What helps, what hurts?
The impacts of debt moratorium on farm households' debt dynamics

Lathaporn Ratanavararak
Sommarat Chantarat

PIER
PUEY UNGPHAKORN INSTITUTE
FOR ECONOMIC RESEARCH

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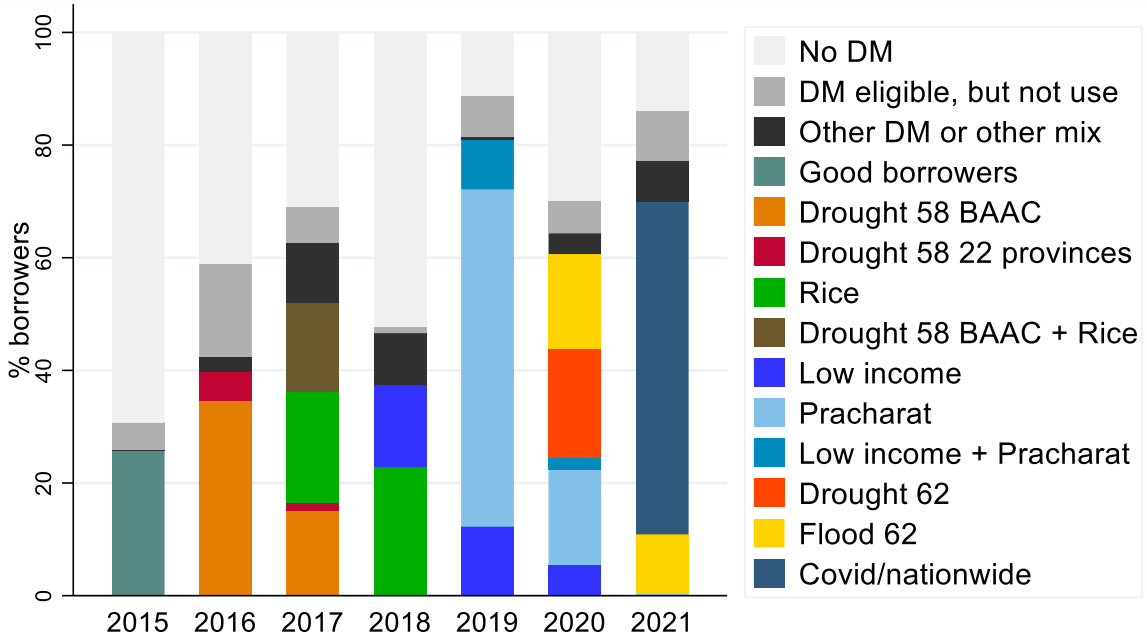
Farmer debt dynamics and debt moratorium

- Rising debt accumulation dynamics
  among Thai farmers over the past decade
- Widespread production shocks
  affecting farmers' ability to repay
  → Debt moratorium (DM) as main safety net
- But too many debt moratorium programs
  - 43.6% of BAAC borrowers in DM on average
  - 1/3 are risk contingent, the rest mainly are weakly/non-targeted programs
  - Hence, widespread participation: 77.1% of farmers in DM* and 41.4% in DM more than 4 years**

% of borrowers by DM programs



Others are Flood 59, NPL borrowers, fruit farmers, cassava farmers, and farmers in 3 southern provinces

What are potential impacts of DM on farmers' debt accumulation dynamics and delinquency? Who have DM helped or hurted?

* As of March 2021
** Over the period 2015-2021

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Potential impacts of debt moratorium

1. DM reduces repayment burden

- DM could reduce delinquency
- DM could help shock affected households and/or households struggled with high debt to move on economically → more ability to repay loan in the future → reduce future debt accumulation

2. But with many DM being offered across the board

- moral hazard → increasing debt accumulation especially when DM households can also borrow more

Our contribution

- Existing literatures
  - Explore specific debt relief policy and mainly use IV/RD on survey data: Tambunlertchai (2004), Gine and Kanz (2017), Kanz (2016), Mukherjee et al. (2018)
  - Mostly found that debt relief programs → greater defaults and moral hazard, with no offsetting significant positive impact on savings, consumption, investment, and productivity

- Our paper attempts to quantify the impacts of DM policies on farmers' debt accumulation dynamics and delinquency
  - Uses large BAAC loan-level panel data of 1 million randomly selected rice farmer borrowers over 8 years merged with household-level farmer registry data
  - Considers all 14 DM policies over 8 years and intensity of DM participation
  - Explores distributional impacts, heterogeneities and mechanisms

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Data

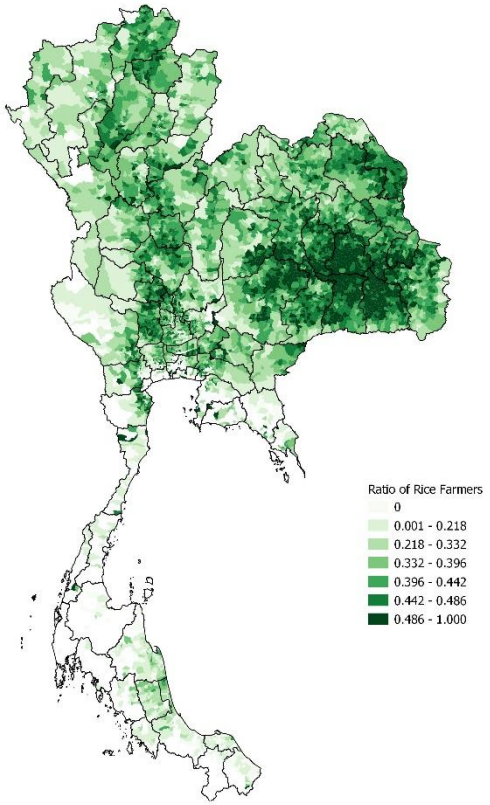
BAAC data

- 1 million randomly sampled rice farmers
- 8-year panel (2014-2021)
- Loan data: types, outstanding (no IR), delinquency, DM

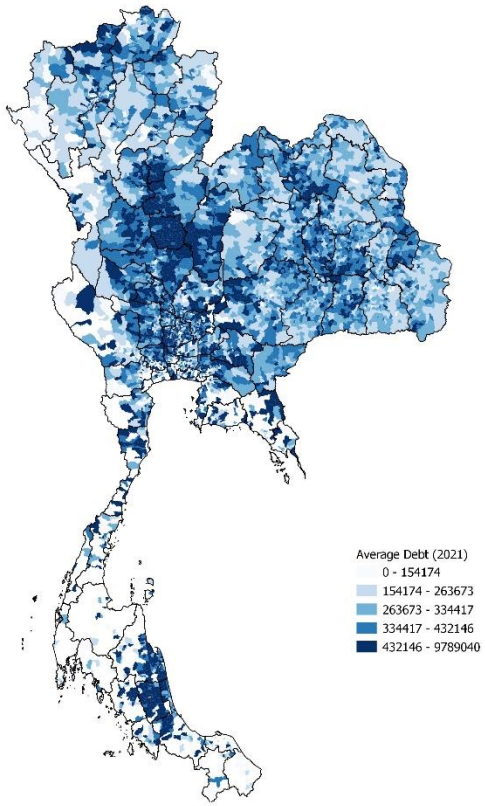
Farmer registration data

- Merged at NID
- Farm/farmer/farming characteristics
- Shocks and risk (production losses)

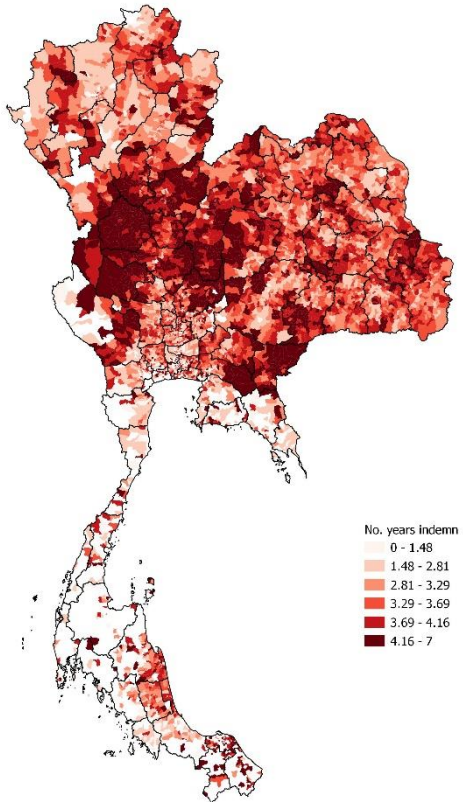
Sampled borrowers/total



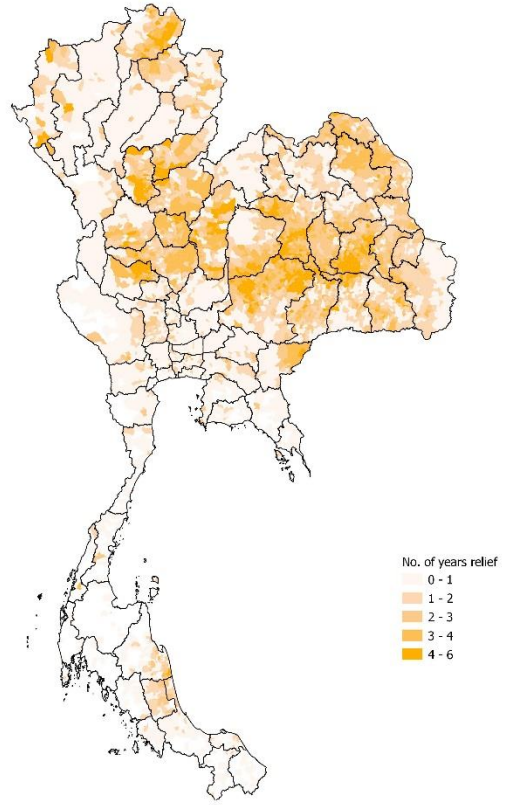
Average debt outstanding



Average years in DM



Average years with disasters



Only Tambon with more than 5 rice farmer borrowers are included.

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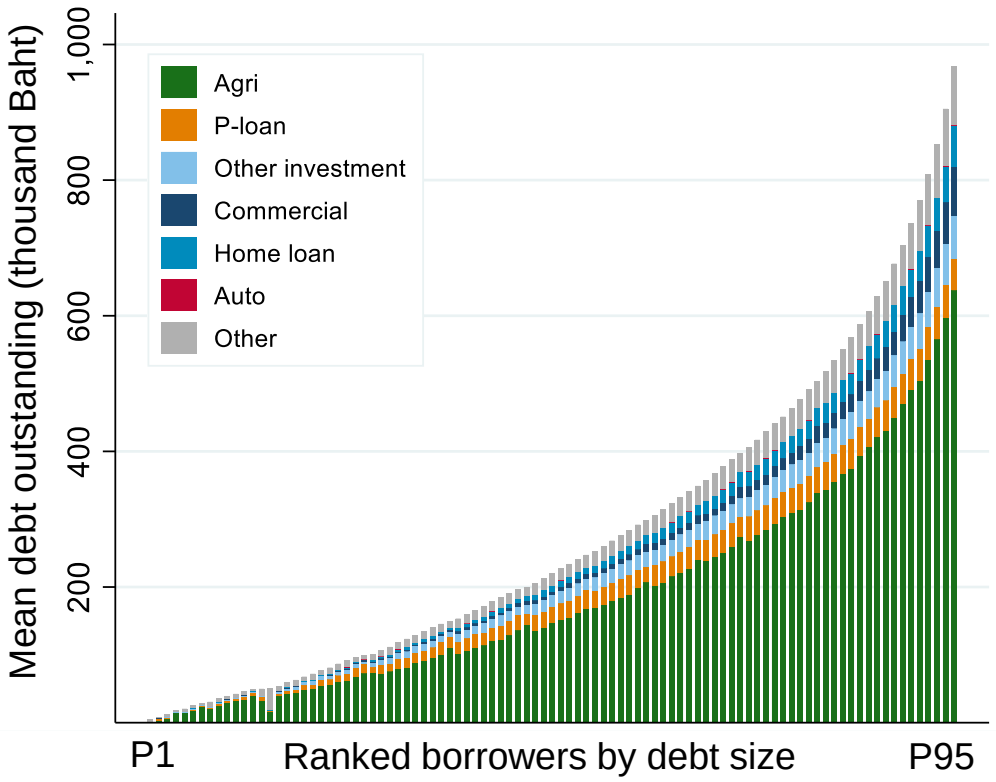
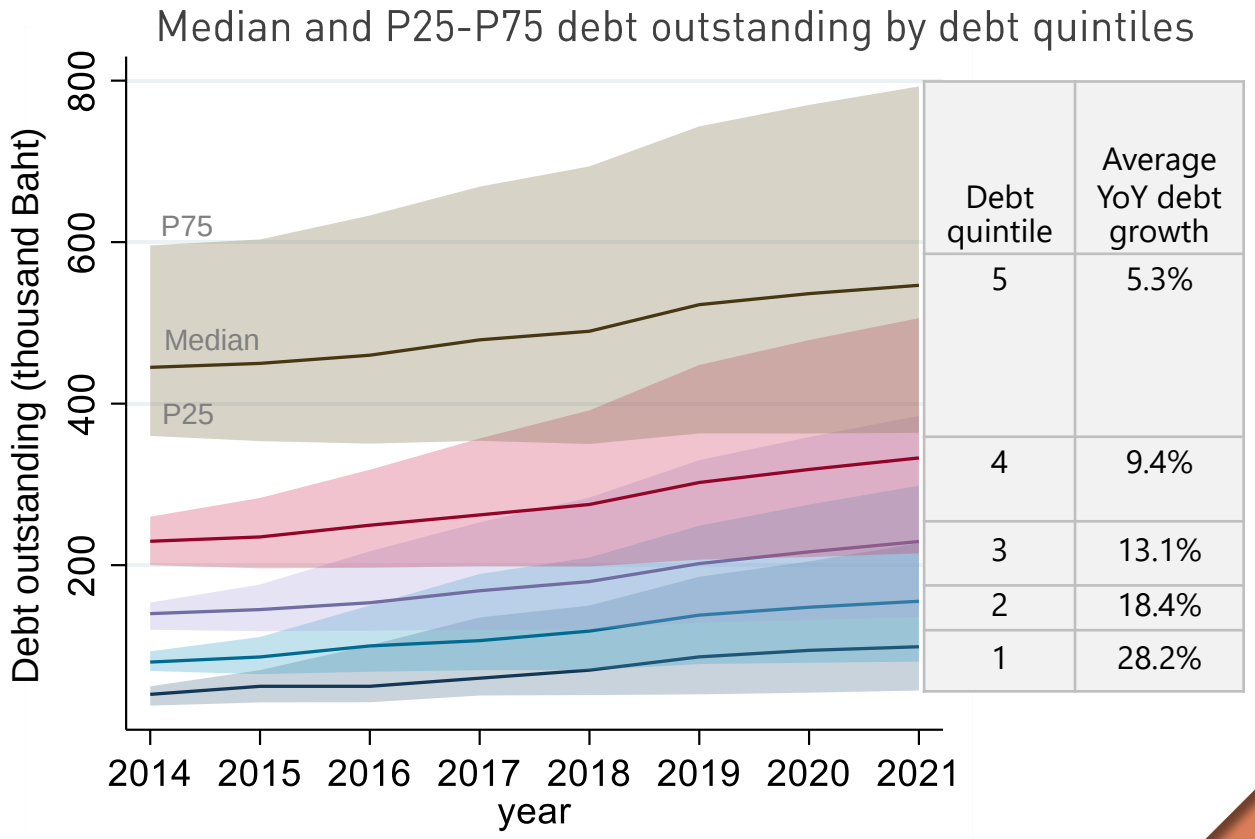
Farmers' debt distribution and dynamics

- Large debt outstanding per household
  - In 2021, mean = 345,758 Baht; median = 237,638 baht
  - Majority (66.3%) are agri loan



- High debt growth especially amoung households in lower debt quintiles



Debt quintile	Average YoY debt growth
5	5.3%
4	9.4%
3	13.1%
2	18.4%
1	28.2%

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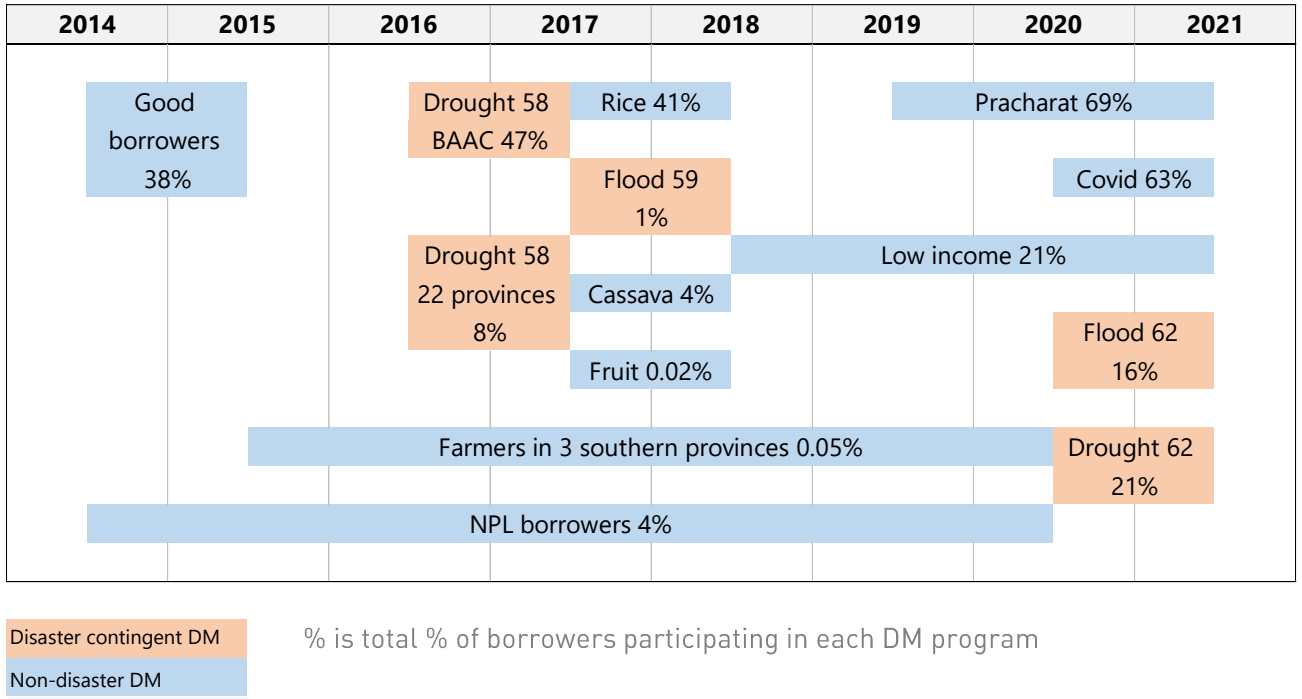
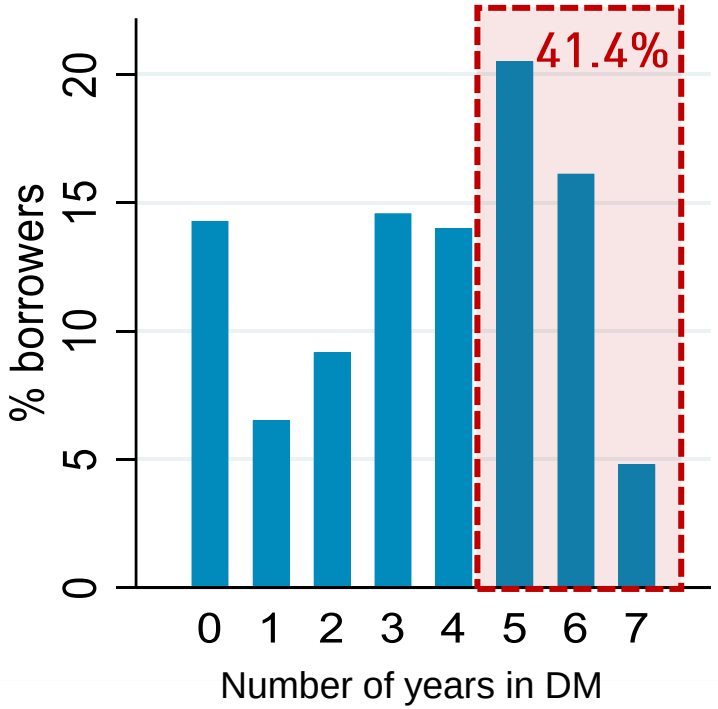
Debt moratorium policies

- Many programs each year
  - Risk-contingent vs. others
- Continuously available ➔ potential for hoping from one to the other
- High intensity of DM participation



% is total % of borrowers participating in each DM program



Participation in DM are identified as borrowers who are eligible for DM programs and debt outstanding does not decrease more than 10,000 Baht from previous year because this might suggest that the borrowers pay back the loan even though they are elibile for debt holiday; hence, they should be classified as borrowers who did not exploit the DM given.

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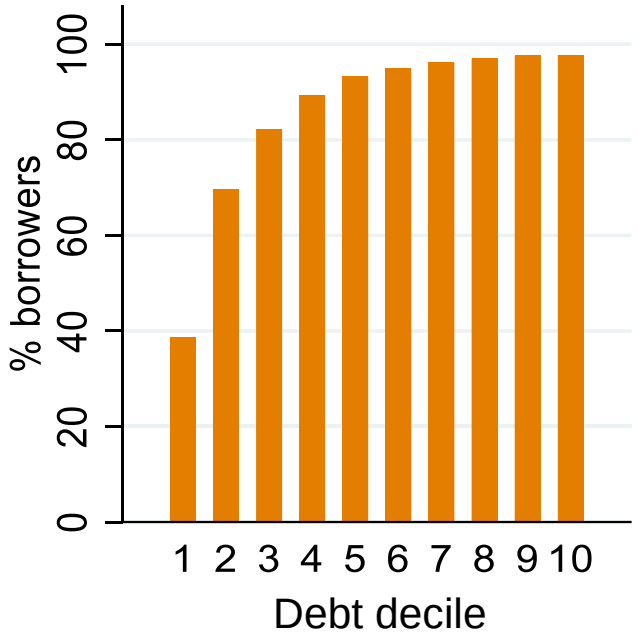
Farmers' participation in DM

- High DM participation among households with large debt



- Overall mean test in 2015 shows clear selection into DM programs

DM borrowers tend to be higher risk, with larger debt, but more collateralized and less delinquent!

	DM borrowers		Non-DM borrowers		Difference		
	Mean	SD	Mean	SD	Mean	SE	t-stat
Farmer/farm characteristics							
Age (year)	**52.9**	11.4	**54.3**	13.5	-1.31	0.05	-24.779***
Education: elementary or lower	**45.8%**	49.8%	**45.4%**	49.8%	0.39%	0.20%	1.964**
Planting area (rai)	**20.5**	16.9	**21.2**	16.2	-0.68	0.07	-10.259***
Landowner (% borrowers)	**81.1%**	39.2%	**82.1%**	38.3%	-1.04%	0.15%	-6.852***
Irrigation (% borrowers)	**13.4%**	34.1%	**19.0%**	39.2%	-5.57%	0.15%	-36.335***
High diversification	**39.1%**	48.8%	**34.0%**	47.4%	5.19%	0.19%	27.637***
Participating in agri growth policy (% borrowers)	**13.2%**	33.8%	**14.0%**	34.7%	-0.87%	0.14%	-6.343***
Receiving relief transfer (% borrowers)	**6.0%**	23.7%	**4.8%**	21.4%	1.17%	0.09%	13.669***
Region							
Central (% borrowers)	**7.5%**	26.4%	**10.6%**	30.8%	-3.12%	0.12%	-25.889***
Northeast (% borrowers)	**67.6%**	46.8%	**63.1%**	48.3%	4.52%	0.19%	23.739***
Loan characteristics							
Debt outstanding (Baht)	**228,590**	269,537	**107,751**	220,874	120,839	891	140***
Deposit (Baht)	**23,040**	98,245	**43,640**	199,702	-20,600	763	-26.999***
Number of loan accounts	**2.8**	1.7	**1.3**	0.8	1.46	0.00	420***
Delinquency (% borrowers)	**9.8%**	29.8%	**19.1%**	39.3%	-9.26%	0.15%	-60.752***
DR/TDR (% borrowers)	**5.5%**	22.7%	**7.9%**	27.0%	-2.48%	0.11%	-23.539***
Collateralization (% borrowers)	**61.3%**	48.7%	**46.4%**	49.9%	14.9%	0.20%	75.556***
Having p-loan (% borrowers)	**37.8%**	48.5%	**9.8%**	29.7%	28.0%	0.13%	220***

Stats are from 2015 data; High diversification = planting multi crops and having off-farm income

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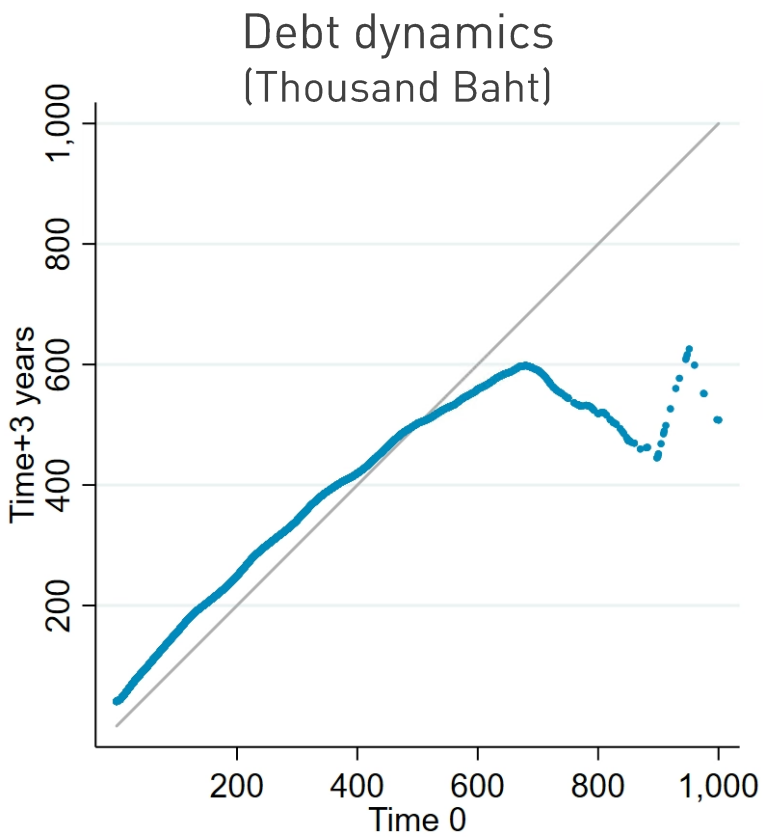
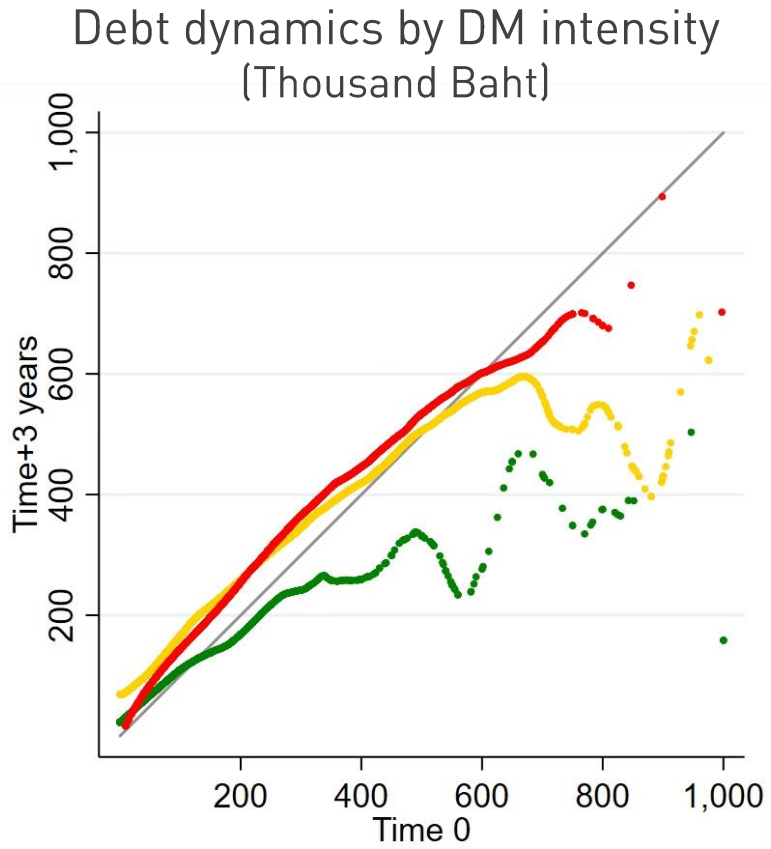
Farmers' debt dynamics and DM

- Nonparametric estimation shows clear L-T steady state level of debt



- Higher level of L-T steady state of debt with increasing intensity of DM participation!



But part of this could be due to selection into DM!

Red = always in DM

Yellow = in DM, but not every year

Green = not in DM

- Randomized 5,000 borrowers are employed; debt value above 95 percentile are excluded
- Results for interval time +4 years are similar
- Results on debt to deposit ratio and debt to plant area ratio are similars; with clear steady states level of debt ratios and distinction among varying intensity of DM participation
- Debt dynamics patterns do not clearly differ among varying education level, different types of diversification (on-farm/off-farm income,mono vs. multi crop), being in DR/TDR or not, and different levels of disaster risk

Identification strategies

$$Y_{i,t+\tau} = \beta DM_{i,t} + \delta_i + \theta_t + \alpha X_{i,t} + \varepsilon_{i,t}$$

$Y_{i,t+\tau}$: debt growth, cum debt growth, growth of debt to plant area ratio, delinquency (0/1) over τ =1,3,4 years

$DM_{i,t}$: Participation in DM (0/1), years in DM dummies (non-linear intensity impact)

δ_i, θ_t: Household fixed effect and time effect

$X_{i,t}$: Debt outstanding, deposit, number of loan accounts, number of new loan accounts, being under DR/TDR (0/1), having p-loan (0/1), having only working capital, collateralization (0/1), size of planting area, landowner (0/1), irrigation (0/1), receiving relief transfer (0/1; proxy for shocks), having crop insurance (0/1)

Identification strategy

- Panel regression to control for unobserved individual characteristics that might affect DM participation
- Time varying controls ($X_{i,t}$) to control for time-varying factors that might affect trend of individual outcomes
- Estimates impact separately by debt decile, risk group to control for selection on level of debt and risk
- Robustness checks

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Overall impacts of DM

Result#1: "The help" → DM significantly decrease delinquency!

- Delinquent probability reduces by 24% the following year and 53% in 3 years after

Result#2: "The hurt" → Participating in DM results in significant increase in L-T debt growth

- Debt growth increases by 8.2% and 7.3% in 3 and 4 years after

Impacts on delinquency

	t+1	t+3
DM_it	**-0.240*** **	**-0.532*** **
	(0.007)	(0.171)
Regression controlled for time-varying characteristics Xit	RE	FE
Number of observations	4,000,199	107,932

Impacts on debt growth

	t+1	t+3	t+4
DM_it	**-0.012*** **	**0.082*** **	**0.073*** **
	(13.230)	(6.973)	(3.150)
FE regression controlled for time-varying characteristics Xit			
R-squared	0.162	0.274	0.261
Number of borrowers	940,495	809,497	736,365

- All growth variables are winsorized at 99 percentile.
- In the estimation of impacts on delinquency, convergence is not achieved in the FE model for t+1; hence RE model estimates are reported instead. Convergence is not achieved for both FE and RE regressions for the t+3 model; the FE is reported since it is more preferable model specification.
- Results when using growth of debt to plant area ratio as outcomes are similar.

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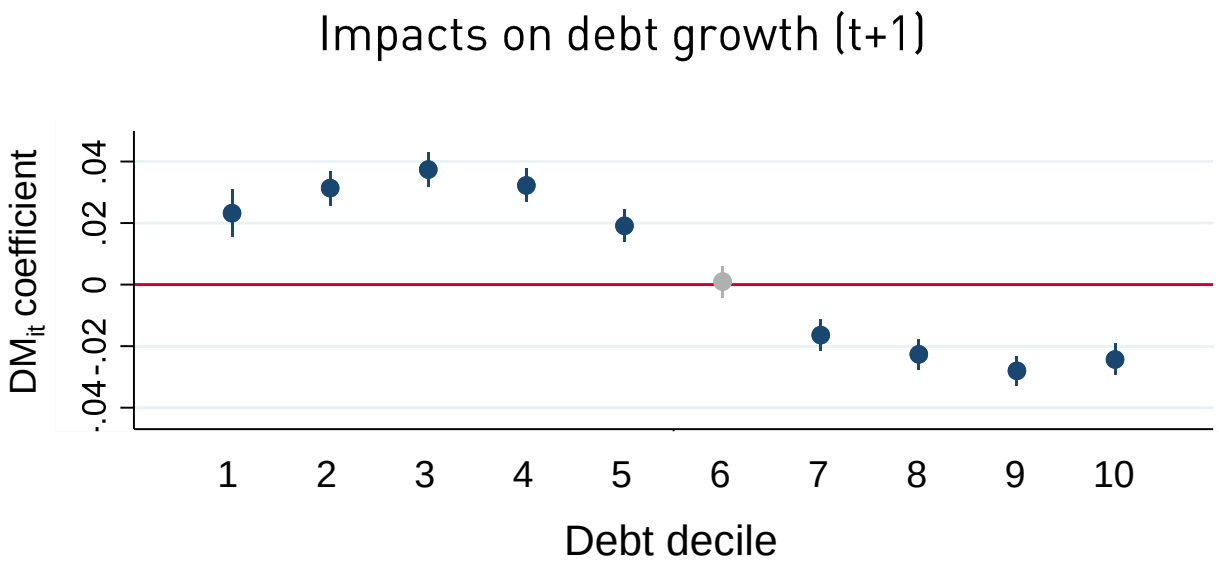
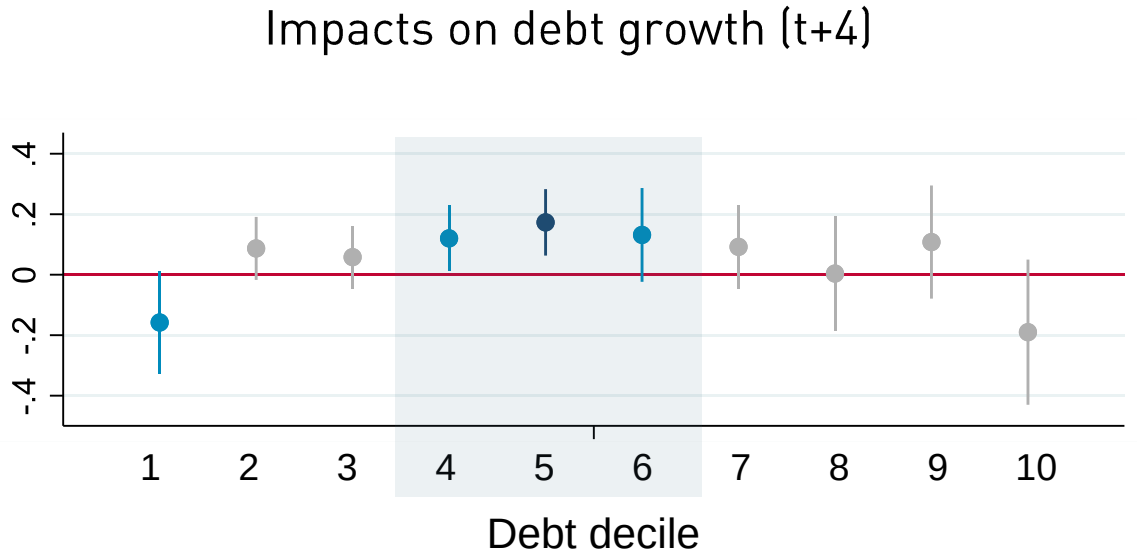
Non-linear impacts by debt decile

Result#3: DM increases L-T debt growth among medium debt deciles but could potentially decrease debt growth among the top deciles

- For households in debt deciles 4-6, DM significantly increases debt growth by upto 20% in 4 years after participation!





*** p<0.01, **/* p<0.1, Statistically insignificant

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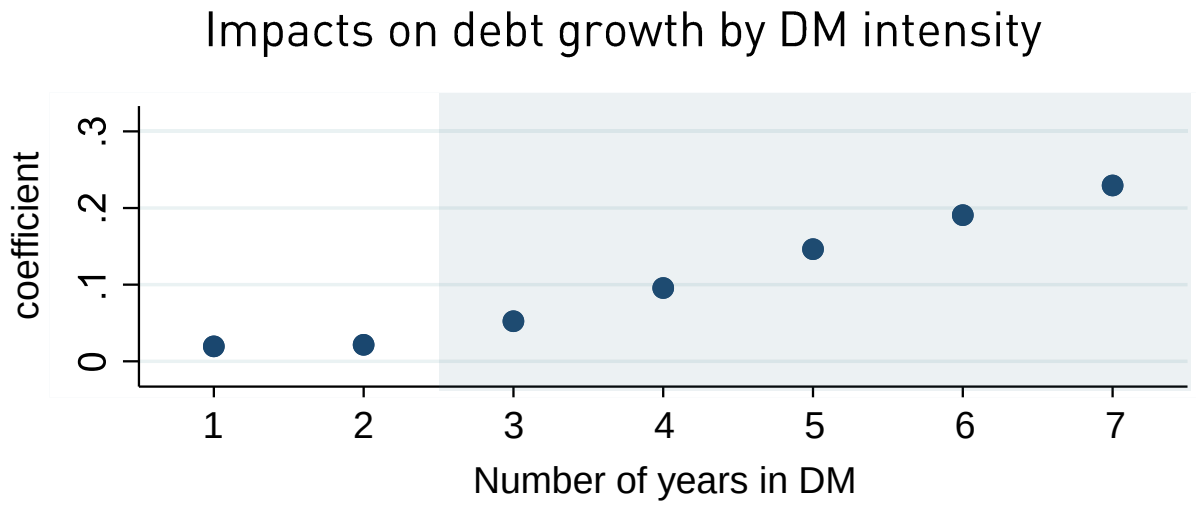
Increasing impacts by DM intensity

Result#4: The impact on debt growth increase significantly with intensity of DM participation

- Additional year in DM beyond 2 results in 5% increase in debt growth.
- Staying in DM more than 6 years results in total of 25% increase in debt growth



*** p<0.01, **/* p<0.1, Statistically insignificant

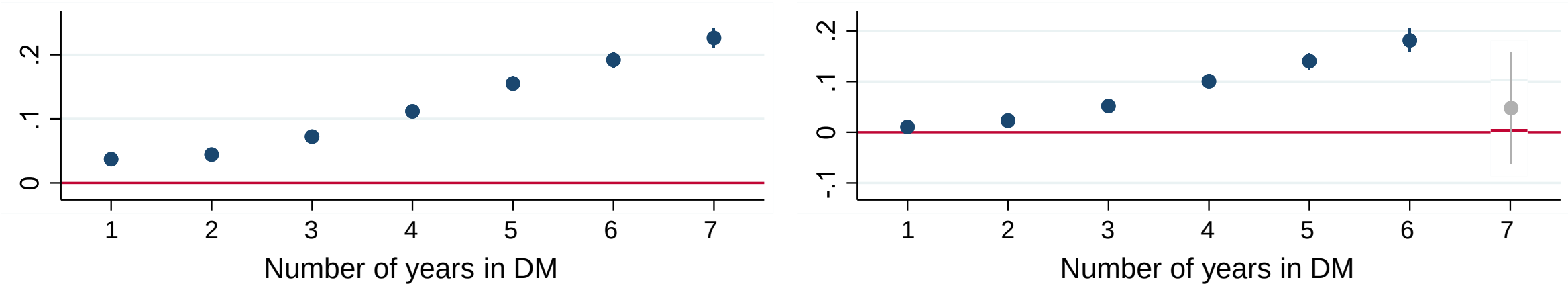
- Results shown are from t+1 year on year growth model specification.
- Number of years in DM variable is included in the model as dummies. Results when using number of years in DM as continuous variables are similar.

Shock affected households

Result#5: Similar impacts even when estimate separately b/t households with/without shocks

- And similar impact between risk-contingent DM vs. others (results not shown here)

Impacts on debt growth by DM intensity



*** p<0.01, **/* p<0.1, Statistically insignificant

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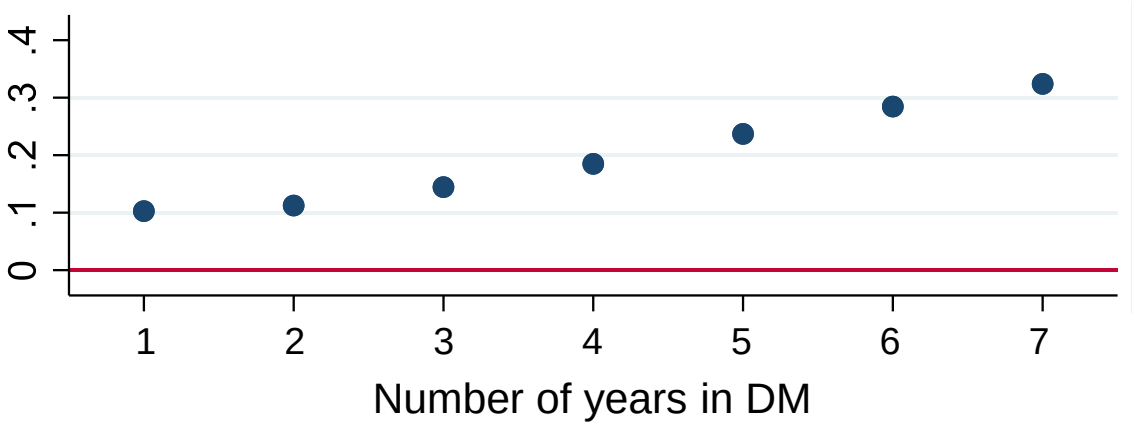
Why DM→ increasing debt growth? New loan creation during DM

Result#6: The increasing debt growth impacts only occurs among borrowers who took out new loans during in DM!

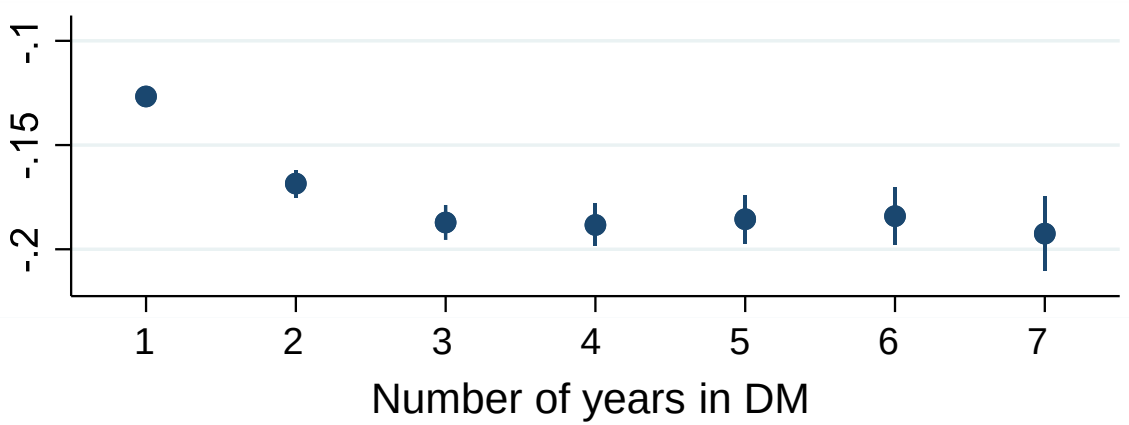
Borrowers who received new loan during DM

(66%)



Borrowers who did not receive new loan during DM

(34%)



- The remaining 14% are borrowers who did not participate in DM, which are included in both regressions
- Results shown are from t+1 year on year growth model specification.

*** p<0.01, **/* p<0.1, Statistically insignificant

Takeaways

1. DM policies could potentially HELP households in the top debt deciles
   - decrease delinquency and debt growth
2. DM policies could rather HURT other groups especially the middle deciles
   - increase debt growth toward a vicious cycle of "debt trap"
   - especially when policies are prolonged and allow DM borrowers to keep borrowing
3. Revisiting DM policies is critical
   - Should limit to short-term relief only
   - Should limit new loan made by DM borrowers
   - Should be targeted to help top debt deciles

Thank you

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