Microfinance is widely considered to be an effective tool against poverty, but there have been few studies so far to measure whether these programs are the most cost-effective use of funds.

Evaluating microfinance is important because proponents argue that it is more financially viable than other means of fighting poverty because it can facilitate borrowing and reduce the costs of borrowing for individuals with limited collateral. On the other side, critics point to high default rates, reliance on subsidies, and the lack of hard evidence for the impact on households. So far, the few efforts to evaluate the impacts of microfinance institutions have produced mixed and even contradictory results.

This research brief, based on two papers by Joseph P. Kaboski and Robert M. Townsend, describes the first structural attempt to model and evaluate the impact of microfinance, drawing on data from the ongoing Townsend Thai Survey as it measures changes from the Thai Million Baht Village Fund program.

This structural approach enabled the researchers to undertake a quantitative interpretation of the data, to make predictions that counter actual policy, and to evaluate the program according to well-defined norms. On this basis, the authors determined that the program led to more consumption rather than investment and cost 20 percent more to achieve its benefits than a simple transfer of funds would have. However, there was considerable variance in how individual households were affected by the available credit, with some households reducing consumption in order to save up for larger investments and ultimately gaining substantially.

BACKGROUND
The Million Baht program was a groundbreaking initiative started in 2001 that used $1.8 billion in government funds to create village banks throughout Thailand. A million baht (approximately $24,000) was distributed to each of nearly 80,000 villages in the country, regardless of how many households there were. The initiative was adopted and implemented quickly, so there was no impact on expectations, and came between two rounds in the Townsend Thai Survey, an ongoing project to examine household finance in Thai villages. However, the quasi-experiment was quite different and less clean than typical randomizations, since the villagers themselves were allowed to organize the funds, while in randomizations there is greater control over what happens. So it is important not to extrapolate the results across all environments and microfinance interventions.
The transfers themselves represented about 1.5 percent of Thai GDP and substantially increased available credit. Kaboski and Townsend studied a panel of 960 households from 64 rural and semi-urban Thai villages as part of the annual and monthly Townsend Thai Surveys that began in 1997. For the purposes of this study, the authors used annual data from 1997 to 2003 within the dataset to gauge spending before and after the Village Funds began. The Million Baht Village Funds program started between the 2001 and 2002 survey years. Fund loans amounted to 80 percent of new short-term loans and one-third of total short-term credit in the 2002 Townsend Thai data. Counting the Village Funds as part of the formal sector, participation in the formal credit sector jumped from 60 to 80 percent.

Although village size varies considerably within the rural regions of the study, villages are administrative units and are often subdivided or joined for administrative or political purposes. In fact, village size patterns are not much related to underlying geographic features and vary from year to year in biannual data. So the authors viewed village size and the magnitude of the per capita intervention as exogenous—that is, variables outside their model. Finally, village size is not significantly related to pre-existing differences (in levels or trends) in the credit market or measures of the final effect of the lending program.

The analysis, which utilizes a structural model that is unique in its application, is driven by two broad classes of theories on credit-constrained environments: buffer stock saving models, based on the tendency of households to build up liquid assets because of borrowing constraints and uncertain income; and entrepreneurship and growth models, which predict that improved credit will spur business and agricultural investment and lead to growth in income.

**KEY FINDINGS**

Research found that the Village Funds led to increases in total short-term credit, consumption, and income growth from both business and labor. They also found, however, that overall asset growth declined and there was no impact on the level of investment. The program’s loans had a positive impact on wages, an important effect of the general equilibrium theory, which suggests that a positive input will impact other prices as an economy seeks equilibrium through the interaction of markets. These results are broadly consistent qualitatively with the models because the extra funds remove some of the constraints on consumption and lead to greater intermediation and growth.

However, the findings challenge some of the assumptions of microfinance proponents. The most discernible impacts from the program are on consumption rather than investment. It appears less cost-effective than a simple transfer mainly because funds may just go to prevent default and the increased borrowing limit actually hurts defaulting households.

The fact that consumption increased more than one-for-one with the credit injection, as correctly predicted, is a “smoking gun” for the existence of credit constraints. The extra funds were immediately used for consumption that had been pent up in the absence of available credit. This behavior strongly supports the predictions of the buffer stock savings model for the same reason. The injection of credit made it unnecessary to forego consumption in order to save for investment.

Microfinance appears to be less cost effective on average than simple transfers, in part because it saddles households with interest payments. This average, however, masks a considerable range of results, because some households gain substantially.

**THE SURVEY DATA**

Kaboski and Townsend focused on the effects of Village Funds on short-term credit (loans of one year or less), which made up the vast majority of loans in the program. The results examined fall into four categories:

First, the impact of the Village Fund credit on the short-term credit market, including its effects on total short-term credit; borrowing from other formal sources (i.e., the Bank for Agriculture and Agricultural Cooperatives, a rural development bank, and commercial banks); the stated reasons for borrowing (business investment, agricultural investment, fertilizer and pesticides, and
consumption); and measures of the tightness of credit markets (interest rates, default and informal borrowing).

Second, the effect on consumption overall and on its specific components, including grains, dairy, meat, fuel, clothes, home repair, vehicle repair, eating out, tobacco, alcohol (both in and out of the home), ceremonies, and education.

Third, the impact on household decisions regarding income and production, and in particular the overall growth in assets and income. The researchers also looked at the components of net income, such as agriculture, business, and wages; of investment, both agricultural and business; and input use, such as wages paid and fertilizer or pesticides. They also examined wages, calculated as the ratio of income over work days, by type of activity.

Fourth, differential impacts on households headed by women. Microcredit is often targeted toward women, and both theory and evidence suggest that impacts may differ across men and women on the grounds that women are more constrained by the absence of credit.

Results
The actual results of this quasi-experimental intervention were mixed. On the one hand, there were indeed significant increases in income growth and a change in the composition of income as a result of the intervention. As the theoretical models would predict, business and labor market income tended to increase, but agricultural income did not. On the other hand, there was no discernible change in business starts or business investment, and some evidence of an actual decline in assets in response to the program. This would suggest that changes in business and labor income were not driven by new investment and business starts.

There was an increase in the frequency of agricultural investments, but a reduction in the use of fertilizer and, again, no increase in agricultural income. Perhaps the most surprising result was that female-headed households behaved similarly to households headed by males. There were no significant differential impacts on female-headed households with respect to credit or agricultural income.

Theoretically, there are several potential explanations for reconciling these findings, but the ability to evaluate these empirically was limited. First, given the sample size, it may simply have been difficult to discern investments, since investment or business starts are highly variable and infrequent. Second, households report both increased labor income and higher payments to outside laborers in response to the program. Perhaps credit was most useful as working capital, allowing businesses and farms to hire more laborers and potentially use more intermediate inputs. That is, perhaps it is access to working capital rather than fixed entry costs that most constrain households in their business activities.

A third possibility is that credit offers consumption-smoothing, cash flow management, or limited liability, which, for a given level of investment, can change the composition of investment and labor decisions toward higher risk but higher yield sources of income. Indeed, the buffer stock model predicts a decline in low-return liquid assets (along with a move toward high-return investment). Evaluating this conjecture on the composition of investment is difficult, however.

A fourth potential explanation is that the program caused an increase in wages, a common implication of many of the macro-intermediation, entrepreneurship, and growth models.

The Models
The authors developed a model of buffer stock saving (when consumers save as a precaution because income is uncertain) and indivisible investment, and used it to evaluate the impacts of the Million Baht program. The model examines household decisions in the face of borrowing constraints, income uncertainty, and high-yield investment opportunities. Simulations from the model mirror the data in showing a greater increase in consumption than credit, which is interpreted as evidence of credit constraints. A cost-benefit analysis using the model indicates that some households value the program.
much more than its per household cost, but overall the program costs 20 percent more than the sum of these benefits.

In the classic buffer stock savings model, households build up stocks of liquid assets as a buffer against the borrowing constraints and income uncertainty they face. These theoretical features seem to correspond to the data in the study. But default was not uncommon (average credit in default is about 12 percent of average income), and households also made lumpy and illiquid physical investments that tend to pay higher returns than earned on liquid savings.

Evaluating the findings
The availability of credit under the Million Baht program increased total borrowing, and so crowding out of or substitution away from other sources was not a major problem. It may even be possible that credit increased one-for-one with the increase injection of available credit. At the same time, interest rates on short-term credit did not fall but may have actually risen slightly. This indicates that households were credit-constrained, since credit increased even though interest rates did not fall. Credit for the stated purpose of consumption is the primary type of borrowing that increased, however.

A second finding related to this is that consumption increased substantially, perhaps one-for-one with credit, indicating that credit constraints are particularly binding in consumption decisions. The surprising magnitude of this increase in consumption is consistent with buffer stock models. The ability to borrow has a big impact on consumption not only because it leads to an increase in consumption by borrowers who are currently constrained, but also by borrowers who are unconstrained at the moment but are, nonetheless, affected by the limited potential to borrow in the future.

These consumption and credit results are not consistent with an alternative story, in which households simply viewed the Village Fund transfers as a grant or aid program. This story would predict that, absent credit constraints, households would only consume the return on this one-time, transitory income shock rather than the full amount of the grant. However, in the initial years, consumption increased more than one-for-one with the size of the credit injection. Moreover, the loans could only be a substantial gift if they were not repaid. Credit from the program persisted at or above initial rates throughout the six post-program years, however, and the fraction of credit in default toward the Village Funds themselves was low: 4 percent or less, except for one year when default was 9 percent.

Furthermore, the positive impacts of Village Fund credit on consumption and income growth were confined to the initial years of the program even though credit and short-term credit grew throughout the sample. These transitional impacts are qualitatively consistent with the dynamics in buffer stock savings model. Moreover, default (on all types of credit) did increase, but in a way consistent with the buffer stock story. Specifically, it did not increase in the first year, when more credit was available, but only in later years when loans needed to be repaid.

Intermediation and growth models
Models of macro-intermediation, entrepreneurship and growth make up the second broad class driving the research. Such models have been shown to perform relatively well in fitting the long-run Thai growth experience. The implied connection between access to finance, entrepreneurship and growth is often a central motivation for microfinance programs as poverty alleviation interventions. Microfinance programs typically cater to poor people who lack access to other forms of intermediation in the hope that the poor are financially constrained and have high returns to investment. Women, in particular, are often targeted under the belief that they have less access to credit, fewer outside options in the labor market, and therefore the highest returns to private entrepreneurship.

A perfect credit model, such as a permanent income model, would have trouble explaining the large increase in borrowing, since reported interest rates on borrowing did not fall as a result of the program. Similarly, even if households treated loans as a shock to income rather than a loan, they would only consume the inter-
est of the shock (roughly 7 percent) perpetually. Also, households were not initially more likely in default after the program was introduced, despite the increase in borrowing. Finally, household investment is an important aspect of household behavior. There was an increase in the frequency of investment, but no impact on the level of investment. This is a priori puzzling in a model with divisible investment, if credit constraints are deemed to play an important role.

Comparing alternatives
The structural models developed in the papers sheds light on many of these findings. In addition, the normative evaluation compares the costs of the Million Baht program to the costs of a direct transfer program that is equivalent in the sense of providing the same utility benefit. The heterogeneity of households plays an important role, and indeed the welfare benefits of the program vary substantially across households and villages.

Essentially, there are two major differences between the microfinance program and a well-directed transfer program. First, the microfinance program is potentially less beneficial because households face the interest costs of credit. In order to access liquidity, households borrow more, and while they can always carry forward more debt into the future, they are left with larger interest payments. Interest costs are particularly high for otherwise defaulting households, whose debts are augmented to the more liberal borrowing limit, and so they bear higher interest charges.

On the other hand, the microfinance program is potentially more beneficial than a direct transfer program because it can also provide more liquidity to those who potentially have the highest marginal valuation of liquidity by lowering the borrowing constraint. Hence, the program is relatively more cost-effective for non-defaulting households with urgent liquidity needs for consumption and investment.

Quantitatively, given the sharp increase in default and the high interest rate (ranging from 2 to 12 percent, with an average of 7 percent), the benefits (i.e., the equivalent transfer) of the program are 20 percent less than the program costs, but this masks the interesting variation among losers and gainers.

Conclusions
The Million Baht Village Fund injection of microcredit in villages had the desired effect of increasing overall credit in the economy. Households responded by borrowing more and consuming more, yet earning more as well. The Village Fund credit had a short-term effect of increasing future incomes and making business and market labor more important sources of income. The increased borrowing and short-lived consumption response, despite no decline in interest rates, point to a relaxation of credit constraints. The increased labor income and especially wage rates indicate important spillover effects that may have also affected non-borrowers.

The large increase in borrowing and consumption are broadly consistent with buffer stock models of credit-constrained households. This analysis shows that the composition of consumption increases is not only toward luxury goods but also repairs. Similarly, the increase in income, and the increasing importance of business and labor income relative to agricultural income, is consistent with models of intermediation and growth. The positive impact on wages, as predicted by the general equilibrium model of a ripple effect through the interaction of markets, offers more credence to these growth models, where rising wages play an important role.
REFERENCES

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Primary Studies:


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