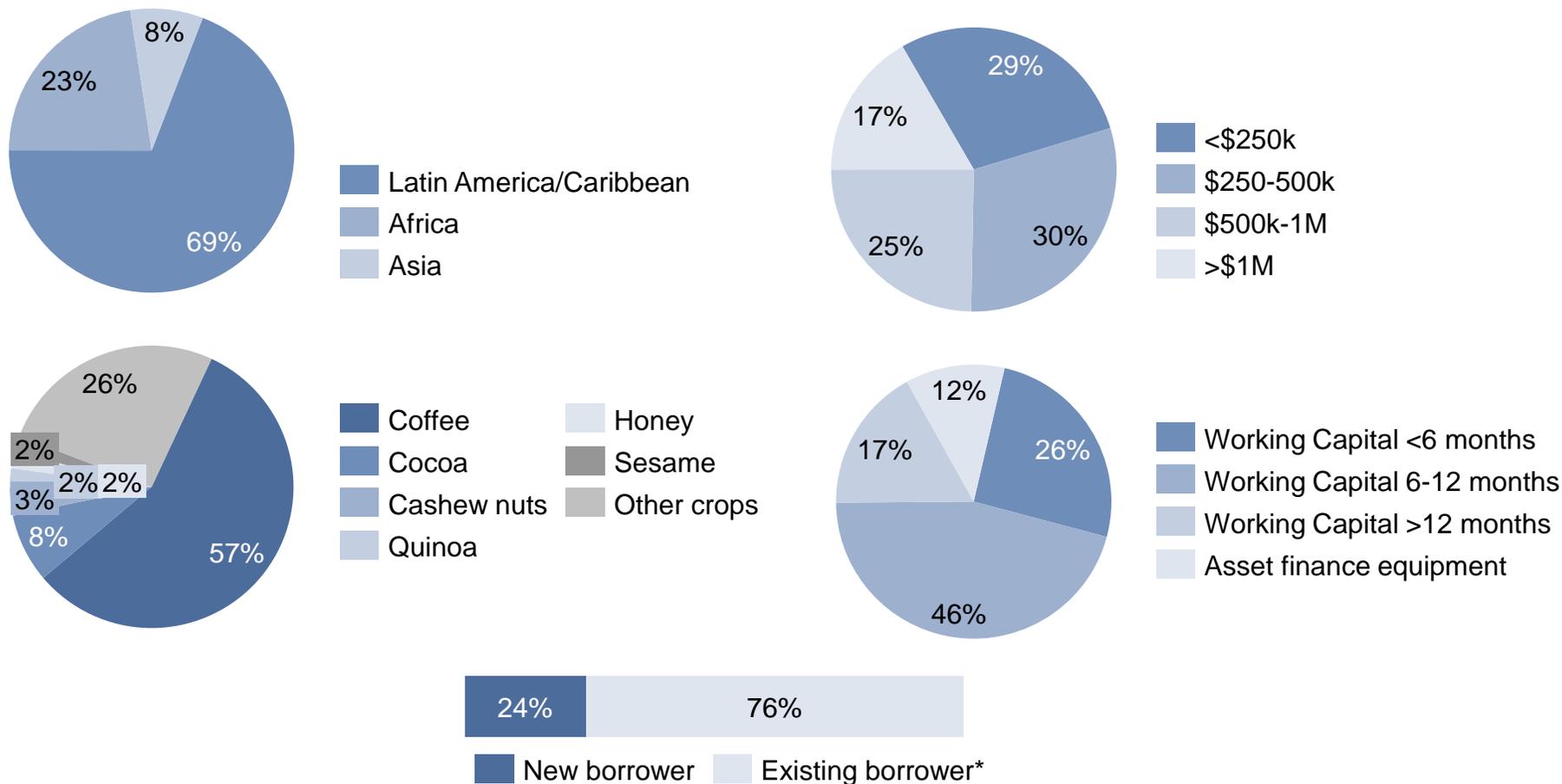
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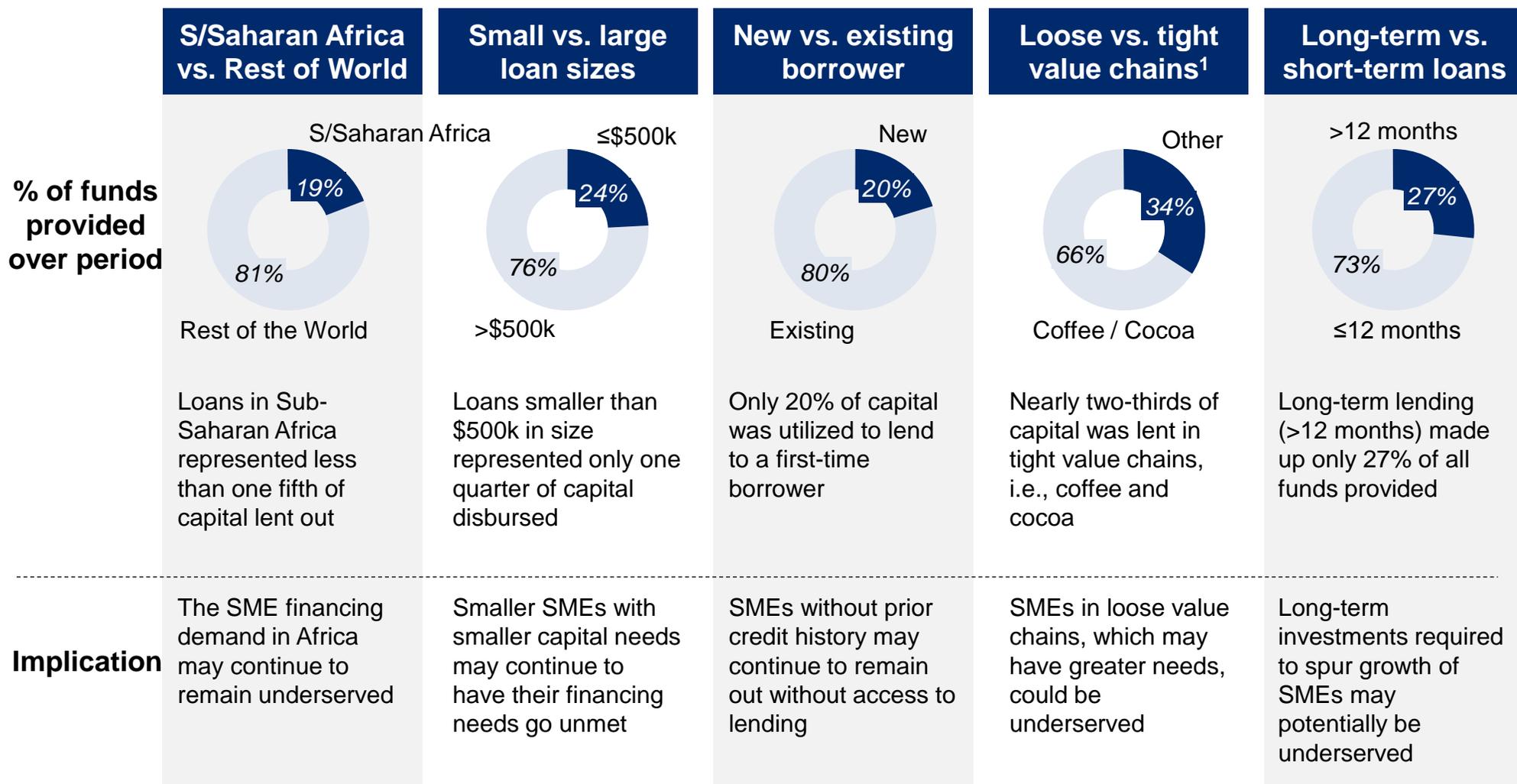
The largest share of loans analyzed were for working capital in Latin America in the coffee value chain to existing borrowers

Breakdown of all loans disbursed 2010-2016

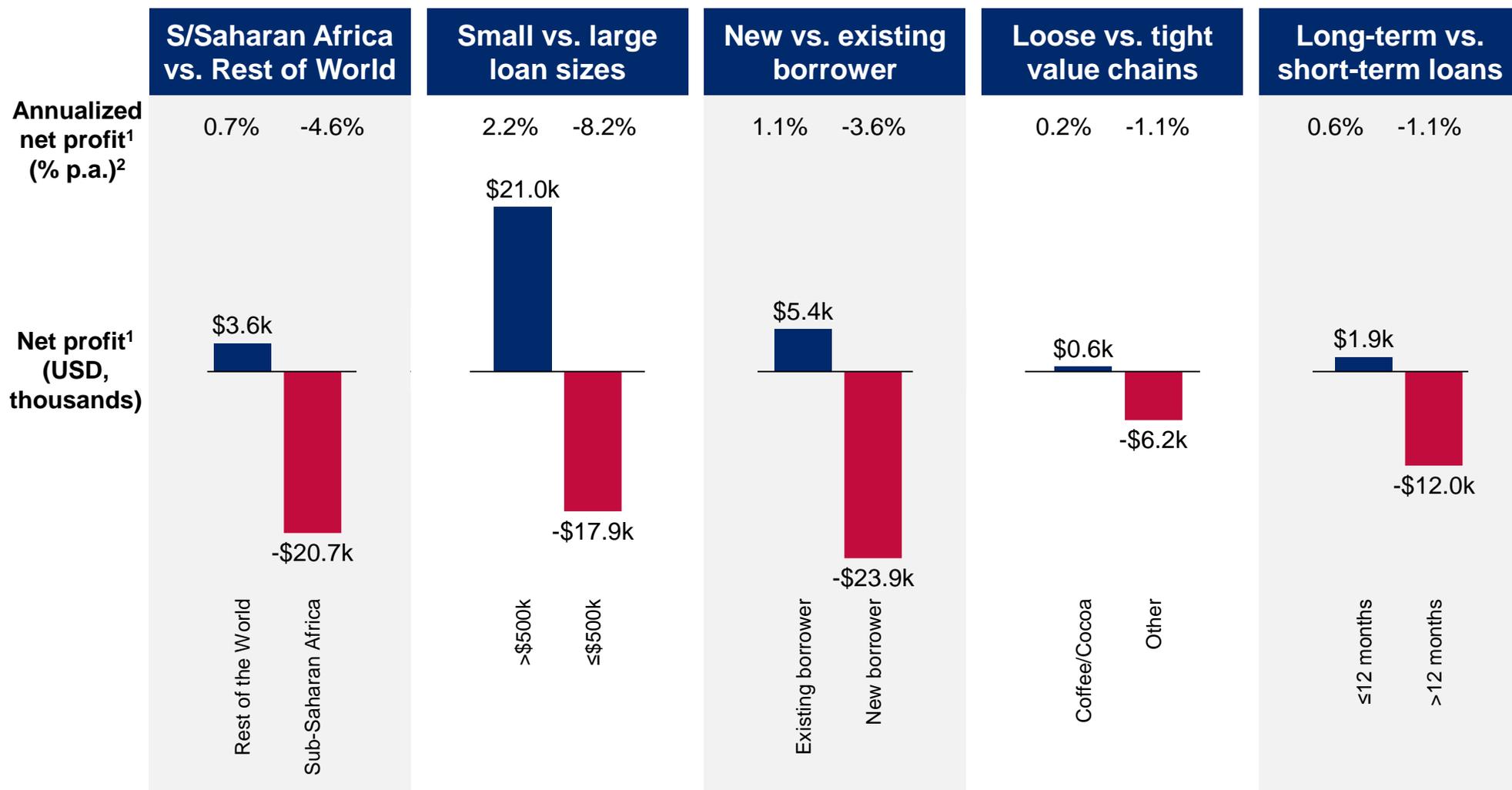
Percentage of loans, by region, loan size, value chain, financing product and new vs. existing borrower¹



The agriculture portfolio analyzed was clustered in certain segments



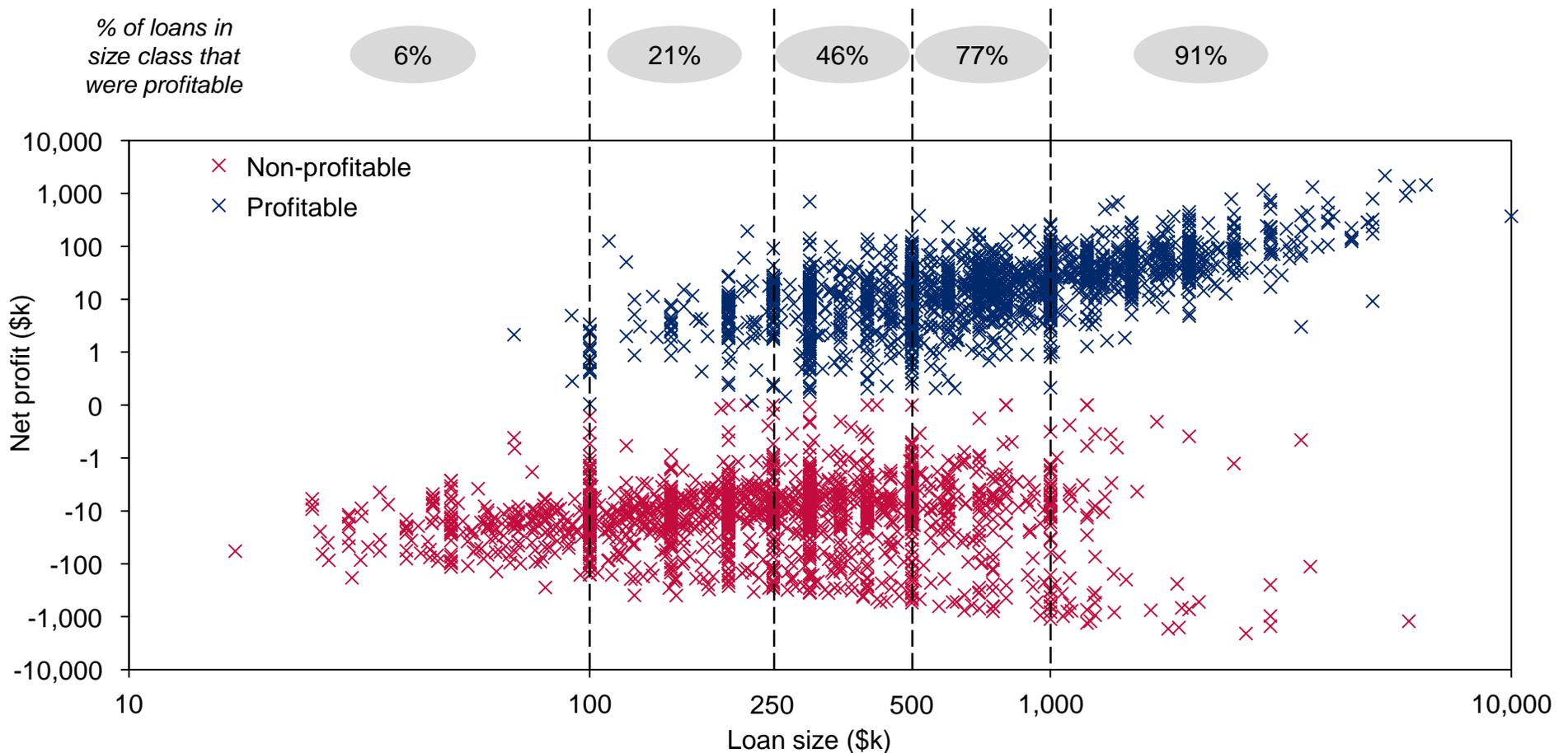
Each of the segments was found to correlate with higher profitability



Larger loan sizes tend to be more profitable across CSAF, and more than half of loans <\$500K would be loss-making even with zero-cost capital

Profitability

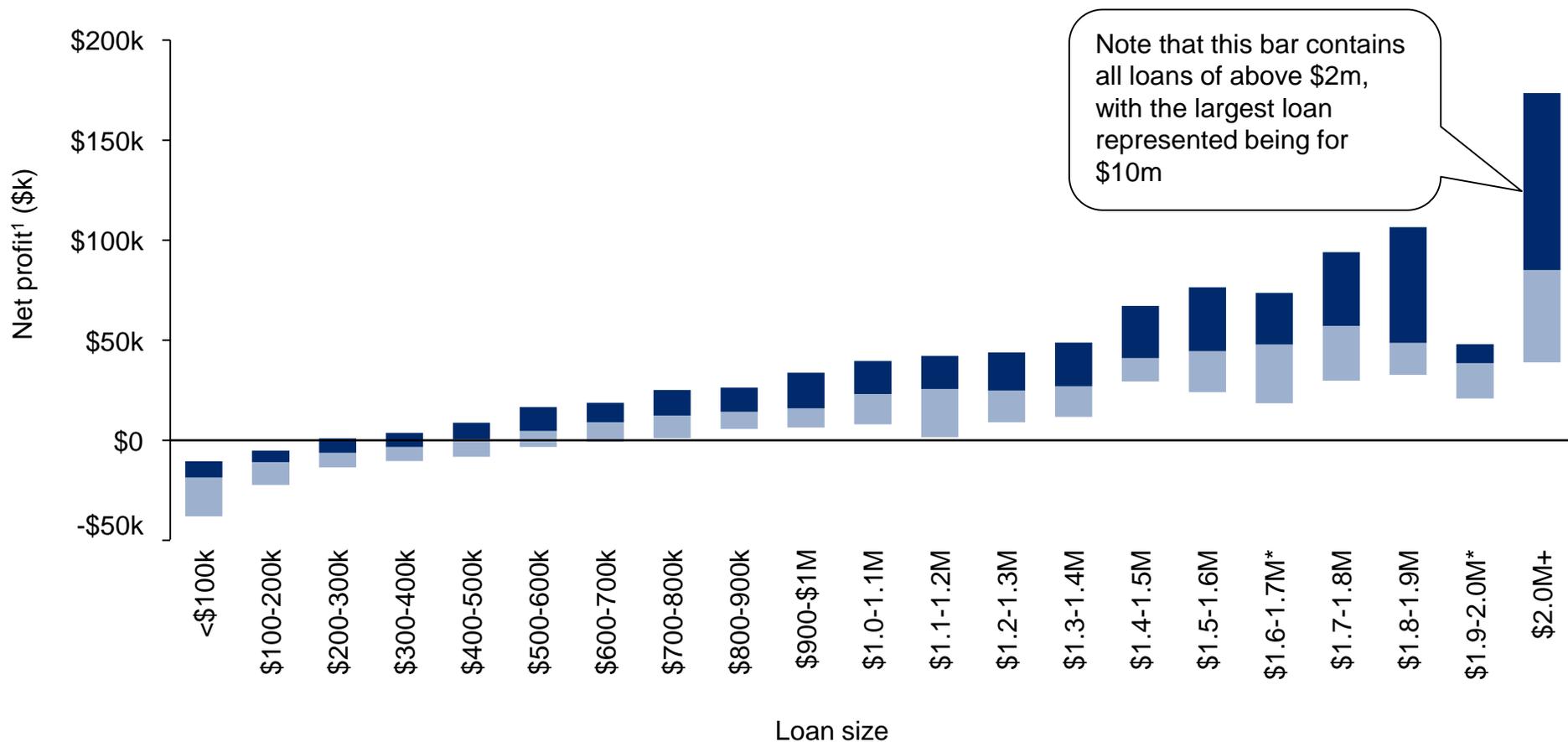
Net profit¹; percentage of loans in segment that are profitable (excluding cost of funds), by loan size (USD thousands, log scale)



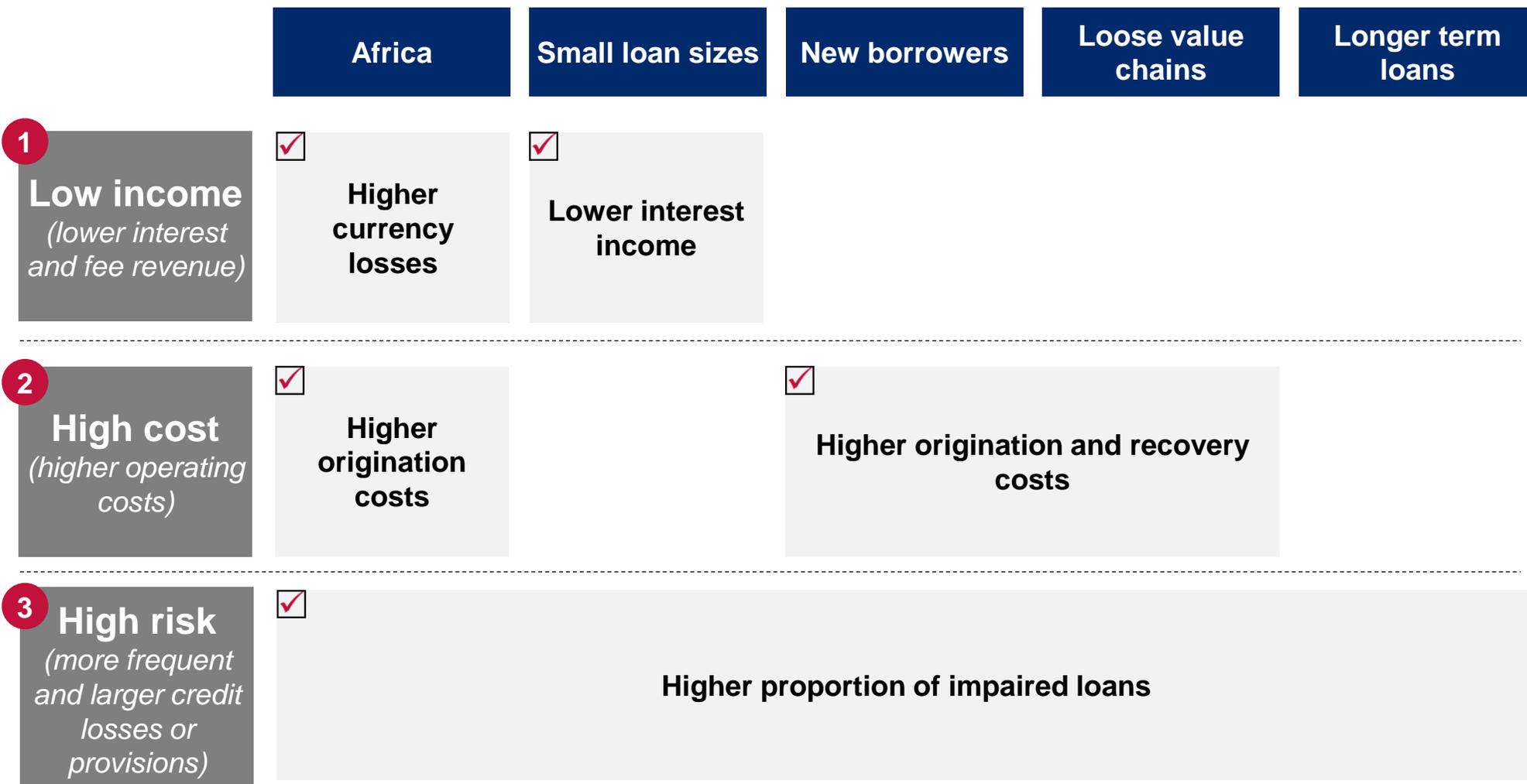
The trend in profitability with increasing loan size becomes more apparent breaking down the portfolio into segments of \$100k

Profitability

Net profit excluding cost of funds, by loan size (median; interquartile range; increments of USD 100,000)



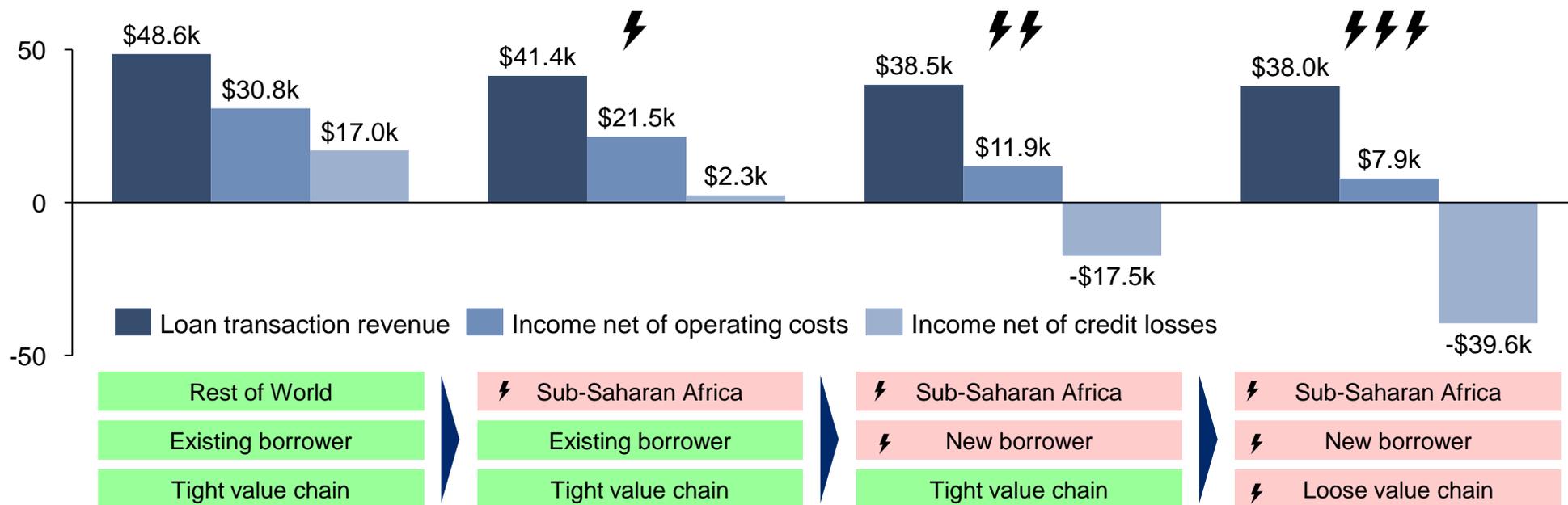
In summary, our analyses show that the following 'risky' segments were less profitable, due to three main issues



The impact of the risky segments compound and drive profitability further downwards

Average loan transaction revenue, income after operating costs, and income after credit losses
Assuming a 12-month fully-drawn loan of \$500k, in USD thousands

⚡ = 1 risk segment



# loans ¹	1,562	266	92	188
% of portfolio ¹	43%	7%	3%	5%
Avg. loan size	\$706k	\$767k	\$649k	\$326k

23% of loans in the CSAF portfolio fall into three or more risky segments; 49% have two or more

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- **Sub-Saharan Africa vs. Rest of the World**

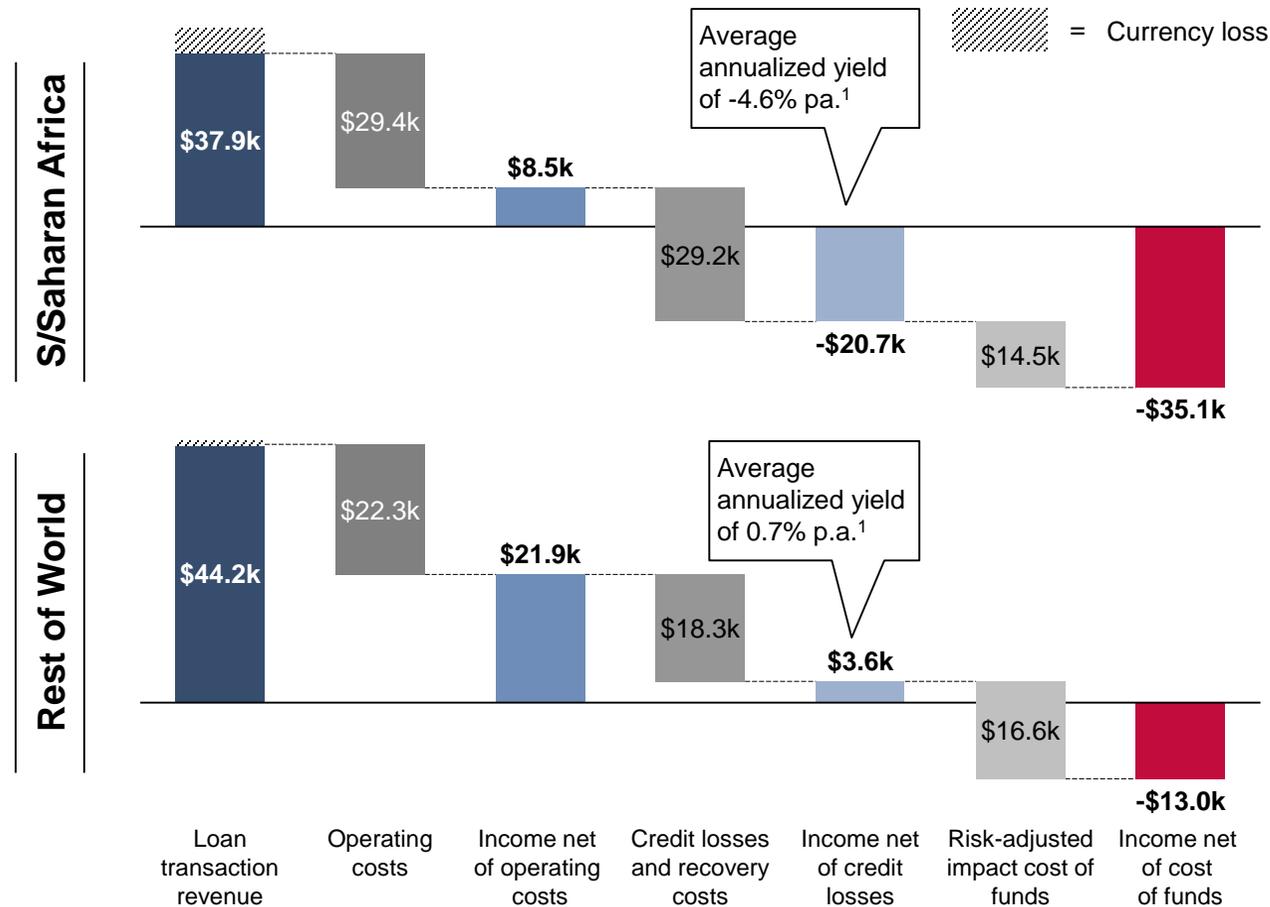
- Small vs. large loan sizes
- New vs. existing borrowers
- Loose vs. tight value chains
- Long-term vs. short-term loans

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Loans in Sub-Saharan Africa were less profitable than loans by CSAF members in the rest of the world

Loan economics averages for all CSAF loans analyzed by region
USD thousands



- Loans in regions outside of Sub-Saharan Africa were profitable net of credit losses (before including costs of funds), while loans in Sub-Saharan Africa were not
- The difference was driven by three key components:
 - Lower income from fees and interest
 - Higher operating costs
 - A greater amount of credit losses

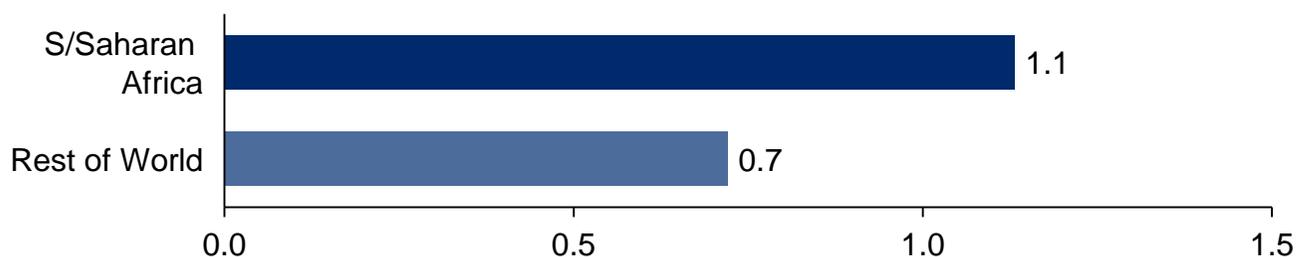
The difference in income was principally driven by greater currency losses and smaller ticket sizes in Sub-Saharan Africa

Average annualized interest income; Interest income less currency losses (%)



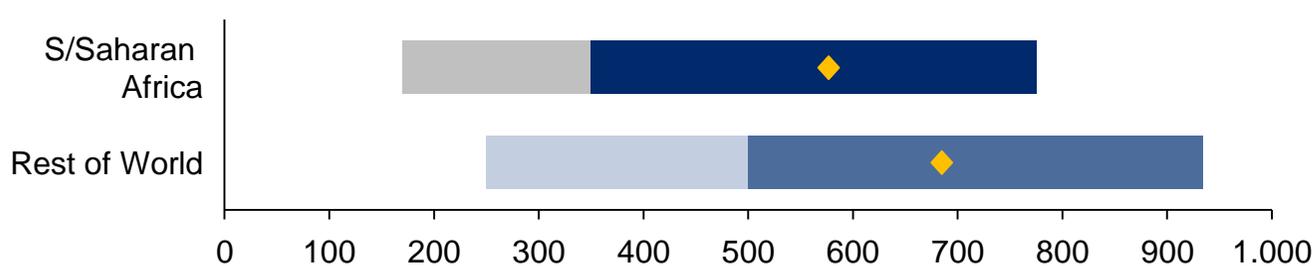
• While annualized interest income for Sub-Saharan Africa was higher than the CSAF average, currency losses of ~1.2% reduce the effective interest income to 7.2%, or 0.2 percentage points lower than the Rest of the World

Average annualized fee income; Fee income (%)



• However, this difference was partially compensated for by greater annualized fee income in Sub-Saharan Africa

Loan size; Median, interquartile range; \$000's

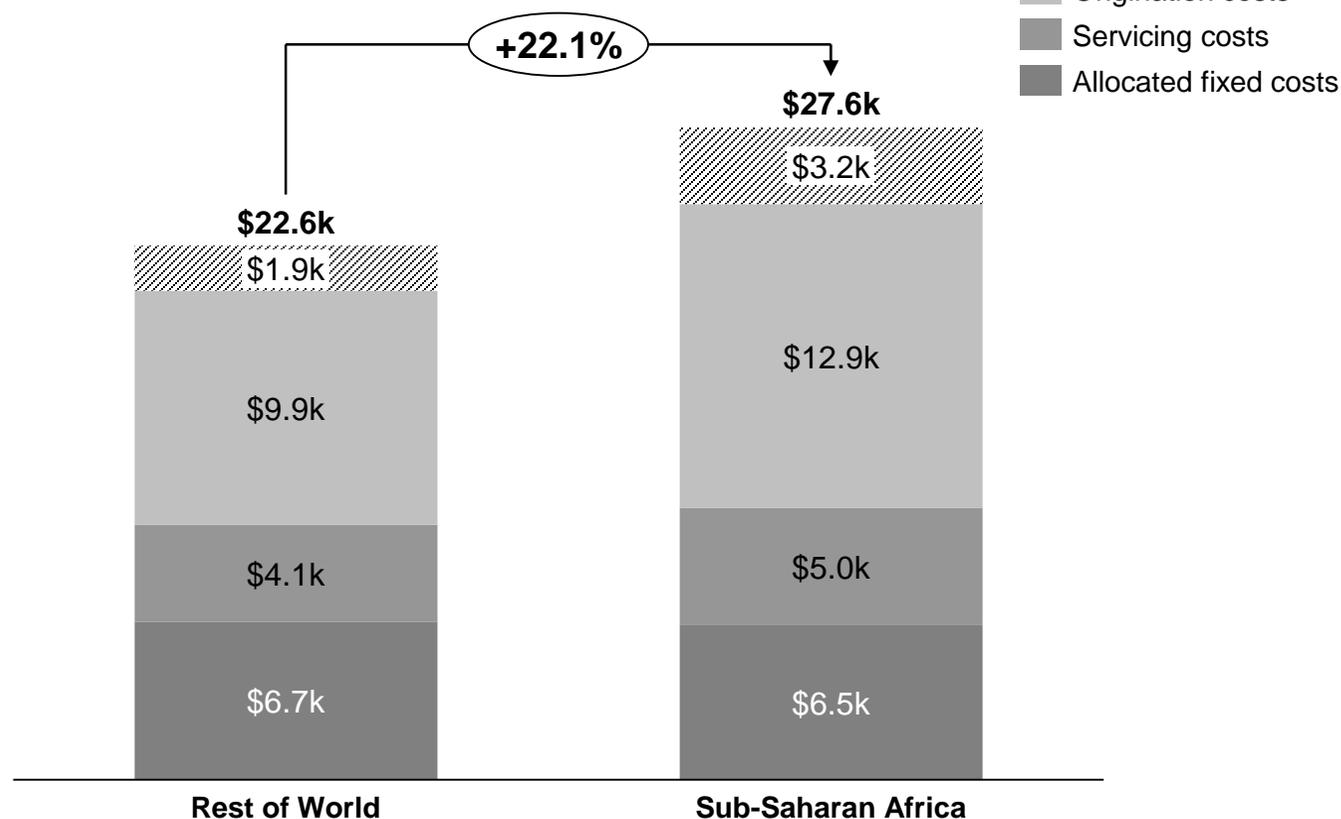


• As such, the principal driving factor for lower income in Sub-Saharan Africa was the smaller average loan sizes (median of \$350k vs. \$500k for Rest of the World)

Operating costs per loan, particularly origination costs, were higher in Sub-Saharan Africa than other regions

Operating expenses by region

Average cost per loan, standardized 12 months, USD

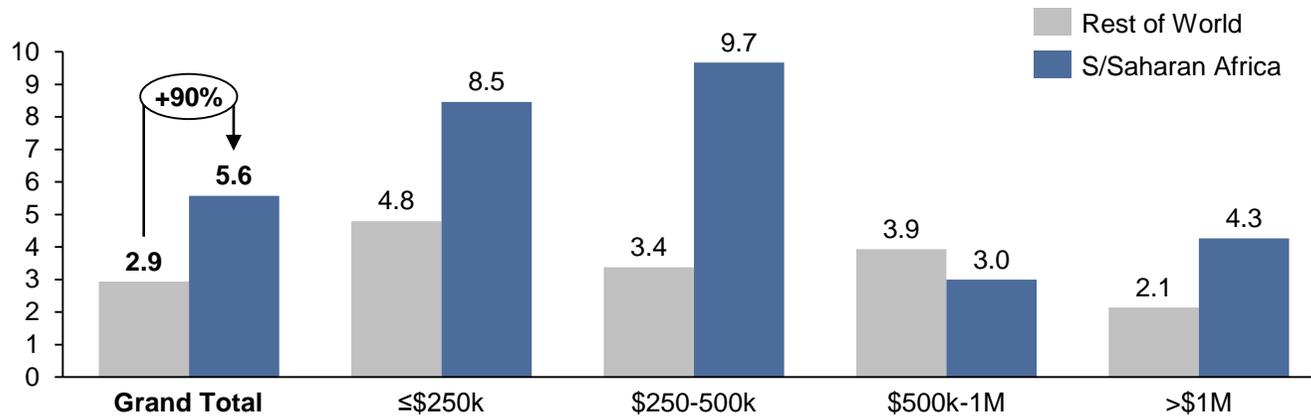


- Sub-Saharan Africa had the highest cost per loan amongst all regions, and was higher than the Rest of the World by 22%
- Despite standardizing tenors to 12 months, overhead and servicing cost were higher in Sub-Saharan Africa
- Part of the higher costs may relate to the higher proportion of first-time borrowers and loans in 'loose' value chains

Lending in Sub-Saharan Africa had greater annualized credit losses, principally driven by a higher number of impaired loans for CSAF lenders

Total credit losses

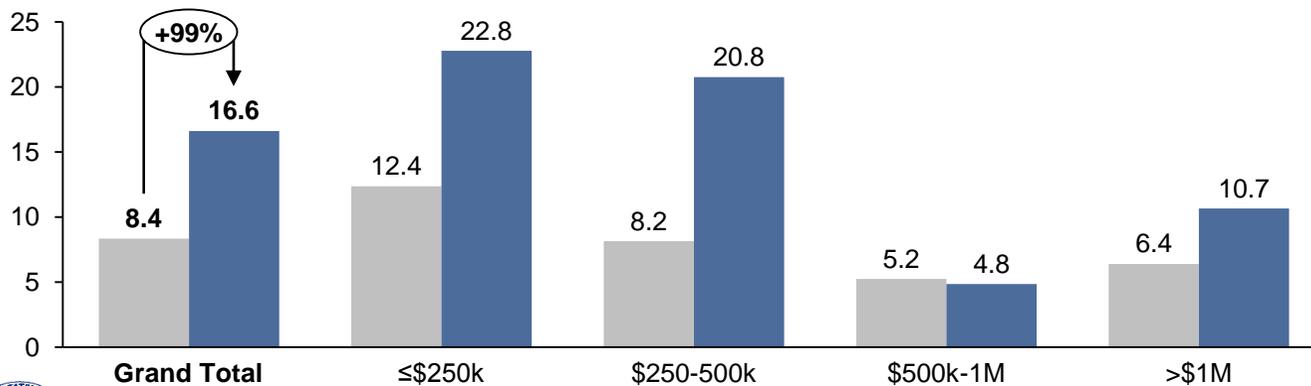
Credit loss (% p.a.), by loan size



- Credit losses were significantly higher in most loan size brackets in Sub-Saharan Africa
- Overall, annualized credit losses in Sub-Saharan Africa were 2.7 percentage points higher than for the Rest of the World

Impaired loans

Percentage of loans, by loan size



- The higher credit losses were principally driven by a higher percentage of impaired loans, rather than by a higher average value written-off per loan

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1. Introduction

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3. Key findings

- Sub-Saharan Africa vs. Rest of the World

- **Small vs. large loan sizes**

- New vs. existing borrowers

- Loose vs. tight value chains

- Long-term vs. short-term loans

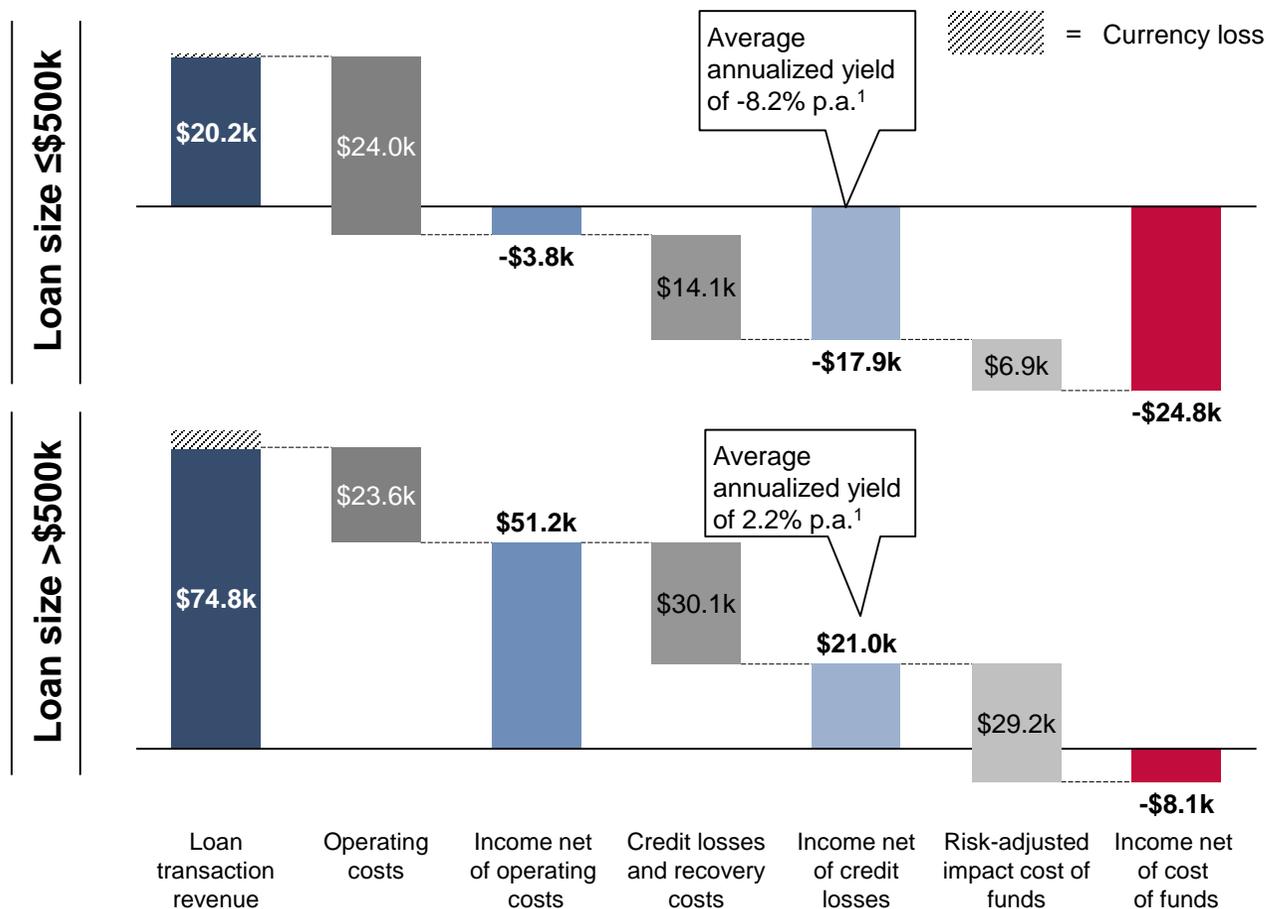
4. Implications

5. Appendix

Large loans were more profitable than small loans

Loan economics averages for all CSAF loans analyzed by loan size segments

USD thousands



- Loans >\$500k were profitable net of both operating costs and credit losses, whereas loans of ≤\$500k were not profitable net of operating costs
- The difference was principally driven by lower income from small loans, while operating costs remained the same, and credit losses were higher as a percentage of loan size
- Despite their more attractive economics, larger loans >\$500k were still not profitable after cost of funds

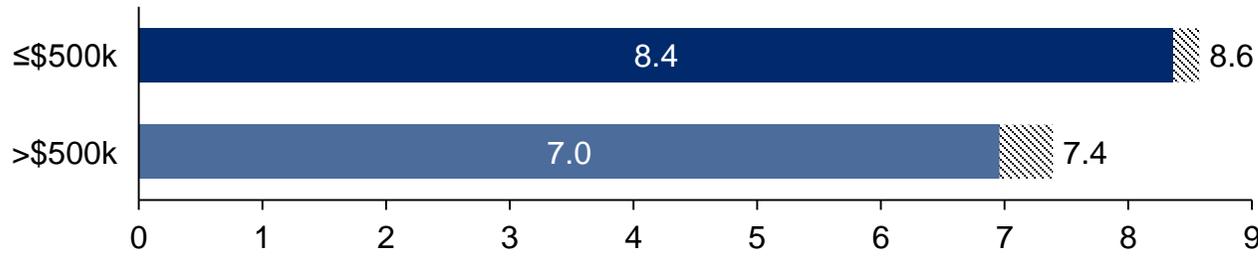
(1) For further details, see appendix, page 79

Note: (*) Impact cost of funds used is 3%

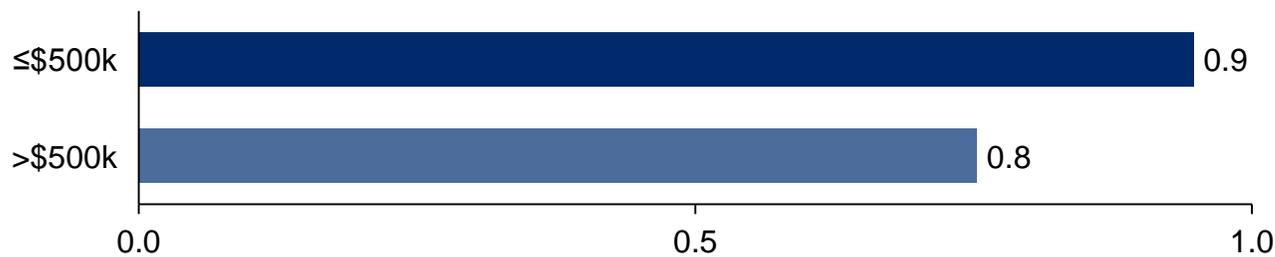
Source: CSAF lenders survey conducted between April – June, 2018 of 3,556 individual loan transactions

The difference in income was principally driven by the difference in loan sizes

Average annualized interest income; Interest income less currency losses (% p.a.)  Currency loss

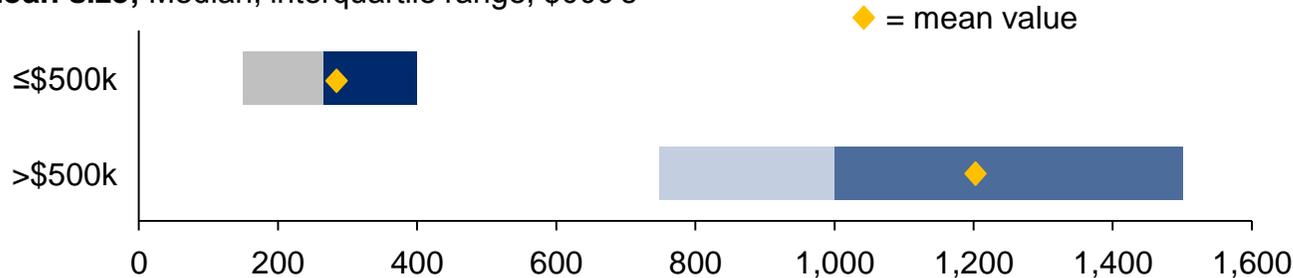


Average annualized fee income; Fee income (% p.a.)



- Annualized interest and annualized fee income were greater for small loans by 1.4 percentage points and 0.1 percentage points respectively after currency losses were accounted for

Loan size; Median, interquartile range; \$000's

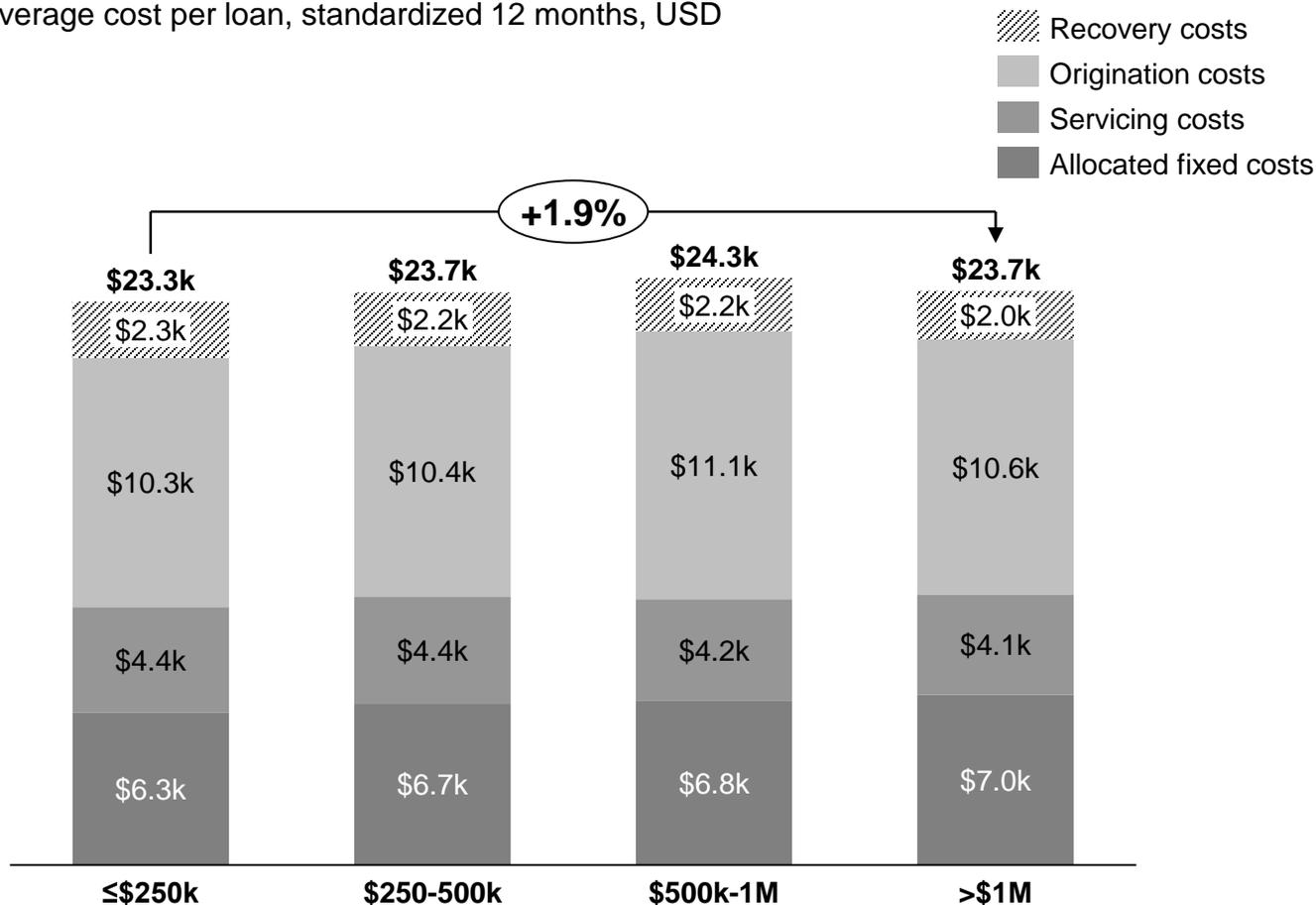


- The principal driving factor for lower income among small loans was the smaller ticket size (median of \$267k for smaller loans vs. \$1M for larger loans)

Operating costs per loan varied only slightly for loans of different sizes

Operating expenses for an existing by loan size segments

Average cost per loan, standardized 12 months, USD



- Even though revenue potential varied by loan size, the operating costs showed no significant variation (the slight variations may be a result of other characteristics of the loans)
- This results in smaller loans becoming less profitable than larger ones

Operating costs were largely fixed, while (interest) income depended on the outstanding balance, making small loans a difficult proposition

Months required to cover average operating costs from interest and fee revenue by loan size

Outstanding operating cost, not including recovery costs (months)

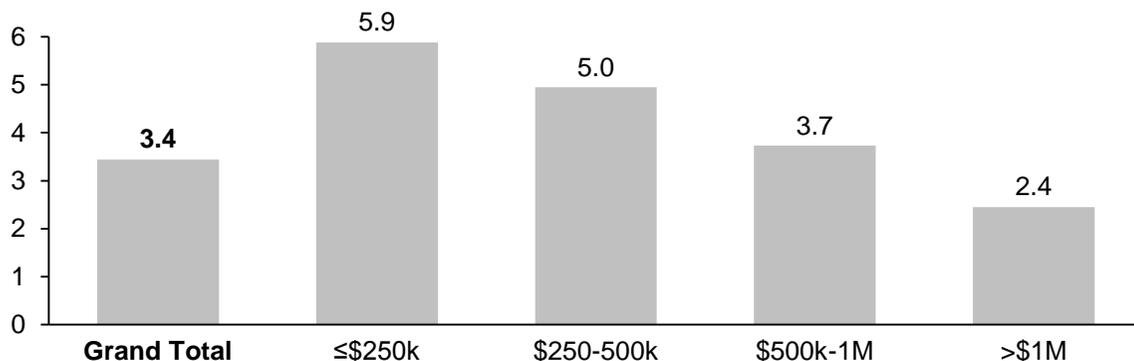
If you make a loan of...	On average only this amount is actually earning interest...	And origination fees will cover this amount of your operating costs...	So to break even, the loan needs to yield an income of...	With an average annualized interest income after currency losses of ...	To break even the loan must be outstanding for...
\$200k	\$120k	8.6%	\$22k	8.4%	16 months
\$750k	\$440k	21%	\$18k	7.6%	3.8 months
\$2,000k	\$1,100k	44%	\$14k	6.6%	1.2 months

The average tenor of CSAF loans is 14.7 months making it very difficult for small loans to be profitable even before credit losses or cost of funds are taken into consideration

Credit losses decreased as a percentage of loan size with larger loans

Total credit losses

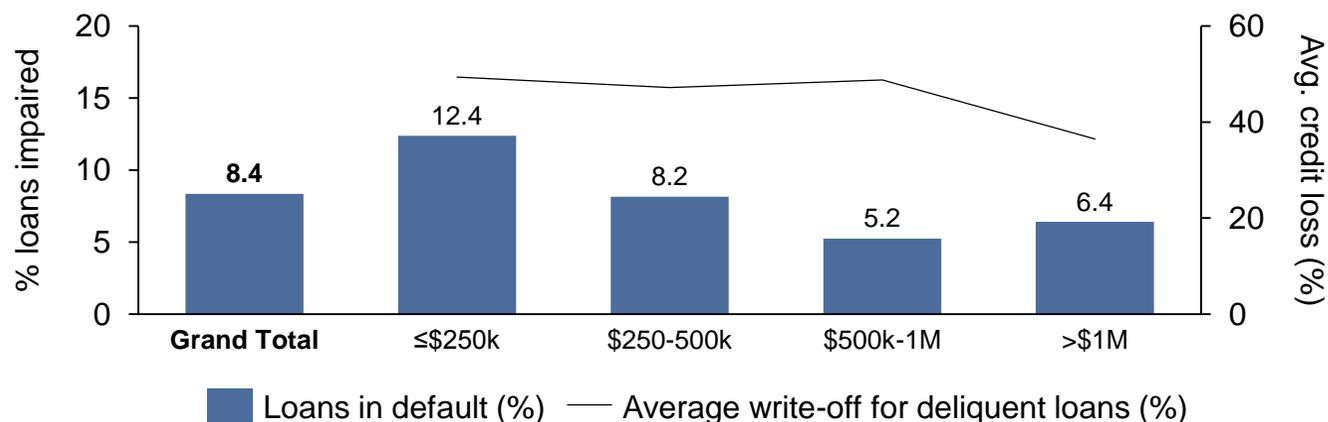
Credit loss (% p.a.), by loan size



- Credit losses decreased as loan size increased, with a total average credit loss of 3.4%
- Up to \$1M, decreasing credit losses were driven by a decrease in the number of delinquent loans

Impaired loans

% of loans impaired; average credit loss for impaired loans, by loan size



- Beyond \$1M there was a slight increase in the proportion of delinquent loans, but a simultaneous decrease in the percentage written-off

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1. Introduction

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- Sub-Saharan Africa vs. Rest of the World
- Small vs. large loan sizes

- **New vs. existing borrowers**

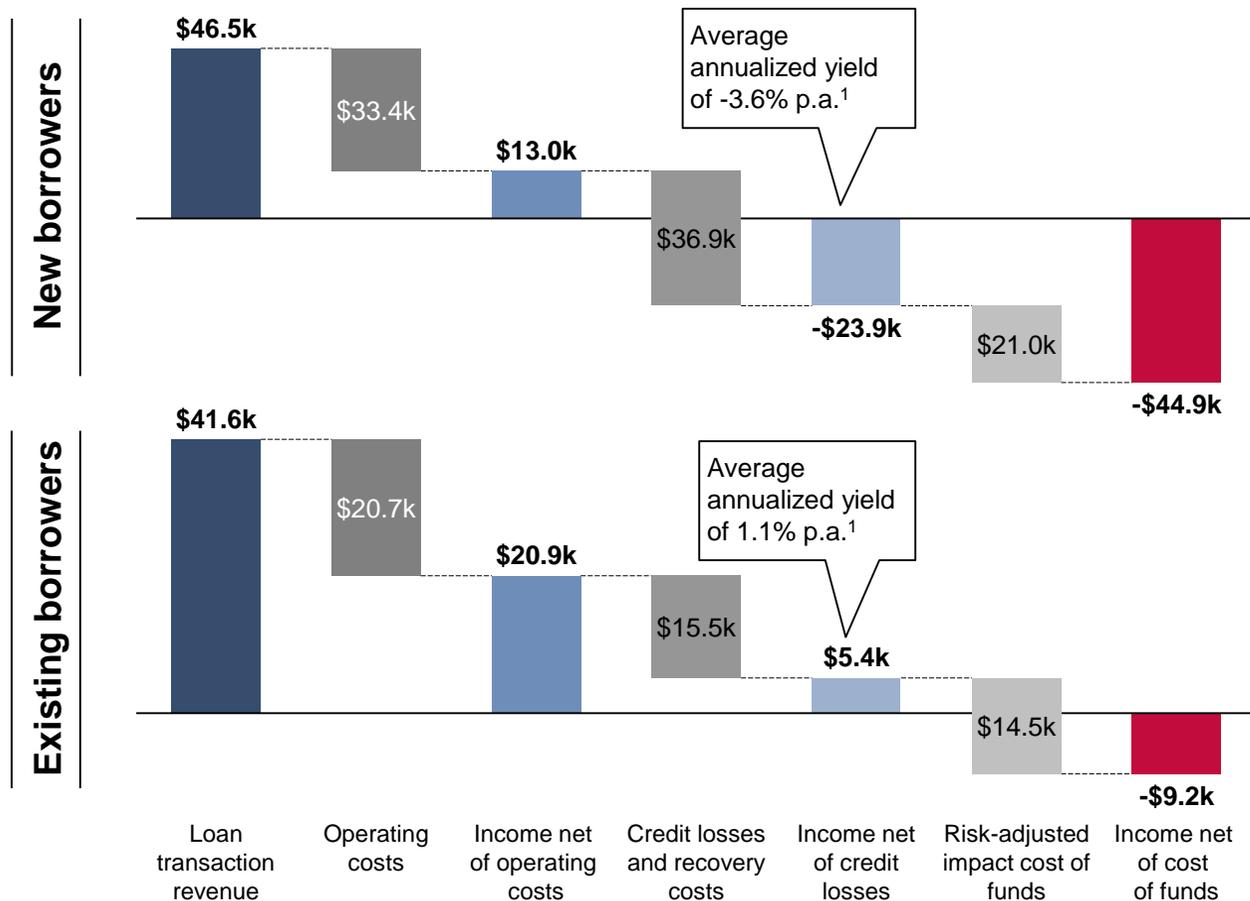
- Loose vs. tight value chains
- Long-term vs. short-term loans

4. Implications

5. Appendix

Existing borrowers were profitable net of credit losses and operating costs but not after cost of funds

Loan economics averages for all CSAF loans analyzed by borrower type
USD thousands



- Overall income was similar between new and existing borrowers
- Existing borrowers were 1.5x more profitable as new borrowers net of operating costs
- The key drivers of the difference in profitability were greater recovery costs and credit losses as well as higher operating costs for first-time borrowers

(1) For further details, see appendix, page 80

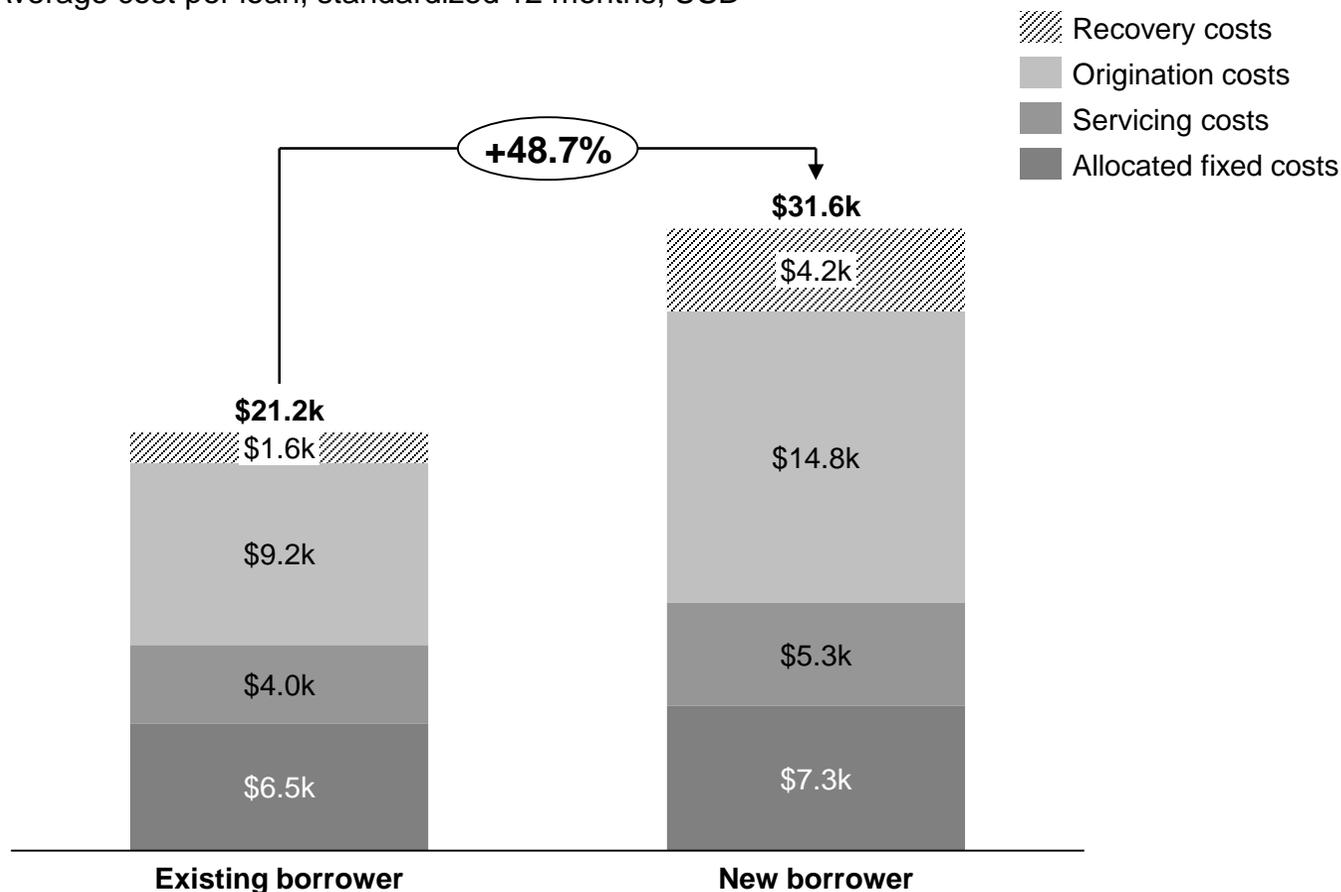
Note: (*) Impact cost of funds used is 3%

Source: CSAF lenders survey conducted between April – June, 2018 of 3,556 individual loan transactions

Lenders had higher origination costs for a new borrower compared to existing borrowers

Operating expenses for an existing borrower vs. a new borrower

Average cost per loan, standardized 12 months, USD

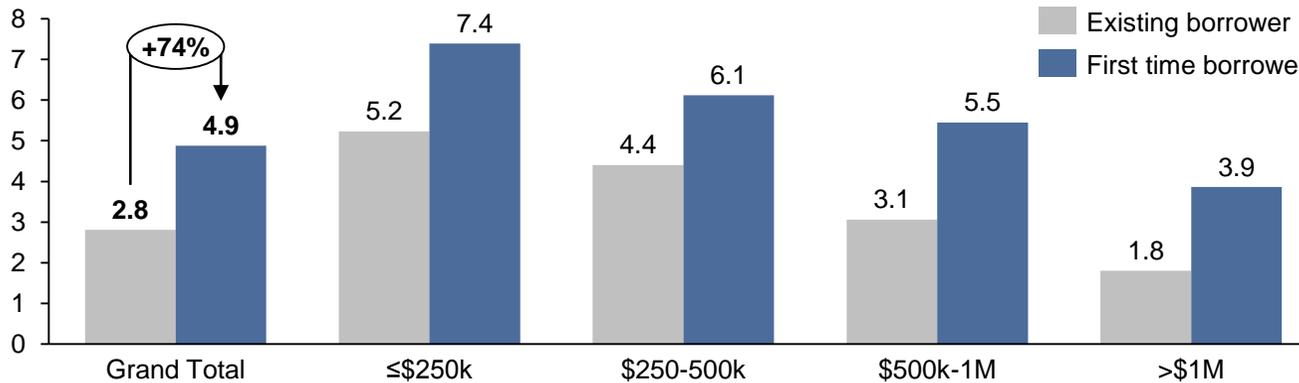


- A first-time borrower had nearly 50% higher costs than an existing borrower
- 7 out of 9 lenders reported higher origination costs for first-time borrowers of 1.5x on average
- The higher risk associated with a first-time borrower also had significantly higher recovery costs than an existing borrower

First-time borrowers had greater annualized credit losses, principally driven by a higher percentage of impaired loans

Total credit losses

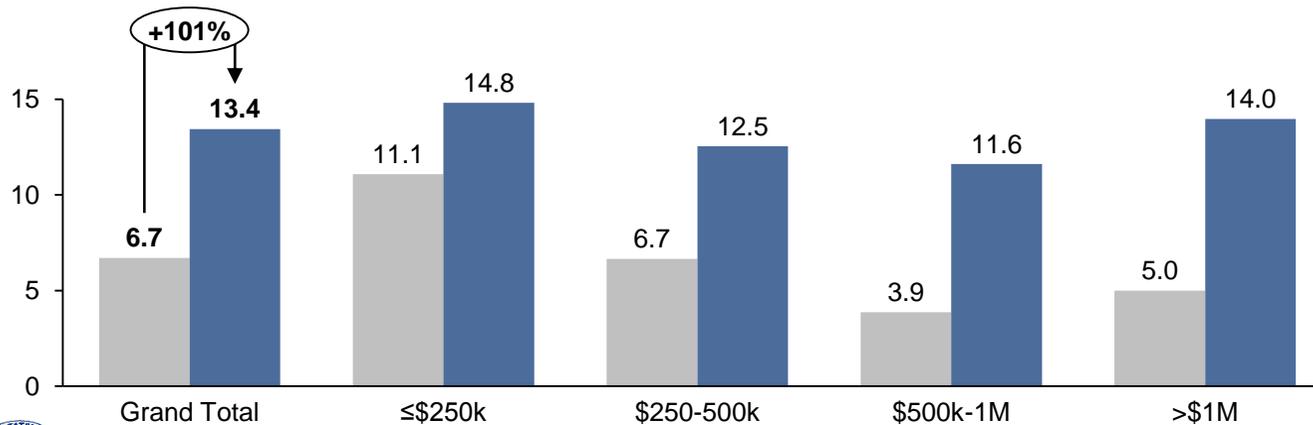
Credit loss (% p.a.), by loan size



- Credit losses were significantly higher in most loan size brackets among first time borrowers
- Overall, annualized credit losses among new borrowers were 74% higher than among existing borrowers

Impaired loans

Percentage of loans, by loan size



- The higher credit losses were principally driven by a higher percentage of impaired loans

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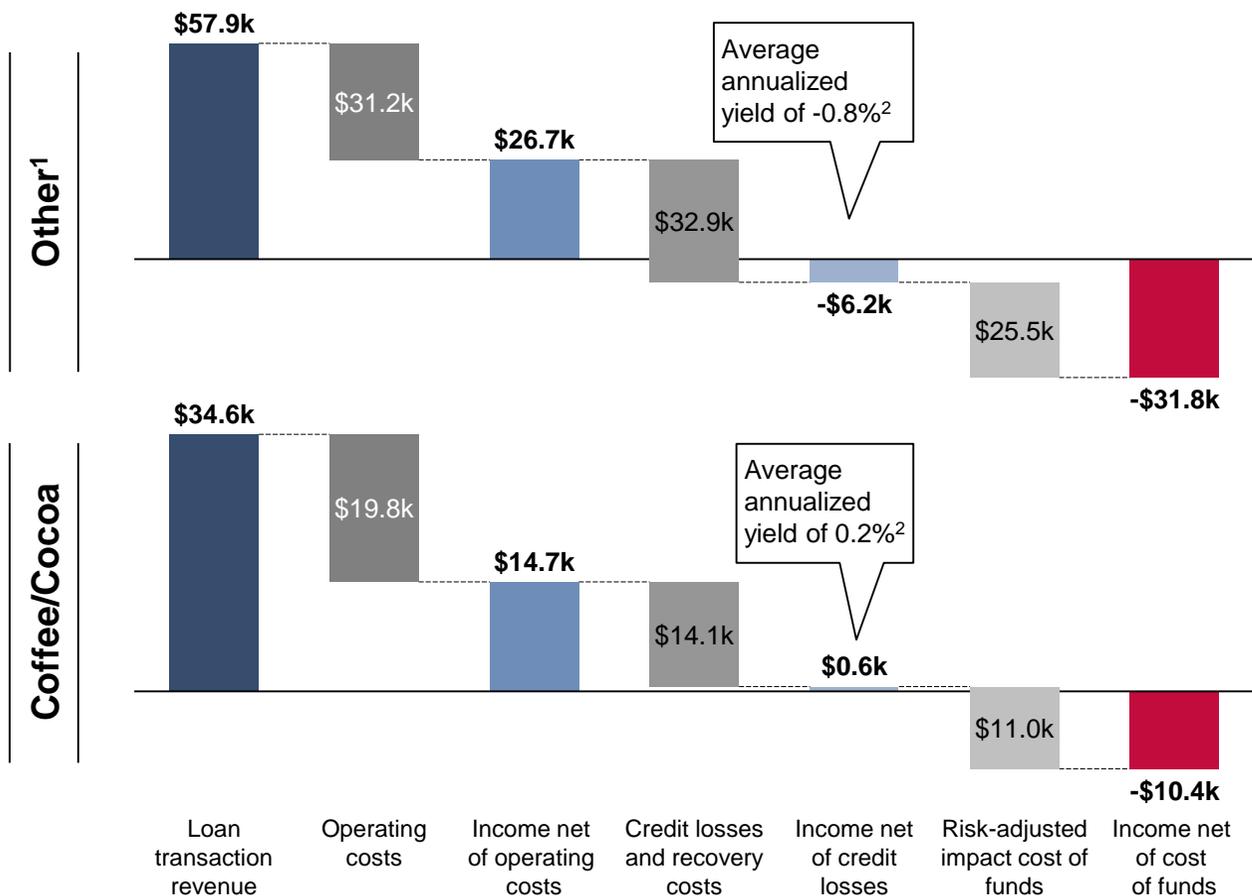
- Sub-Saharan Africa vs. Rest of the World
- Small vs. large loan sizes
- New vs. existing borrowers
- **Loose vs. tight value chains**
- Long-term vs. short-term loans

4. Implications

5. Appendix

Tight value chains were more profitable despite having lower fee and interest revenue than loose value chains

Loan economics averages for all CSAF loans analyzed by value chain group
USD thousands



- Loans to coffee and cocoa were profitable net of credit losses, while loans to loose value chains were not
- Coffee/Cocoa had lower income, but overall profitability was higher due to lower operating costs, and lower recoveries and credit losses
- Both segments made losses after cost of funds was taken into account

(1) Further details of profitability by additional value chains in appendix, page 66

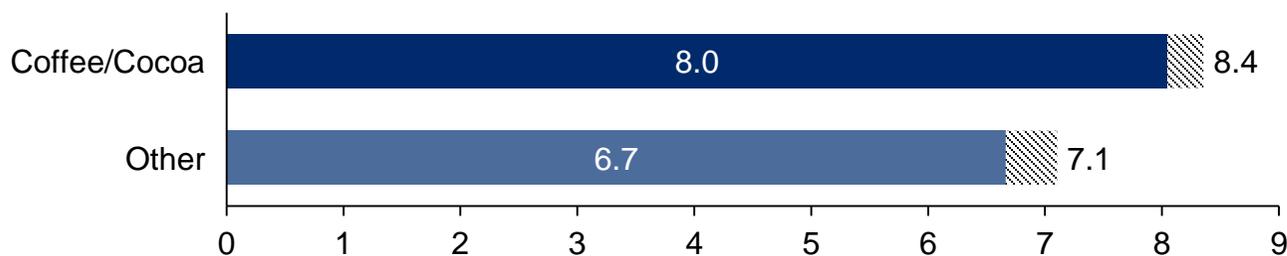
(2) For further details, see appendix, page 81

Note: (*) Impact cost of funds used is 3%

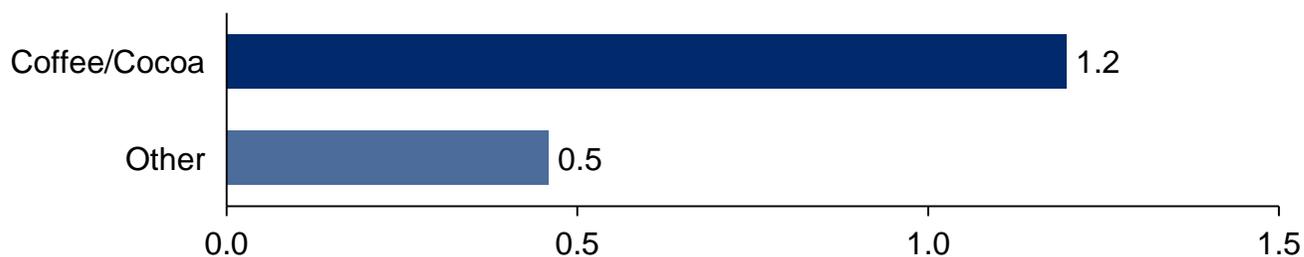
Source: CSAF lenders survey conducted between April – June, 2018 of 3,556 individual loan transactions

The difference in income was principally driven by the shorter tenor of loans in the coffee and cocoa value chain

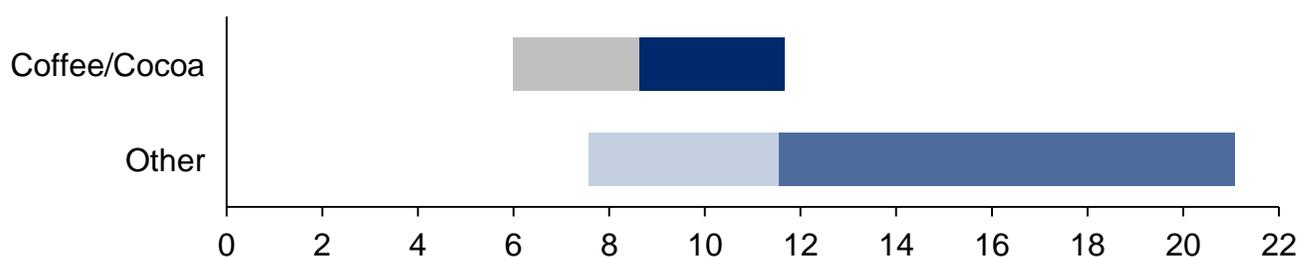
Average annualized interest income; Interest income less currency losses (% p.a.)  Currency loss



Average annualized fee income; Fee income (% p.a.)



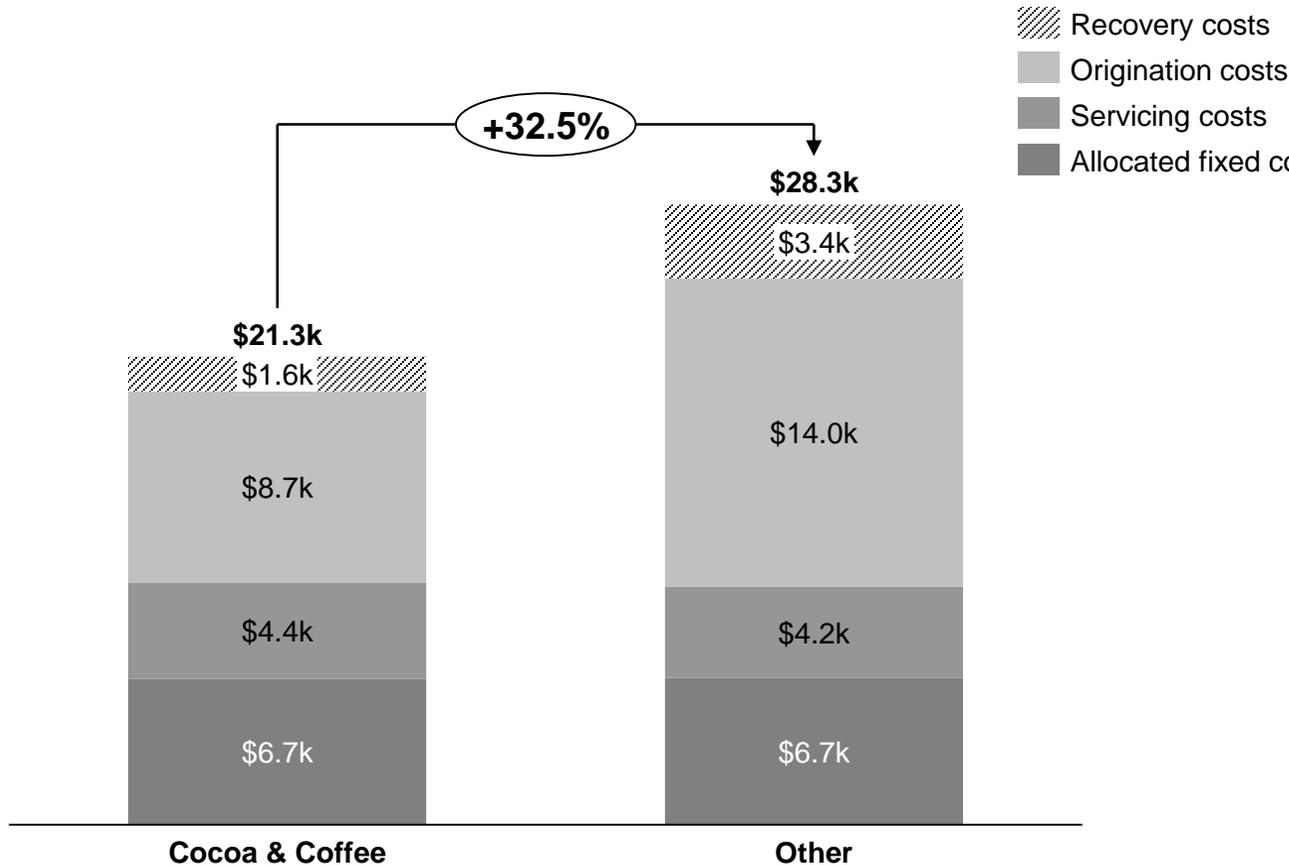
Tenor length; Median, interquartile range (months)



- Annualized interest and annualized fee income was greater for coffee/cocoa by 1.4 percentage points and 0.7 percentage points after currency losses were taken into account
- While loans for coffee/cocoa were slightly higher on average (median of \$500k vs \$420k for loose value chains) income was lower due to the shorter loan tenor

Lenders had higher origination and recovery costs for loans outside the coffee and cocoa value chains

Operating expenses for a coffee and cocoa vs. other value chains
Average cost per loan, standardized 12 months, USD

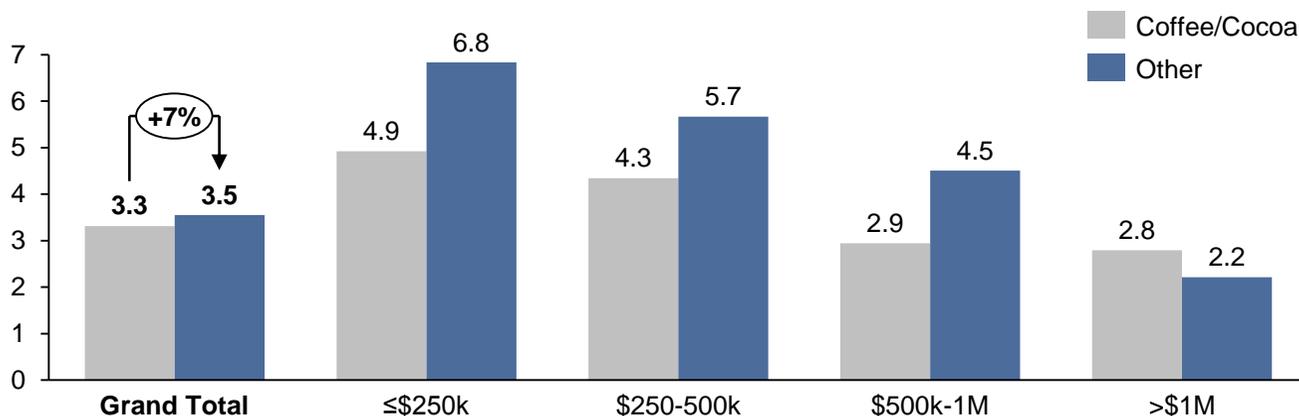


- Loans in the other value chains had over 30% higher costs than coffee and cocoa
- 5 out of 9 lenders reported higher origination costs for non-coffee and cocoa loans of an average of 1.5x
- The additional risk associated with loose value chains also has significantly higher recovery costs than an existing borrow
- This higher cost and risk may disincentivize lenders to lend in value chains other than coffee and cocoa

Higher credit losses outside of the coffee/cocoa value chain were driven by a higher proportion of impaired loans

Total credit losses

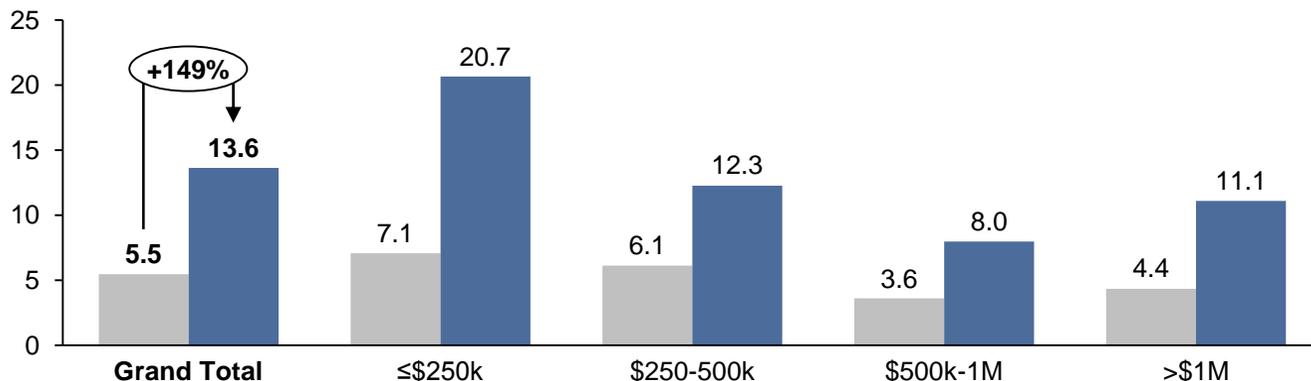
Credit loss (% p.a.), by loan size



- Credit losses were higher outside of the coffee and cocoa value chains among all loan brackets apart from loans of greater than \$1M
- Overall, annualized credit losses were 0.2 percentage points higher than in the coffee/cocoa value chain

Impaired loans

Percentage of loans (%), by loan size



- The higher credit losses were driven by a higher percentage of impaired loans for loan sizes up to \$1M

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- Sub-Saharan Africa vs. Rest of the World
- Small vs. large loan sizes
- New vs. existing borrowers
- Loose vs. tight value chains
- **Long-term vs. short-term loans**

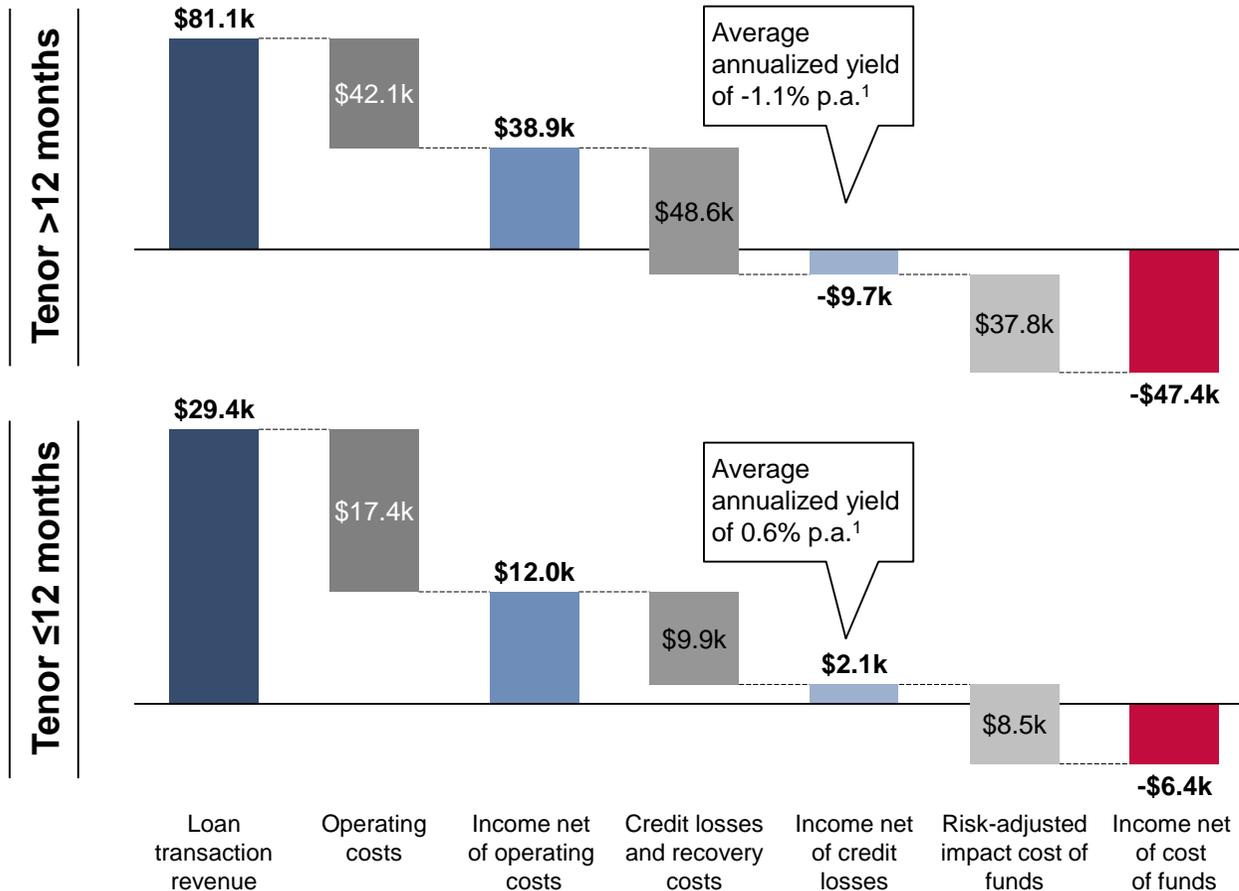
4. Implications

5. Appendix

Short-term loans were more profitable than long-term loans net of credit losses, though not after cost of funds

Loan economics averages for all CSAF loans analyzed by tenor segments

USD thousands



- Loans with up to 12-month tenors were profitable net of credit losses whereas longer term loans were not
- The difference in profitability was driven by lower income among short-term loans, as well as higher operating, credit loss and recovery costs

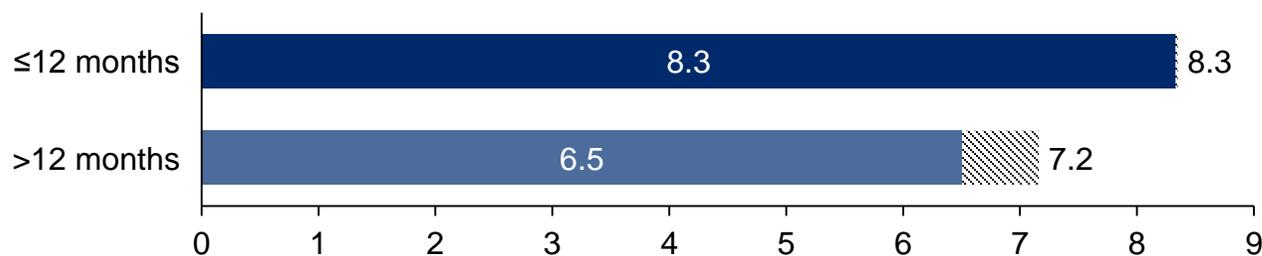
(1) For further details, see appendix, page 82

Note: (*) Impact cost of funds used is 3%

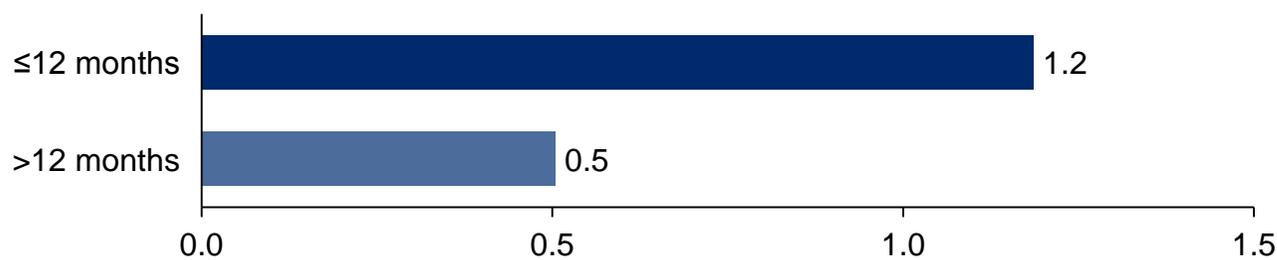
Source: CSAF lenders survey conducted between April – June, 2018 of 3,556 individual loan transactions

Total interest and fee income was lower among short-term loans despite higher annualized income

Average annualized interest income; Interest income less currency losses (% p.a.)  Currency loss

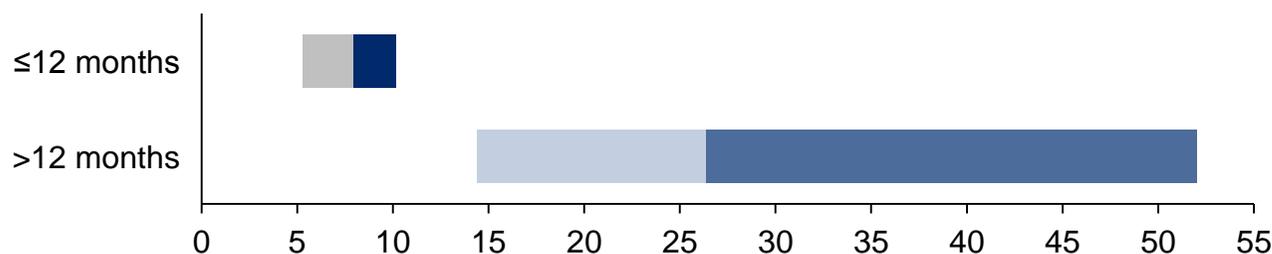


Average annualized fee income; Fee income (% p.a.)



- Annualized interest and annualized fee income was greater for short-term loans by 1.8 percentage points and 0.7 percentage points lower respectively after currency losses were taken into account

Tenor length; Median, interquartile range (months)

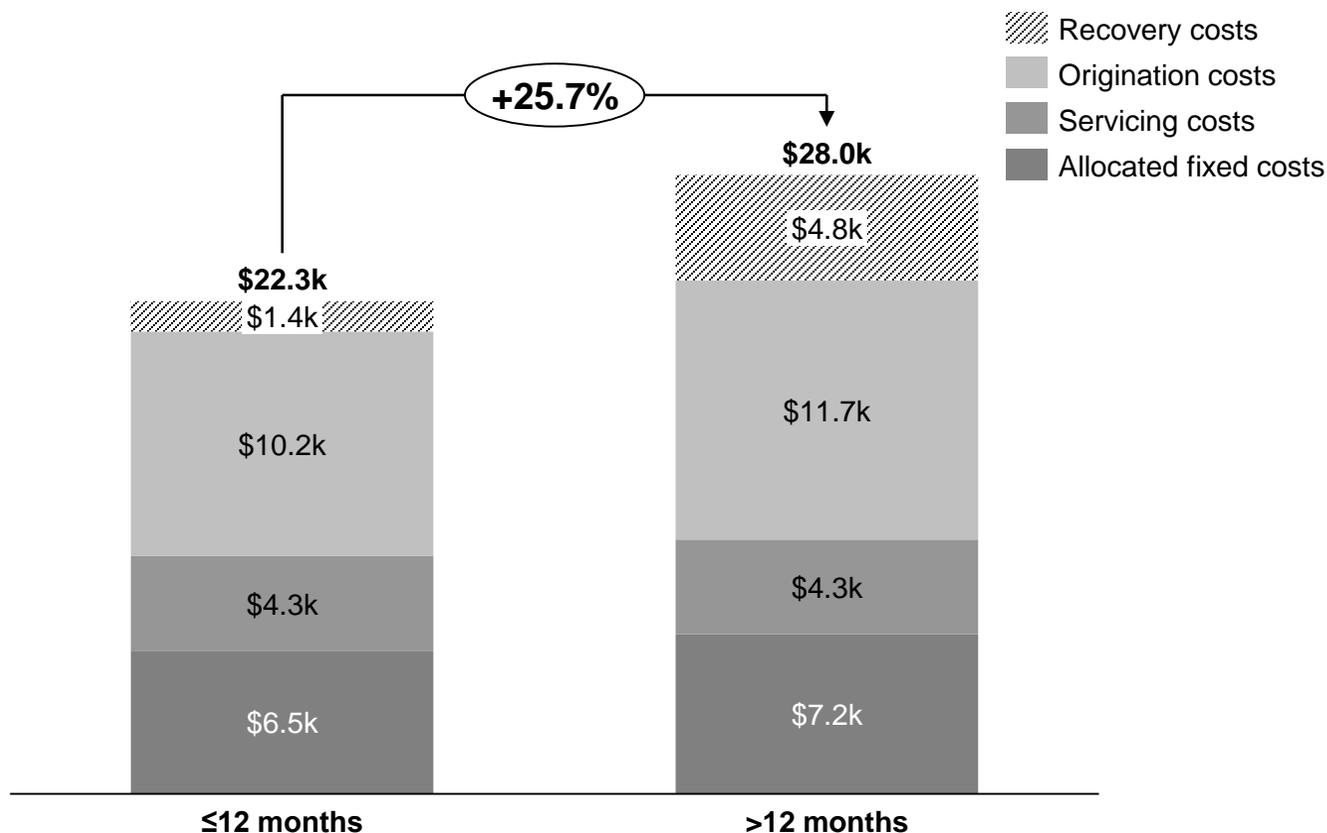


- The principal driving factor for lower income was the shorter tenor

Operating costs per loan were higher for longer-term loans after adjusting for tenor

Operating expenses by tenor

Average cost per loan, standardized 12 months, USD

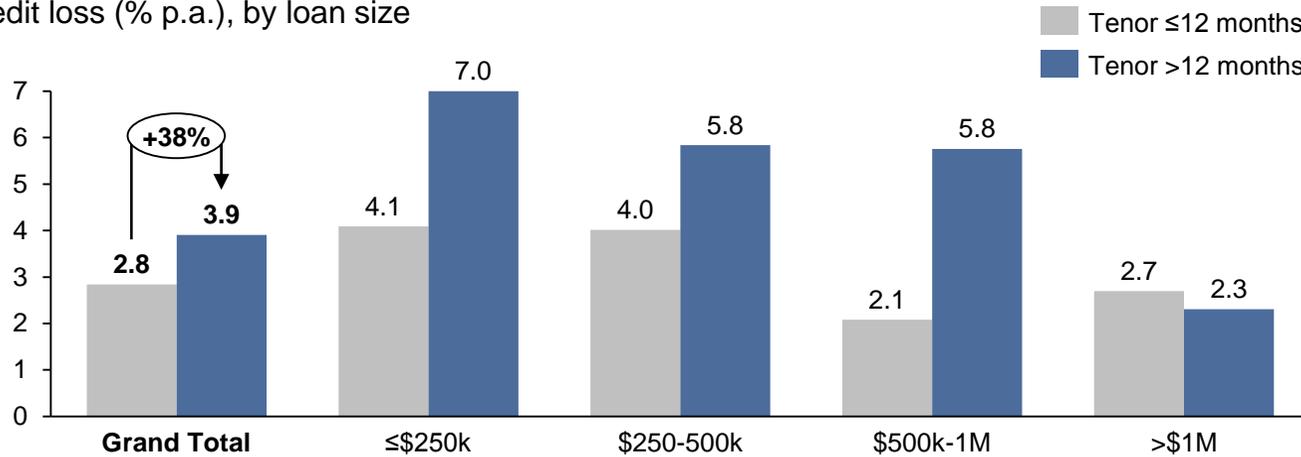


- The longer-term loans showed reasonably higher operating costs even when adjusted to average over a 12-month period, owing largely to the higher recovery costs
- There was also a higher origination cost associated with the longer tenor loans, potentially owing to higher diligence efforts required for longer-term lending

Higher credit losses among long-term loans were principally driven by a higher percentage of impaired loans

Total credit losses

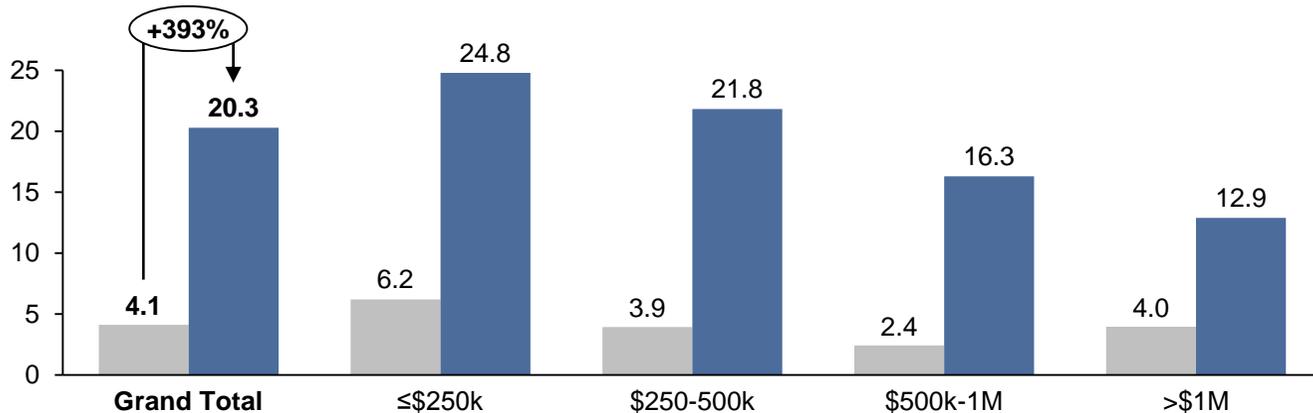
Credit loss (% p.a.), by loan size



- Credit losses were significantly higher in most size brackets among long-tenor loans
- Overall, annualized credit losses for longer-term loans were 1.1 percentage points higher than among short-term loans

Impaired loans

Percentage of loans (%), by loan size



- The higher credit losses were principally driven by a higher percentage of impaired loans

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- 4. Implications**
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There are several ways in which donors can address the finance gap for ag-SMEs using blended finance instruments and other supporting mechanisms

		 1 Low income 2 High cost 3 High risk 	Driver addressed
Blended finance instruments	 Output-based incentives	Instruments that incentivize private investment in high-impact but underdeveloped segments of the market	1 2 3
	 Risk mitigation	Mechanisms that protect investors against systemic risks to their portfolio, or reduce potential losses if risks materialize	1 2 3
	 Direct funding	Direct concessional funding in a financial service provider serving high-impact and underdeveloped market segments	1 2 3
	 Technical assistance	Interventions to increase addressable demand by building capacity for prospective borrowers and/or also providing supporting to lenders to hone their financial products and delivery to reach the market	1 2 3
Other supporting mechanisms	 Cost-cutting technology and innovation	Support disruptive technological innovations; encouraging new actors to enter the market with different business models to serve agricultural SMEs, thereby driving competition and efficiency	1 2 3
	 Coordinated value chain interventions	Support interventions that increase coordination throughout the value chain to enhance efficiency and transparency	1 2 3
	 Enabling environment	Engage public and private sector actors to identify and address legal, regulatory, and policy barriers; target key infrastructure investments; and facilitate dialogue and learning exchange	1 2 3

Output-based incentives: A pay-per-loan facility could allow lenders to increase profitability on low-margin borrowers



Objective

- Increase addressable lending market by incentivizing loans in high-impact but underserved segments
- Make low-margin / loss-making loans more economically viable for lenders

Theory of Change

Supporting earlier-stage, smaller borrowers on their growth journey with a time-bound subsidy can help those such borrowers grow their enterprises in a way that makes them profitable to serve by CSAF lenders or other intermediaries

How it would work

Lenders receive additional revenue for each loan made within specified segments or meeting certain impact criteria

- Committee sets eligibility criteria for impact segments, e.g.,:
 - Frontier markets: loans in sub-Saharan Africa
 - Small facility size: loans under \$500k
 - High-cost value chains: loans in loose value chains
- Lenders that make qualifying loans can submit funding requests to the committee on a periodic basis (e.g., annual or semi-annual)
- Committee reviews applications and provides funding for all qualifying loans

Risks & mitigation

- Potential risk of lenders misrepresenting loan classifications, or gamifying facility sizes to maximize reward
Mitigation: clearly defined criteria parameters and caps; milestone-based reward design; random audits
- High degree of overhead may be required to assess payouts to lenders at a loan-level
Mitigation: outsourcing to 3rd parties specialized in verification

For example a tiered-system could use a points-based approach to determine the required level of subsidy



ILLUSTRATIVE EXAMPLE

	Size	Number of loans	Borrowers status	Value chain type	Average loan size	Average subsidy need per loan (%) ¹	Average subsidy need per loan (USD)	Implied donor leverage ²
1st tier	>500k	1223	existing	-	\$1.2M	N/A	N/A	N/A
2nd tier	>500k	248	new	-	\$1.3M	0.2%	\$5k	260x
3rd tier	≤500k	1781	existing	-	\$0.3M	6.4%	\$20k	15x
	≤500k		new	tight				
4th tier	≤500k	304	new	loose	\$0.2M	16.8%	\$40k	5x

(1) Based on CSAF lenders data only

(2) Calculation: Average loan size / Average subsidy per loan

Source: CSAF lenders survey conducted between April – June, 2018 of 3,556 individual loan transactions

Risk mitigation: A first-loss protection facility could make lending in riskier segments more attractive for lenders



Objective

- Allow testing of lending segments with high perceived risks and identify potential pockets of profitability
- Increase inclusion by providing access to borrowers without prior credit history

Theory of Change

Support market development of segments perceived to be risky to test and identify pockets for sustainable lending and attract commercial capital to high-impact segments through a demonstration effect

How it would work

Lenders lending in 'risky' loan segments are eligible for access to a credit guarantee facility to provide first loss buffers and/or cover losses (partial or full) in case of default by borrower

- Committee sets eligibility criteria for high-risk and high-impact segments, as well as parameters levels of loss cover for each segment
 - First-time borrowers: lending to an SME without prior credit history
 - Long-term / asset-finance borrowing: lending to an SME with a 12 month+ tenor for repayment
- Lenders can submit details of their portfolio within the sub-segment, of which the first-loss facility can be utilized to the extent of the % cover offered
- Committee reviews applications and provides credit loss cover based on defined parameters
- Potential to create moral hazard of encouraging perverse risk-taking behavior of lenders
Mitigation: first-loss facility at a portfolio level, if provided by generating a high volume of qualifying loans; careful definition of parameters, as well as ensuring appropriate caps on the facility;

Risks & mitigation

An example estimate of how much a first-loss cover facility would require to subsidize based on the CSAF portfolio



ILLUSTRATIVE EXAMPLE

Risk segment	% impaired within risk segments	% impairment for non-risk segment ¹	First-loss cover for incremental risk %	Total guarantee cover for \$10M incremental lending
Frontier markets (Sub-Saharan Africa)	7.1%	2.7%	4.4%	\$440k
First-time borrowers	6.8%	2.7%	4.1%	\$410k
Long-term loans (>12 months)	9.2%	1.7%	7.5%	\$750k
Small facility loans (<500k)	5.0%	2.4%	2.6%	\$260k
Loose value chain loans (non-coffee / cocoa)	6.3%	2.3%	4.0%	\$400k

Direct funding: Balance sheet support would allow lenders to take on more risk while meeting investor requirements



Objective

- Allow lending in riskier segments while meeting capital requirements around risk covenants
- Increase access to long-term loans for SMEs to fuel their longer-term investments and growth

Theory of Change

Providing balance sheet support will allow lenders to have higher exposure to risk while meeting risk covenants, and a lower cost of capital its cost of capital

How it would work

Lenders would receive balance sheet support to improve leverage ratio and increase risk appetite for making higher risk loans without breaching investor covenants or requirements

- Size of balance sheet support directly proportional to increase in 'higher risk' capital available
- Alternatively, concessional interest rates could be offered to lower average cost of funds
- Lenders that demonstrate higher impact and willingness to take on more difficult segments would receive continued support, others would see balance sheet support decrease over time
 - Frontier markets: loans to SMEs in sub-Saharan Africa
 - Loose value chains: loans in value chains other than coffee or cocoa
 - Long-term / asset-finance borrowing: lending to an SME with a 12 month+ tenor for repayment

Risks & mitigation

- Potential to create moral hazard of encouraging perverse risk-taking behavior of lenders
Mitigation: careful definition of parameters, as well as ensuring appropriate caps on the facility

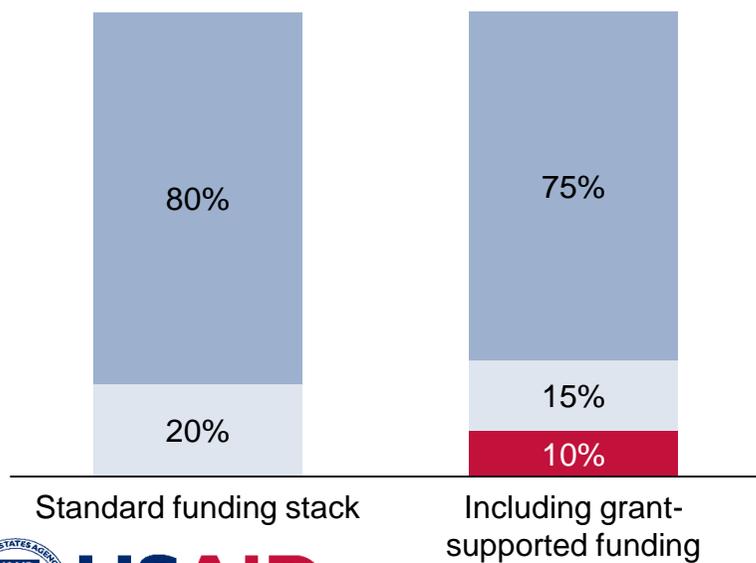
An example of how direct funding could increase lender's risk appetite, by providing 10% buffer capital



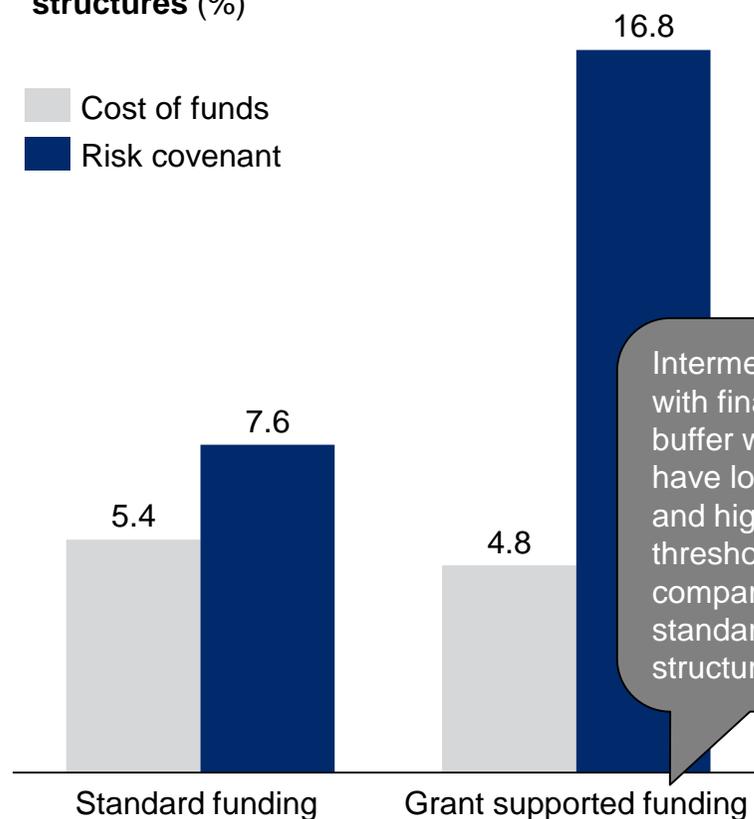
ILLUSTRATIVE EXAMPLE

Illustrative standard and grant supported funding structure (%)

	Cost of funds	Risk covenant*
Class A - Senior debt	5%	7%
Class B - Catalytic debt	7%	10%
Class C - Grant	0%	100%



Illustrative Total cost of funds and risk covenant for standard and grant-supported funding structures (%)



Intermediaries with financial buffer would have lower return and higher risk thresholds compared to standard funding structures

(*) Risk covenant defined as the maximum percentage of lent capital that can be at risk

Technical assistance: Advisory services can be provided to lenders and borrowers to lower costs and risk for agricultural SME finance



Objective

- Provide services to lenders to lower transaction costs and/or improve risk management
- Provide services to borrowers to improve enterprise management capacity and lower lending risk

Theory of Change

Providing assistance to lenders can reduce some transaction costs to make lending in low-revenue segments profitable, while support to borrowers reduces risk of lending to them

How it would work

Lenders would have access to pooled resources such as standardized templates, TA facilities, deal flow/match-making platform, etc. and/or borrowers would have access to advisory services which could increase their performance and reduce risk

- Use would be only for member organizations that qualify to meet certain eligibility requirements, e.g.,
 - Loan volume: Must have certain number of transactions to qualify for access to TA facility
- Standardized pricing and other guidance on how and when to use would be provided

Risks & mitigation

- Potential of providing high-cost initiatives which may not yield desired results or outcomes
Mitigation: conducting demand assessment; running pilot programs

Some examples of assistance programs for lender and borrower technical assistance can be explored



Lender assistance

- Support transaction process through advisory services, including:
 - Pipeline building and origination
 - Due diligence support
 - Legal service providers
- Training facilities may include support on gaining internal efficiencies, such as:
 - Streamlining of processes
 - Capacity building of human capital
 - IT system development

Borrower assistance

- Technical assistance can be provided to borrowers to increase lender confidence, such as:
 - Improving financial reporting and accounting procedures
 - Strengthening governance mechanisms
- Training support for borrowers may include advisory services on business planning and growth, such as:
 - Growth / expansion strategies
 - Process efficiency

Cost-cutting technology and innovation: encouraging role of new disruptive actors in the ecosystem to increase efficiencies



Description

Supporting the creation and catalytic technology and business model innovations to bring in new actors and drive efficiencies in the market in the form of reduced cost to serve and increased transparency

Examples

- **Financial services:**
 - **Alternative credit scoring** and credit monitoring to bring new customer segments into the addressable market for input and post-harvest financing
 - **Agri insurance** that leverages more localized data on farms and the surrounding conditions (e.g., through satellite technology or drones), helping insurers more easily manage risk and analyze premiums
 - **Cashless payments** that eliminates the risk of holding and transporting cash
- **Shared services providers:**
 - **Centralized legal services** that ensure quality and lower costs for individual lenders
 - **3rd party monitoring officers** that can conduct routine activities at a local level

Coordinated value chain interventions: create a more attractive lending market by increasing market efficiency and transparency



Description

Supporting programs and initiatives along agriculture value chain that allow increased coordination, efficiency and transparency, to encourage additional lending activity from new and existing players

Examples

- **Supply chain management:**
 - **Product tracing:** Digital platform for tracking and quality assurance, from certification to quality declared (e.g., barcode or scratch coin verification for seeds)
 - **Logistics coordination:** Digital platforms to link farmers/traders to available storage facilities
- **Market access:**
 - **Aggregation tools:** Digital platform for tracking and quality assurance, from certification to quality declared (e.g., barcode or scratch coin verification for seeds)
 - **Digital marketplaces:** virtual cooperatives that match it to supply, provide real time price information on inputs, and facilitate low-cost transactions between farmers and input providers
- **Ag intelligence, knowledge, and management:**
 - **Ag trends mapping and prediction:** Harmonized, digital database to manage regulatory systems

Enabling environment: encourage policy and infrastructure decisions that support agri-SMEs



Description

Supporting local initiatives of public and private sector actors on enhancement of policy, infrastructure and knowledge sharing

Examples

- Identify legal, regulatory, and policy barriers: conduct legal and regulatory assessment to identify barriers to agri-SME financing and broader sector development
- Engage partners and influencers: collaborate with other actors (e.g., NGOs, multi-lateral / bi-lateral organizations, policy organizations) in the market to align agendas and pave a common path forward to influence policymakers
- Develop communities to share knowledge: engage different intermediaries the sector in various forums that encourage to knowledge sharing and idea generation

In summary, these tools can both, support existing lenders to expand their addressable market, and attract new actors in the sector

		1 Low income	2 High cost	3 High risk	Driver addressed	Expected outcomes and impact
Blended finance instruments	 Output-based incentives	1	2	3	<ul style="list-style-type: none"> Support existing lenders to continue lending sustainably while expanding addressable market to high-impact, hard-to-serve agricultural SME segments 	
	 Risk mitigation	1	2	3		
	 Direct funding	1	2	3		
	 Technical assistance	1	2	3		
Other supporting mechanisms	 Cost-cutting technology and innovation	1	2	3	<ul style="list-style-type: none"> Encourage new players and innovative business models to serve agricultural SMEs Create an ecosystem that can attract more lenders and more capital in the underserved agricultural SME lending space 	
	 Coordinated value chain interventions	1	2	3		
	 Enabling environment	1	2	3		

Agenda

1. Introduction
2. Approach
3. Key findings
4. Implications
- 5. Appendix**

Appendix 1: Research confirmed the significant social impact of bridging the agricultural SME financing gap

- **The agricultural sector has huge lever on poverty: three-quarters of the developing world lives in rural areas, and about nine out of every ten depend upon agriculture for their livelihoods¹.** Agricultural investment is often regarded as one of the most efficient and effective ways to promote food security and reduce poverty, with some studies demonstrating a four-fold reduction in poverty over other sectors².
- **Evidence suggests improved access to finance products for agricultural SMEs can help boost smallholder farmers consumption, food security, income, production, and resilience to external shocks³.** It also suggests a wide variation of take-up for financial products and positive effects concentrated on certain pockets of borrowers. Results from studies that examined agriculture-specific products suggested positive impacts on production, use of formal financial services, and maize inventories.
- **There are two principal channels through which credit interventions impact rural populations:**
 - Access to credit could allow farmers to invest in agricultural inputs such as labor, land area cultivation, equipment, improved variety seeds, or fertilizers which they might not otherwise be able to afford. Increased investment in inputs should lead to increased production.
 - Access to credit could give poor households another strategy to cope with risk: in the case of a shock, the household could borrow money rather than liquefying assets, limiting consumption, or selling off-farm labor.
- **Two examples:**
 - A World Bank policy research working paper⁴ measured the impacts of semi-formal credit provided by cooperatives, input suppliers, microfinance institutions, and NGOs in rural Rwanda. Removing all household-level credit constraints was estimated to increase the total value of a household's agricultural output by 17 percentage points, from USD 272 to USD 326.
 - A 2014 randomized control trial study in a rural area of Morocco dominated by smallholder agriculture found an average 140 percent return to microcredit capital on business profit.

(1) Oxfam. 2009. The Missing Middle in Agricultural Finance — Relieving the Capital Constraint on Smallholder Groups and Other Agricultural SMEs. (2) World bank. 2007. World Development Report 2008: Agriculture for Development. (3) Rural Agricultural Finance Learning Lab. 2015. Evidence on the Impact of Rural and Agricultural Finance on Clients in Sub-Saharan Africa: a Literature Review. (4) World bank. Policy research working paper. 2014. Credit constraints, agricultural productivity, and rural nonfarm participation : evidence from Rwanda (4) Crepon, et al. 2014. NBER working paper. Estimating the Impact of Microcredit on Those Who Take It Up: Evidence from a Randomized Experiment in Morocco

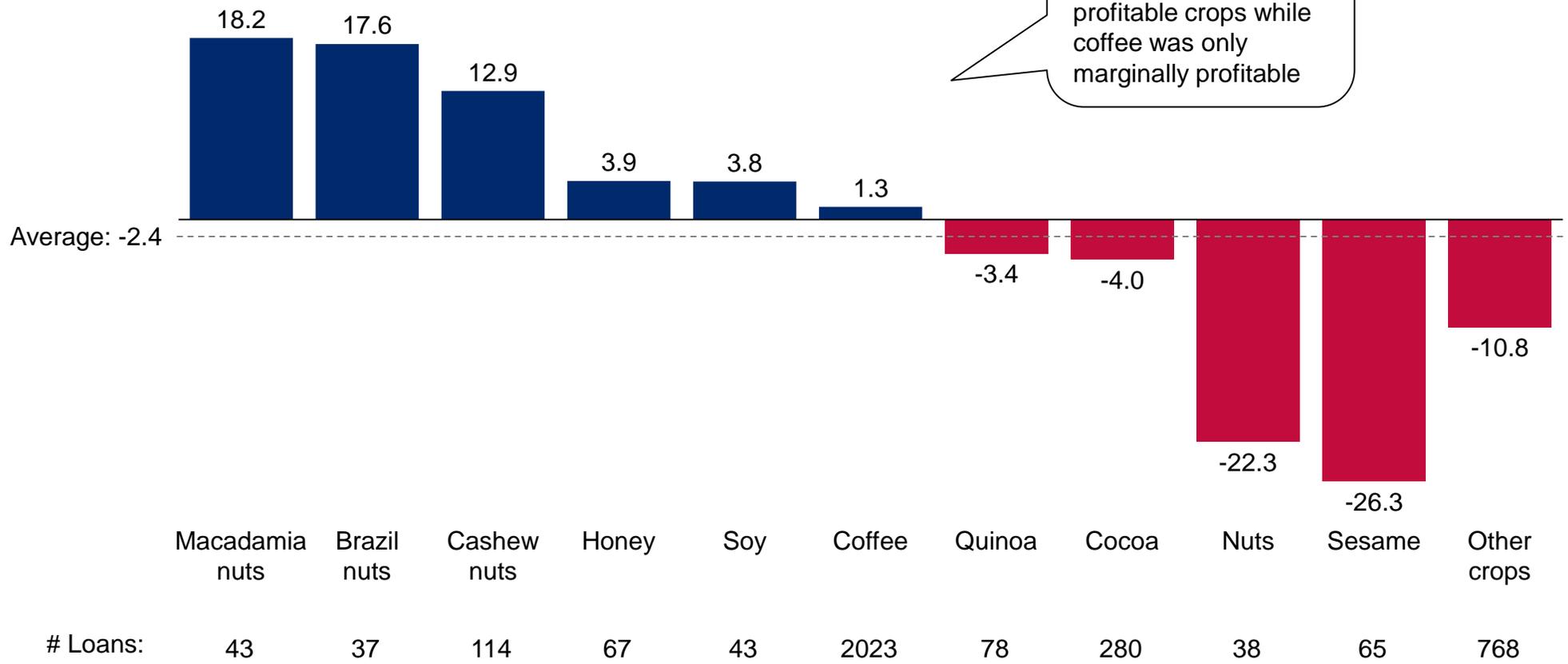
Appendix 2: Detailed value chain breakdown of loan performance (1/2)

Variable	Coffee	Cocoa	Cashew nuts	Quinoa	Honey	Sesame	Brazil nuts	Soy	Other nuts	Macadamia nuts	Other crops
# loans	2023	280	114	78	67	65	43	43	38	37	768
Av. loan size (\$k)	663 046	758 381	718 242	956 710	447 329	723 487	713 951	583 641	565 601	707 090	616 855
Av. Tenor (months)	11.9	12.1	11.9	7.7	11.9	12.5	10.7	11.0	10.1	12.6	24.7
Interest yield p.a.* (%)	8.5%	7.8%	8.2%	7.9%	9.0%	8.3%	8.1%	8.9%	7.4%	8.9%	6.7%
Fee yield p.a.* (%)	1.2%	1.0%	0.7%	0.4%	0.9%	0.7%	0.6%	0.5%	0.6%	1.6%	0.4%
Write-off p.a.* (%)	3.2%	3.9%	2.5%	4.0%	0.7%	9.1%	0.0%	2.4%	8.7%	0.4%	3.5%
Currency losses p.a.* (%)	0.01%	1.65%	0.00%	0.00%	0.00%	0.04%	0.00%	0.00%	0.02%	0.00%	0.57%
Op. cost/loan (\$k)	19 909	19 359	22 583	19 919	23 406	18 997	22 313	21 624	15 386	27 457	37 325
Recovery cost/loan (\$k)	1 591	2 675	2 373	1 996	918	6 755	1 942	4 636	3 301	2 724	4 798
Cost of funds/loan (\$k)	10 353	15 709	16 855	11 458	8 820	17 683	13 910	11 689	14 879	14 375	32 859

Appendix 2: Detailed value chain breakdown of loan performance (2/2)

Profitability

Net profit, by value chain (USD thousands)



Appendix 3: Loan data collection methodology (1/7)

Collection

Data collection summary

- Dalberg requested data on value chain, country, first time borrower status, product type, loan/facility size, origination fees, interest type, annual interest rate (%), date of first disbursement, currency and balance at 30+, 90+, 180+ and 365+ days past due (dpd)
- Dalberg analyzed data on 3,556 loans out of 4,488 received from nine CSAF lenders
 - Dalberg omitted 391 loans (11% of loans) as they were out-of-scope (non-agricultural value chain, outside of time period under consideration, or in a region other than Africa, Asia or Latin America)
 - Dalberg excluded a further 284 loans (7.1% of remaining loans) without loan characteristics data
 - Dalberg excluded a further 252 loans (6.6% of remaining loans) with incomplete or inconsistent loan transaction data

Data limitations

- Some lenders provided loan-level transaction data segmented by customer. In some cases this resulted in overlapping loans to one customer. To standardized these, Dalberg separated loans to the same customer into separate segments (or borrower transaction relationships) where there existed an interim period in which the outstanding balance fell to zero
- Some lenders provided slightly incomplete loan characteristics data (e.g. missing contractual interest rate, tenor, etc.) for a subset of loans with corresponding loan transaction data. Where this was the case, Dalberg omitted these loans for outputs in which they were directly relevant, but included them in all other analyses

Appendix 3: Operating costs data collection methodology (2/7)

Collection

Data collection summary

- Dalberg requested each lender to share their operating cost data, including personnel costs, travel, legal / professional, and other
- Where possible, Dalberg also requested cost breakdown for Headquarters vs. business units in different regions
- Additionally, Dalberg asked each lender to estimate the percentage of their total costs they would allocate to specifically their agri-lending activities
- Finally, during individual lender meetings and through follow-ups after, Dalberg requested allocation of costs across the different stages of the loan lifecycle
- 4 out of the 9 lenders shared data in the standardized format requested in the template, while the others shared cost data in other formats used internally or in financial reports

Data limitations

- Different organizations have varying methods of reporting operating costs that are difficult to disaggregate and allocate with full accuracy
- Variations in organization structures and locations can have significant impact on their operating costs

Appendix 3: Loan data standardization and analysis (3/7)

Standardization

- Dalberg standardized the start date of all loans to calculate the utilization and duration of the loans
- Dalberg standardized the product type to either working capital or asset finance. Value chain was assigned in a hierarchical structure: (i) we assigned loans in the coffee or cocoa value chain as coffee or cocoa; (ii) for remaining loans, we assigned loans in hard currency to 'export oriented', and loans in local currency to 'domestic oriented'. We classified size segment based on the loan/facility size variable
- The value of disbursements, repayments, write-offs, fees, interest and outstanding balance was converted to USD (or EUR for West African Francs) using exchange rate data with month-level granularity. For loans analyzed in EUR, this report presents total results in USD converted at today's exchange rate to enable a like-for-like comparison
- A weighting factor – the dollar duration - was calculated as the product of loan size with loan duration in years. We then calculated annualized interest yield p.a., annualized fee yield p.a., annualized write-off yield p.a. and annualized currency loss percentage as the value of the variable in dollars divided by the weighting factor (dollar-duration) of the loan¹
- For currency losses for loans in local currency, the total currency loss was calculated as the total disbursed (USD) – total repaid (USD) – total write-off (USD) – total outstanding balance (current USD)
- For loans in delinquency, in the absence of lender guidance on expected recovery, Dalberg assumed 0% recovery for active loans 365+ days past due (DPD); 25% for 180–365 DPD; 50% for 90–180 DPD; and 75% for 30–90 DPD
- Where write-offs were listed beyond two years after the last disbursement or repayment, Dalberg applied a cut such that the write-off was registered 24 months after the last disbursement or repayment. This was done to prevent an unfairly high weighting on loans with a long time to write-off in aggregated figures

1) For aggregated figures, the summed values of the loan variable was divided by the summed values of the weighting factor

Appendix 3: Operating costs data standardization (4/7)

Standardization

Operating cost data standardization

- Dalberg assigned CSAF lender operating costs for lending activity to the three stages of the lending process, and validated them through one-on-one meetings with each lender
 - Annual operating costs for each lender were allocated to the different stages of the loan lifecycle based on estimations from lenders around time and effort across each
 - Costs associated with non-agriculture lending, technical assistance, and fundraising activities were excluded from operating costs
 - Costs were adjusted for regional-level differences within each lender
 - Costs were then allocated at a loan level by stage:
 - Origination costs were allocated based on the year of origination
 - Servicing and overhead costs were allocated based on month and years of active tenor
 - Recovery costs were allocated over the period analyzed
 - Manipulations for unavailable data:
 - Extrapolated data breakdown for years based on financial statements
 - Allocated regional costs based on lending activity
 - Extrapolated 2017 per loan costs for servicing and overheads loans with tenors beyond 2017
 - Exclusions:
 - Dalberg excluded loans of lenders' first year of operations as costs allocated to an individual loan would be overstated

Appendix 3: Operating costs data analysis (5/7)

Standardization

	1. Origination	2. Servicing	3. Recovery
Activities	<ul style="list-style-type: none"> • Sourcing / Pipeline development • Due diligence • Processing and underwriting 	<ul style="list-style-type: none"> • Monitoring • Reporting • Client Servicing 	<ul style="list-style-type: none"> • Collection • Legal recourse • Collateral liquidation
Direct costs	<i>Salaries</i>		
	<i>Travel</i>		
	<i>Legal</i>		<i>Legal</i>
Indirect costs (overheads)	<i>IT / Admin / Backoffice</i>		
	<i>HQ allocation</i>		
Loan-level allocation	$\frac{\text{Origination costs for the year}}{\text{\#loans originated within the year}}$	$\frac{\text{Servicing cost for the year}}{\text{Full year equivalent loans active in the year}^1}$	$\frac{\text{Total recovery costs in org history}}{\text{\# loans in recovery at any point}^2}$

Active period is determined based on date of disbursement and contractual tenors

Appendix 3: Cost of funds analysis (6/7)

Analysis

- Dalberg designed its cost of funds approach to reflect the specific condition of institutions facing impact driven investors and lenders. The two main elements of this analysis were:
 - Average COF was set at 3% after discussion with CSAF lenders
 - This average was risk adjusted on a loan-by-loan basis, based on loan characteristics data and sample averages
- Dalberg conducted a risk adjusted estimation of cost of funds on a loan by loan by loan basis. Dalberg made the following assumptions:
 - **Debt to equity ratio.** Based on Basel III Advanced IRB risk-weighted assets formula. The probability of default was estimated based on regional and size segment averages observed in our data, using linear extrapolation for Asia and East Africa outliers. Loss given default was set at 75%
 - **Cost of debt.** Calculated by loan as the sum of risk free rate and a risk premium. Dalberg used EUR yield curves for EUR and XOF and USD yield curves for all other currencies
 - **Cost of equity.** Calculated for all loans based on a 20% average ROE. Average calculated for a representative panel of largest banks in each major CSAF country.
- Dalberg normalized the results to average at 3% p.a. with 0.5% standard deviation.

Appendix 3 : Annualized yield calculation (7/7)

Dollar duration (\$)

A portfolio with a dollar duration of \$100 is equivalent to having one loan of \$100 fully outstanding for 1 year

Annualized yield p.a. (% per \$ per year)

A portfolio with an annualized income yield p.a. of 1% and an average balance of \$100 over a year will bring \$1 of income over the year.

Illustration : annualized credit-loss %

A portfolio with an annualized credit loss percentage of 10% and an average balance of \$3M over a year will incur a loss of \$600k over the year

$$= \frac{\text{duration} \times \text{loan size}}{12}$$

$$= \frac{\text{Total portfolio income}}{\text{Total portfolio dollar duration}}$$

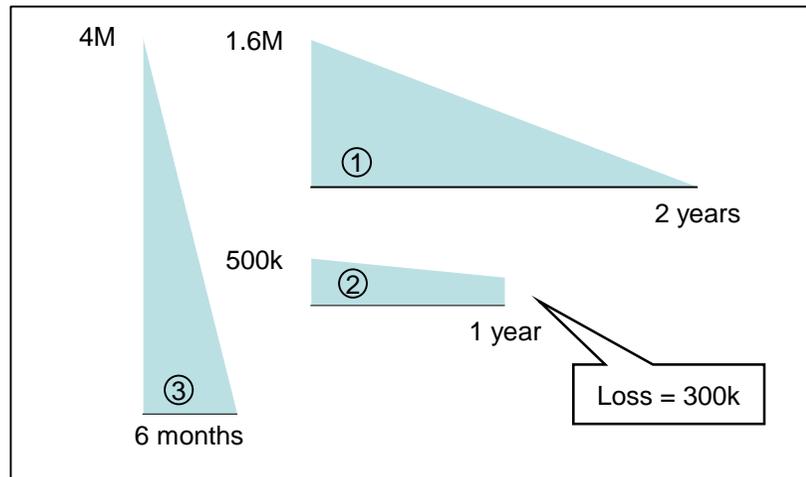
$$= \frac{\text{Total portfolio credit loss}}{\text{Total portfolio dollar duration}} = \frac{\$300k}{\$3M} = 10\%$$

An example portfolio, composed of 4 loans

Average balance over time, USD

Total area = area (1) + area (2) + area (3) = 3

Total portfolio credit loss = 300k

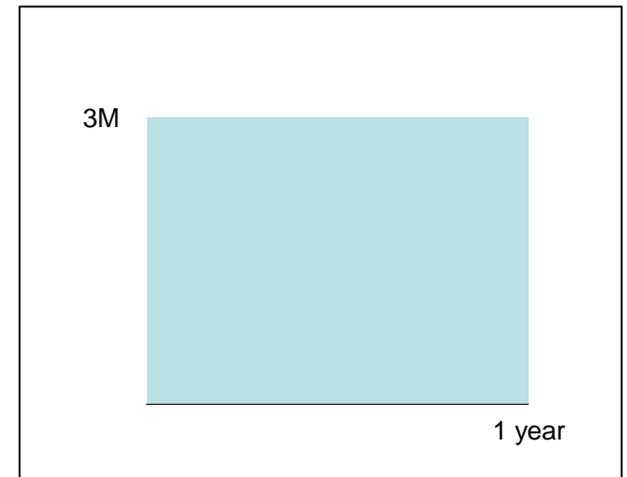


One year equivalent to the example portfolio

Average balance over time, USD

Total area = 3 = 1 year x dollar duration

Total portfolio dollar duration = \$3M



Appendix 4 : All CSAF lenders data by geography and value chain (1/2)



Region	Value chain	# loans	Average loan size	Headline Interest Rate ²	Interest yield p.a. (annualized, gross) ¹	Fee yield p.a. (annualized) ¹	credit losses, net of recoveries (annualized) ¹	Currency loss (annualized)
Rest of Africa	Cocoa	84	1,106,231	9.85%	9.16%	1.13%	1.61%	4.58%
	Coffee	43	430,156	9.50%	8.67%	1.34%	2.00%	0.00%
	Domestic Oriented	40	259,890	14.22%	10.00%	0.50%	6.75%	2.41%
	Export Oriented	190	570,379	9.07%	6.99%	0.58%	5.13%	0.00%
East Africa	Cocoa	21	705,225	8.77%	7.91%	2.37%	0.00%	0.00%
	Coffee	222	657,690	9.27%	7.68%	1.41%	6.65%	0.00%
	Domestic Oriented	86	169,456	16.08%	10.18%	0.38%	7.25%	4.64%
	Export Oriented	120	611,515	9.76%	8.37%	1.48%	3.82%	0.00%
Latin America/ Caribbean	Cocoa	164	602,613	8.00%	6.17%	0.86%	0.00%	0.00%
	Coffee	1683	662,121	7.02%	6.16%	1.32%	4.40%	0.00%
	Domestic Oriented	16	905,857	12.11%	7.41%	0.01%	0.00%	3.10%
	Export Oriented	599	680,054	7.03%	5.53%	0.57%	1.09%	0.00%
Asia	Cocoa	11	525,909	9.01%	7.07%	0.77%	5.70%	0.00%
	Coffee	78	834,463	9.29%	8.71%	1.21%	2.56%	0.02%
	Domestic Oriented	10	433,184	14.65%	9.52%	0.03%	0.00%	5.50%
	Export Oriented	194	917,331	8.44%	6.93%	0.35%	3.72%	0.00%
Global		3,556	664,743	9.07%	7.67%	0.80%	3.43%	0.38%

Appendix 4 : All CSAF lenders data by finance type and loan size (2/2)

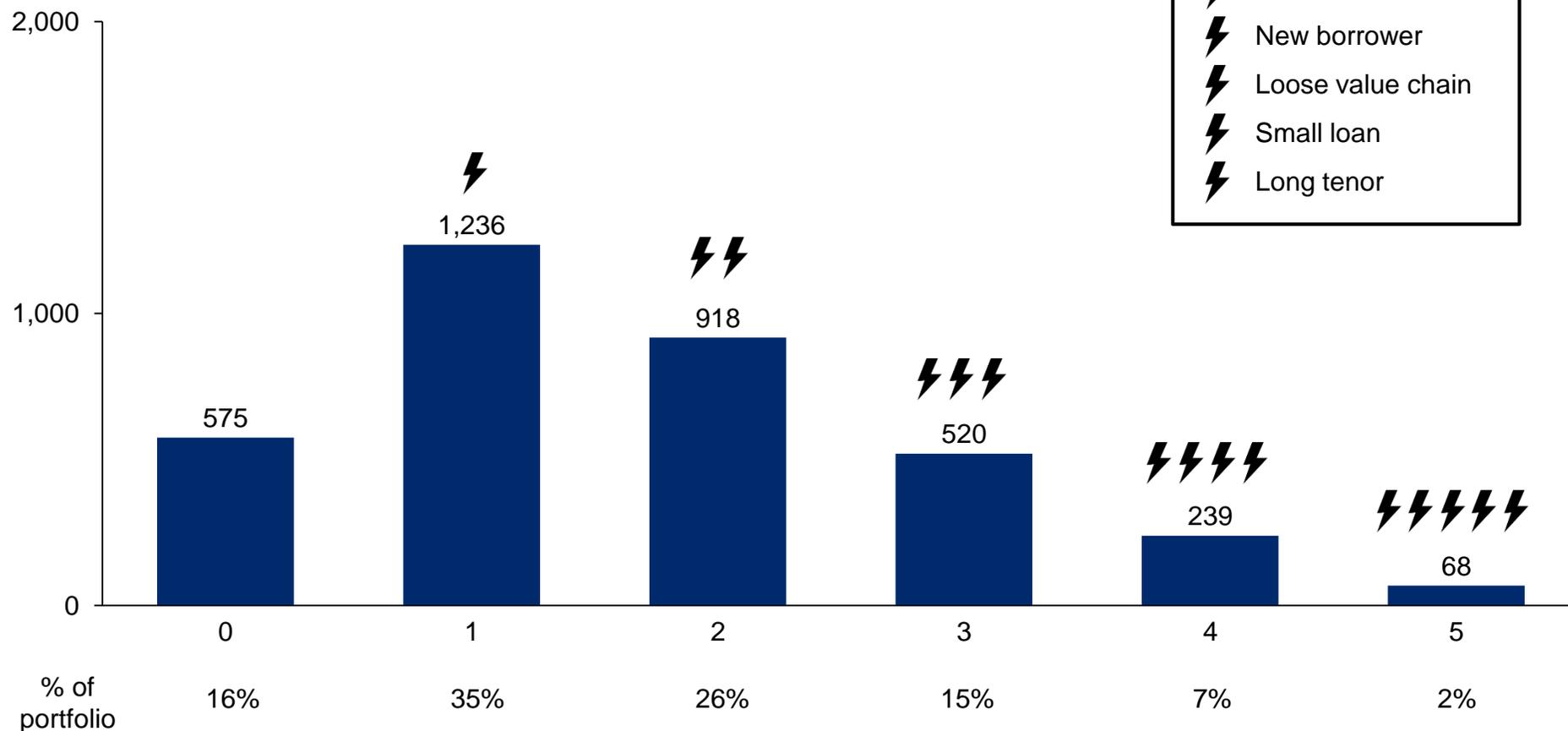
Product type	Loan Size Segment	# loans	Average loan size	Headline Interest Rate ²	Interest yield p.a. (annualized, gross) ¹	Fee yield p.a. (annualized) ¹	credit losses, net of recoveries (annualized) ¹	Currency loss (annualized)
Asset finance equipment	\$250k	176	137,174	9.67%	7.38%	0.33%	5.94%	0.55%
	\$250-500k	109	382,948	9.46%	8.16%	0.21%	3.42%	0.27%
	\$500k-1M	69	761,934	9.81%	6.76%	0.12%	3.75%	1.06%
	>\$1M	61	2,412,811	8.50%	6.38%	0.08%	1.77%	0.59%
Working capital with tenor < 6 months	\$250k	215	163,686	10.07%	9.45%	1.29%	5.65%	0.00%
	\$250-500k	320	381,976	9.73%	8.40%	1.14%	5.93%	0.00%
	\$500k-1M	253	786,761	8.93%	7.66%	0.94%	2.18%	0.00%
	>\$1M	122	1,618,841	8.44%	8.12%	0.91%	0.98%	0.00%
Working capital with tenor < 12 months	\$250k	428	154,855	11.09%	10.70%	1.70%	3.48%	0.45%
	\$250-500k	464	392,859	9.64%	9.72%	1.42%	2.57%	0.00%
	\$500k-1M	435	798,262	9.29%	8.82%	1.36%	2.10%	0.01%
	>\$1M	301	1,809,318	8.45%	7.46%	1.15%	3.12%	0.00%
Working capital with tenor > 12 months	\$250k	202	152,111	10.94%	8.35%	0.92%	7.94%	0.46%
	\$250-500k	174	394,286	9.85%	7.67%	1.05%	8.41%	0.14%
	\$500k-1M	122	773,497	9.43%	7.81%	1.00%	7.42%	0.10%
	>\$1M	110	1,940,240	8.60%	7.74%	1.01%	3.14%	1.13%
Global		3561	664,743	9.07%	7.67%	0.80%	3.43%	0.38%

1. Based on weighted average of individual loan yields by dollar duration

Appendix 5 : Risk factor distribution

CSAF loan portfolio prevalence of risk factors

Number of loans, by number of risk factors



Risk Segments

- ⚡ Sub-Saharan Africa
- ⚡ New borrower
- ⚡ Loose value chain
- ⚡ Small loan
- ⚡ Long tenor

Appendix 6: Glossary of financial performance terms

Annualized credit-losses yield. The total amount of credit losses as a proportion of the total dollar-duration of the portfolio. A credit loss yield p.a. of 1% means that for every dollar that stays outstanding for a year, 1 cents will be lost due to credit losses.

Annualized fee income yield. The total amount of fee income received as a proportion of the total dollar-duration of the portfolio. A fee income yield p.a. of 1% means that for every dollar that stays outstanding for a year, 1 cents will be received in fee income.

Annualized interest income yield. The total amount of interest income received as a proportion of the total dollar-duration of the portfolio. An interest income yield p.a. of 1% means that for every dollar that stays outstanding for a year, 1 cents will be received in fee income.

Annualized profitability yield. The total amount of profit received as a proportion of the total dollar-duration of the portfolio. A profitability yield p.a. of 1% means that every dollar that stays outstanding for a year will make 1 cents of profit.

Credit losses. For a given portfolio, the total amount of money written-off plus expected credit losses. Expected write-offs are thus accounted for as actual write off.

Dollar-duration. The product of the duration of the loan with the total amount disbursed, expressed in dollars. A dollar duration of \$1 is equivalent to a loan of \$1 that is fully outstanding for exactly one year.

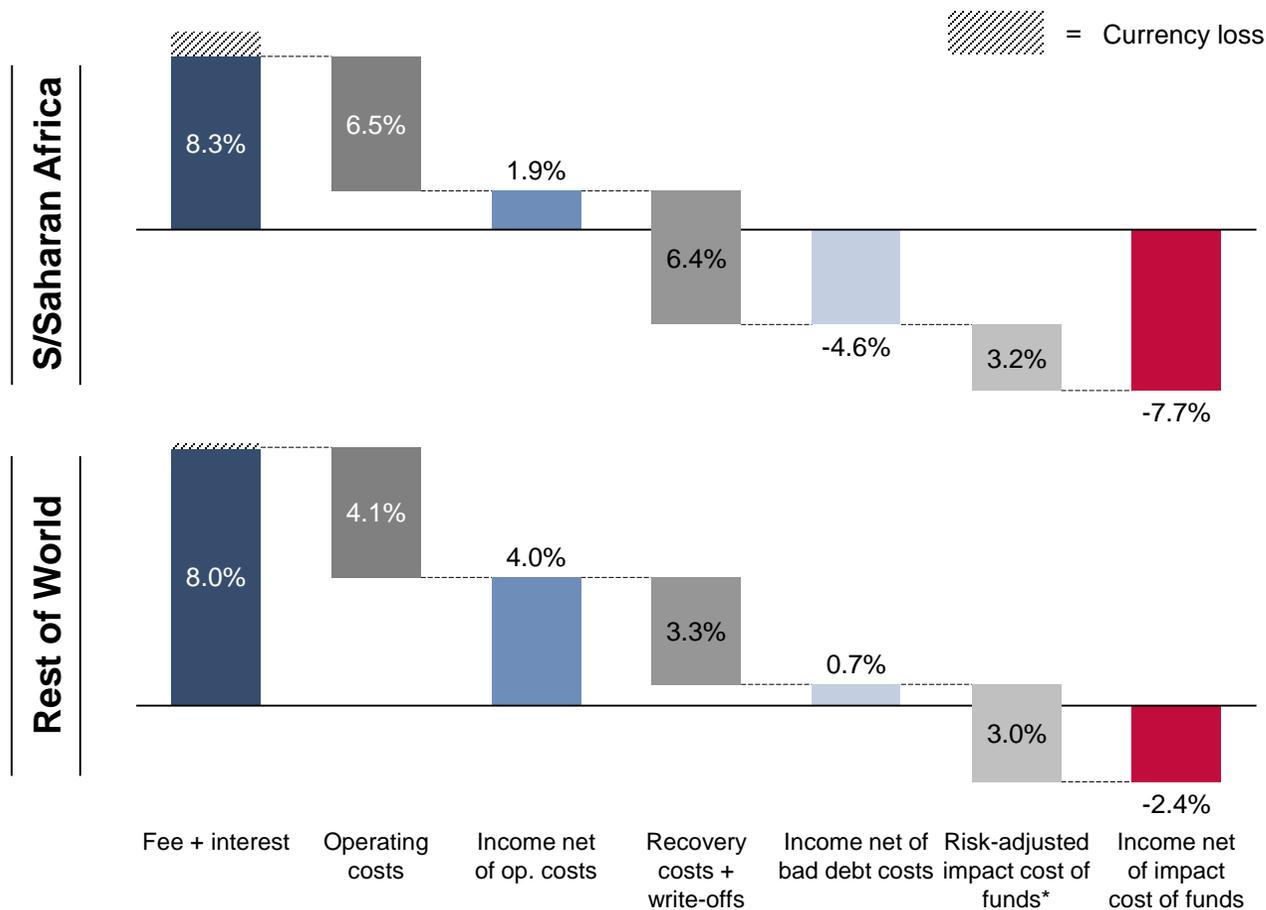
Duration. The average length of time that a given dollar of principal is outstanding. For example, a \$1m loan being repaid in \$500k increments after 6 and 12 months has duration of 9 months.

Utilization. The average outstanding balance over the tenor of the loan. A 100% utilization would imply the full amount of the loan was outstanding for the entirety of the loan tenor.

Appendix 7: Annualized yields for loans in Sub-Saharan Africa vs. rest of the world

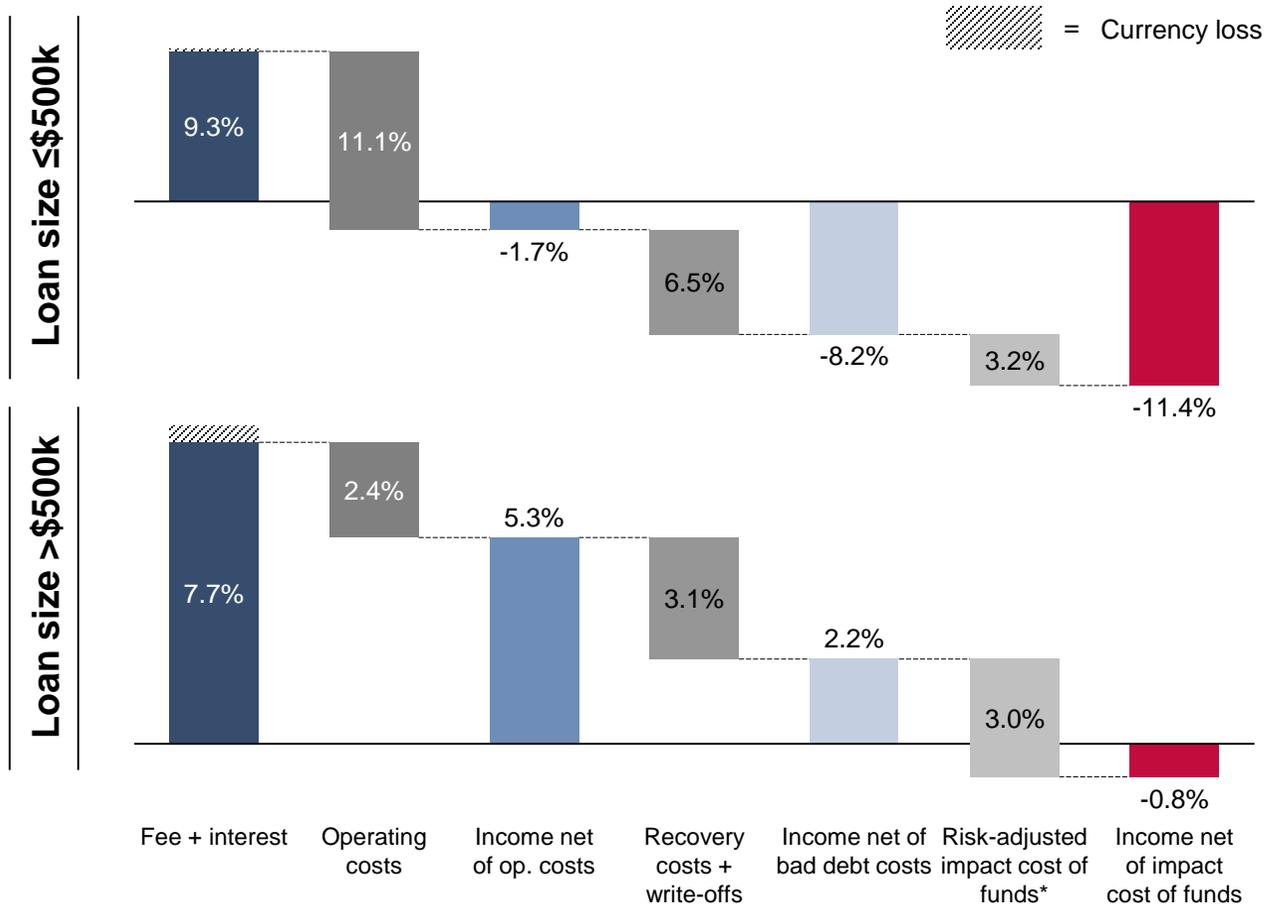
Loan economics averages for all CSAF loans analyzed by region

Annualized yield (% per dollar p.a.)



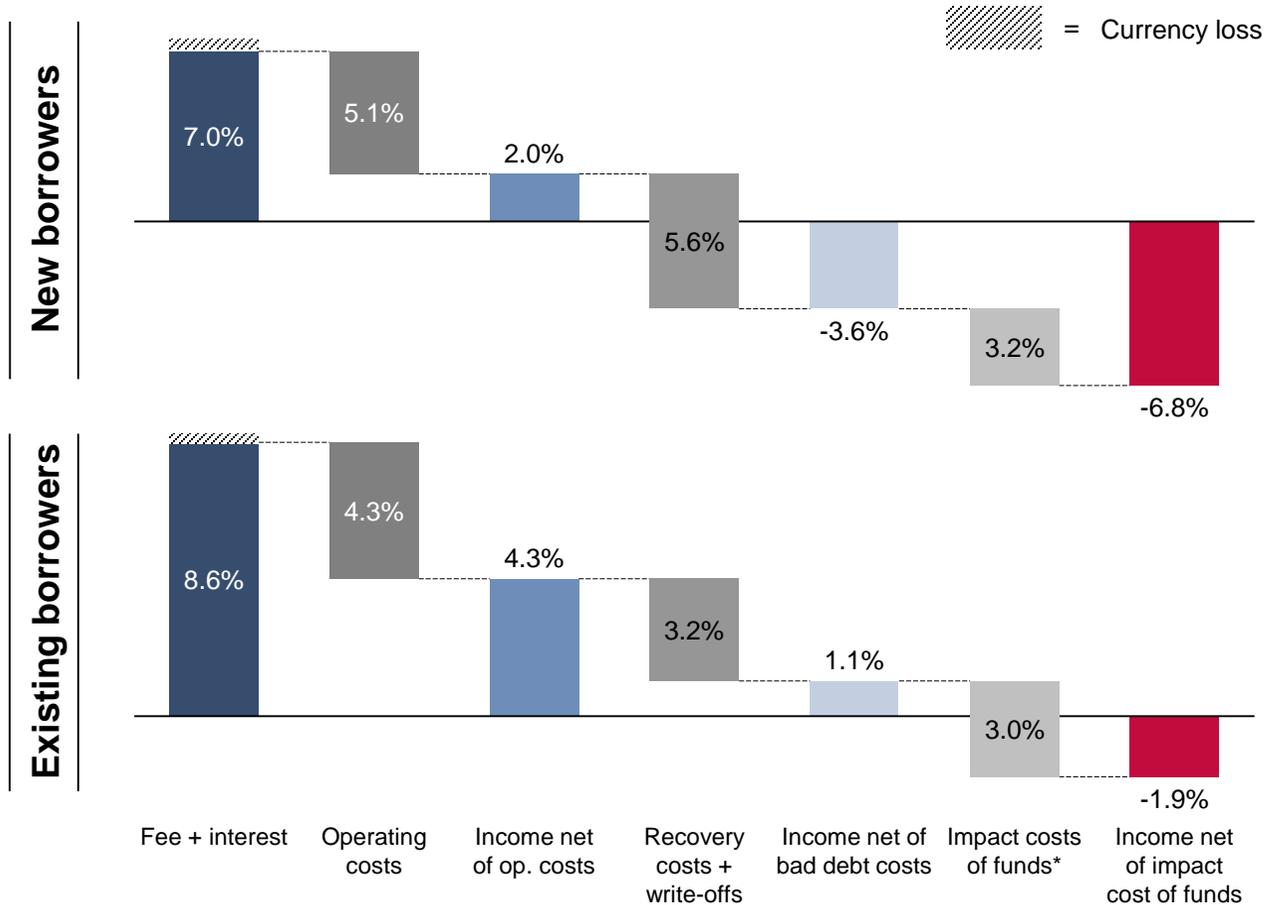
Appendix 7: Annualized yields for small vs. large loan sizes

Loan economics averages for all CSAF loans analyzed by loan size segments
Annualized yield (% per dollar p.a.)



Appendix 7: Annualized yields for loans to new vs. existing borrowers

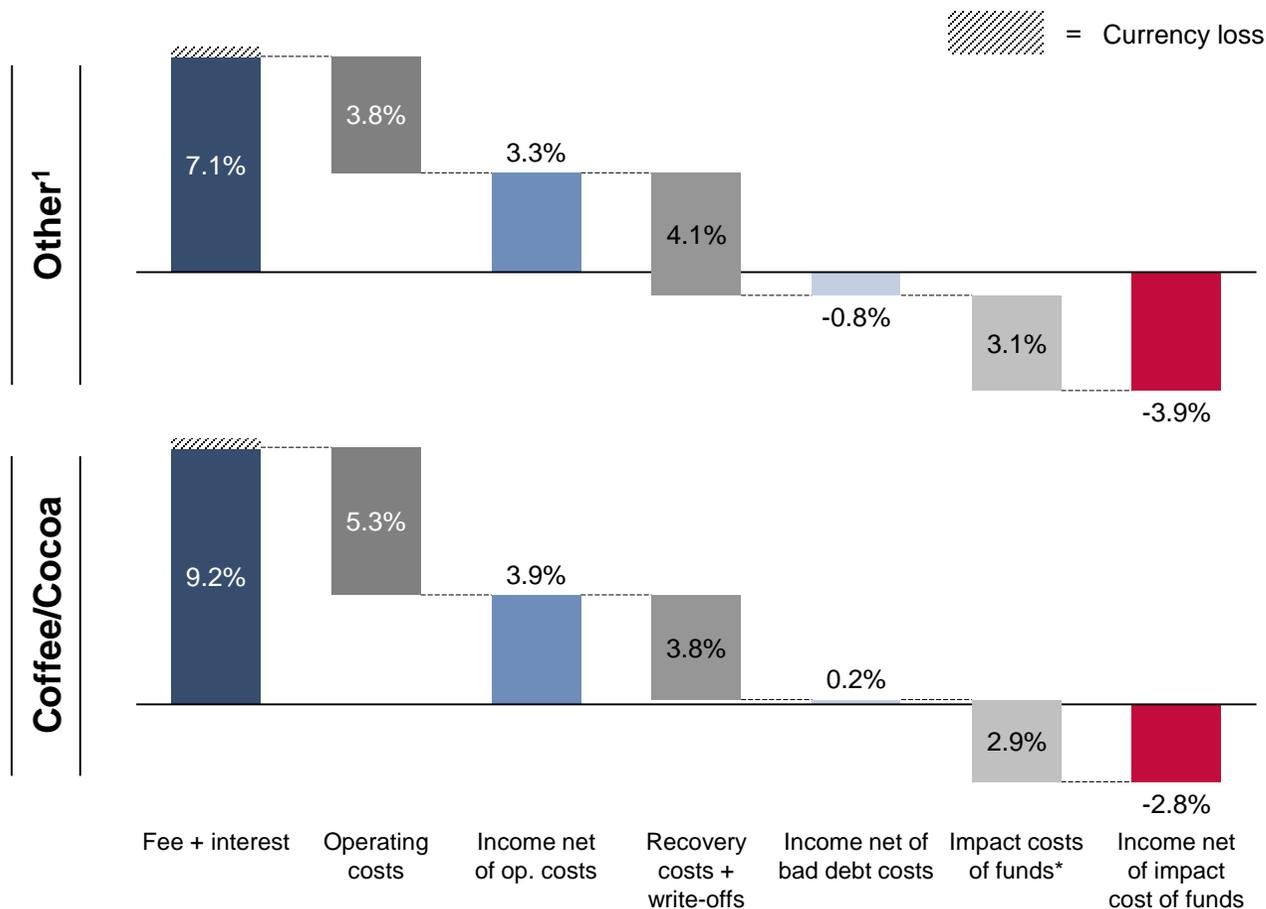
Loan economics averages for all CSAF loans analyzed by borrower type
Annualized yield (% per dollar p.a.)



Appendix 7: Annualized yields for loans in 'loose' vs. 'tight' value chains

Loan economics averages for all CSAF loans analyzed by value chain group

Annualized yield (% per dollar p.a.)



Appendix 7: Annualized yields for long-term vs. short-term loans

Loan economics averages for all CSAF loans analyzed by tenor segments

Annualized yield (% per dollar p.a.)

