

Financial Development

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Introduction: A Practical Talk, A Policy Guide

- ❖ A conceptual framework for thinking about financial development and appropriate policy
- ❖ Methods and an operation tool kit for actual implementation
- ❖ Featured examples underway in various countries
- ❖ Can, indeed should be, done in yet other countries, here's how

Outline of the Talk and the Key Steps

- ❖ Data
- ❖ Theory/modeling tools
- ❖ Example of theory/data combination in practice: With specific, focused policy recommendations
- ❖ Evaluation of actual policies and counter-factual policies using these frameworks
- ❖ Market place exchanges: Intermediation platforms and policy recommendations for financial innovation
- ❖ Optimal design of payments system: Potential problems and a role for policy
- ❖ Summary and conclusions

Data: Townsend Thai Project

❖ Annual

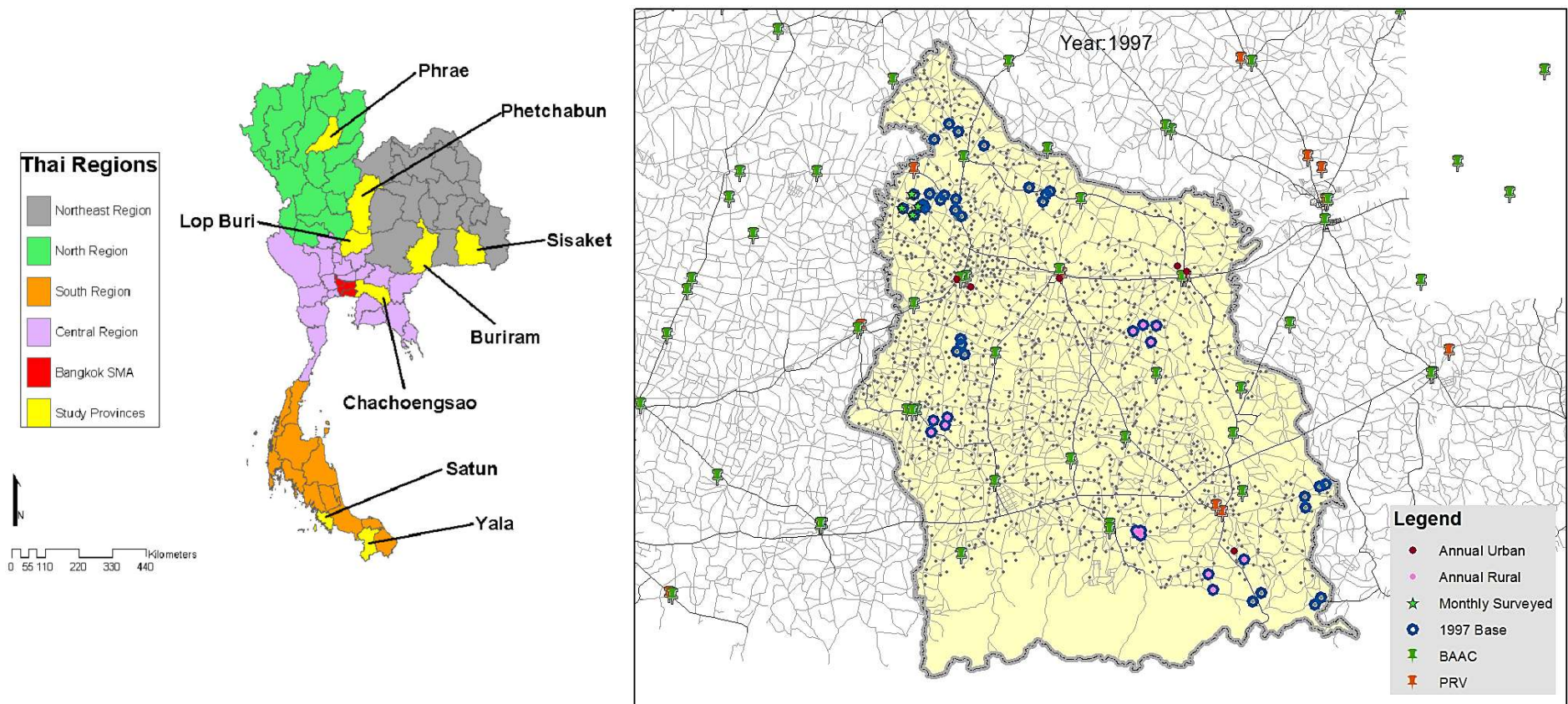
- Started in rural areas in 1997 with 192 villages
- Resurvey in 64 villages every year since 1998
- Expanded to North and South in 2003 and 2004

❖ Urban

- Extended to Urban Areas in 2005

❖ Monthly

- Started in 1998, 720 new households
- Survey Design, 16 villages



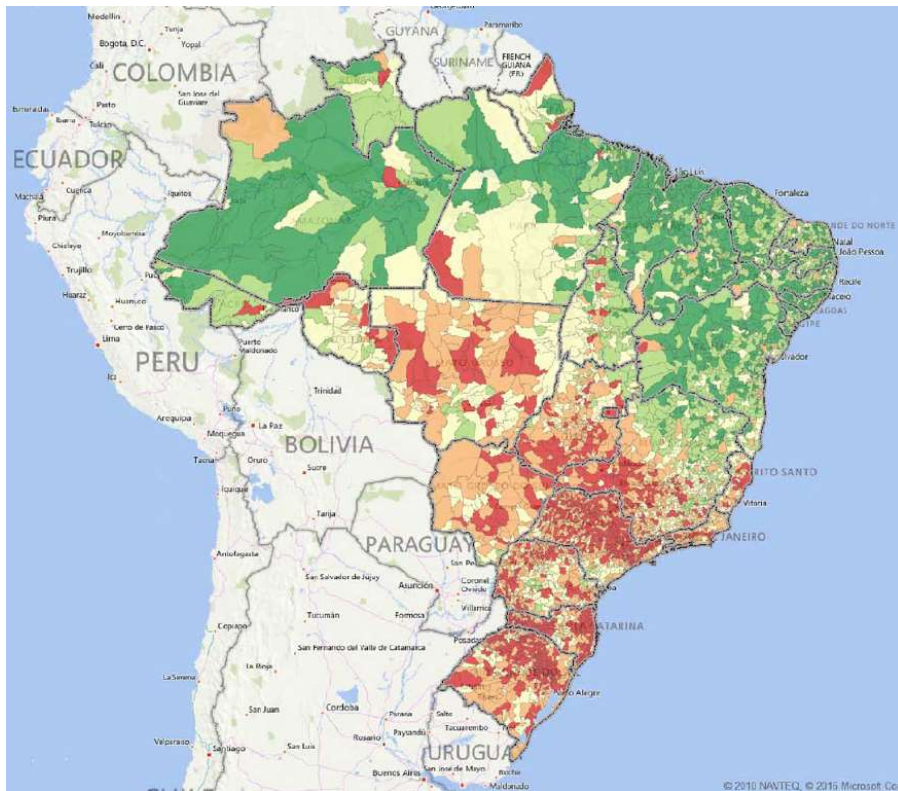
Use in Other Countries

- ❖ Do not need long panel, can get started right away, as in 1997 baseline
- ❖ Past (a few focused surveys)
 - Mexico
 - Evaluation of Financial Services, Bansefi
 - Household and institutional instruments directly – 2004, 2005
 - Chile
 - Central Bank Household Financial Survey
 - Three major waves – 2007, 2011, 2014
 - And three smaller waves – 2008, 2009, 2010
 - With rotating panel
 - Universidad de Chile Microenterprise Survey
 - Panel – 2009, 2011
- ❖ Present and future (long term)
 - Yale EGC-CMF Tamil Nadu Socioeconomic Mobility Survey
 - Baseline data began in 2010, resurvey 10,000 households over 15 years
 - Yale EGC-ISSER Ghana Panel Survey
 - Baseline data began in 2009, resurvey 5,000 households over 15 years
 - Kavli Human Project
 - To start in 2017, resurveying 10,000 New Yorkers over the next 20 years

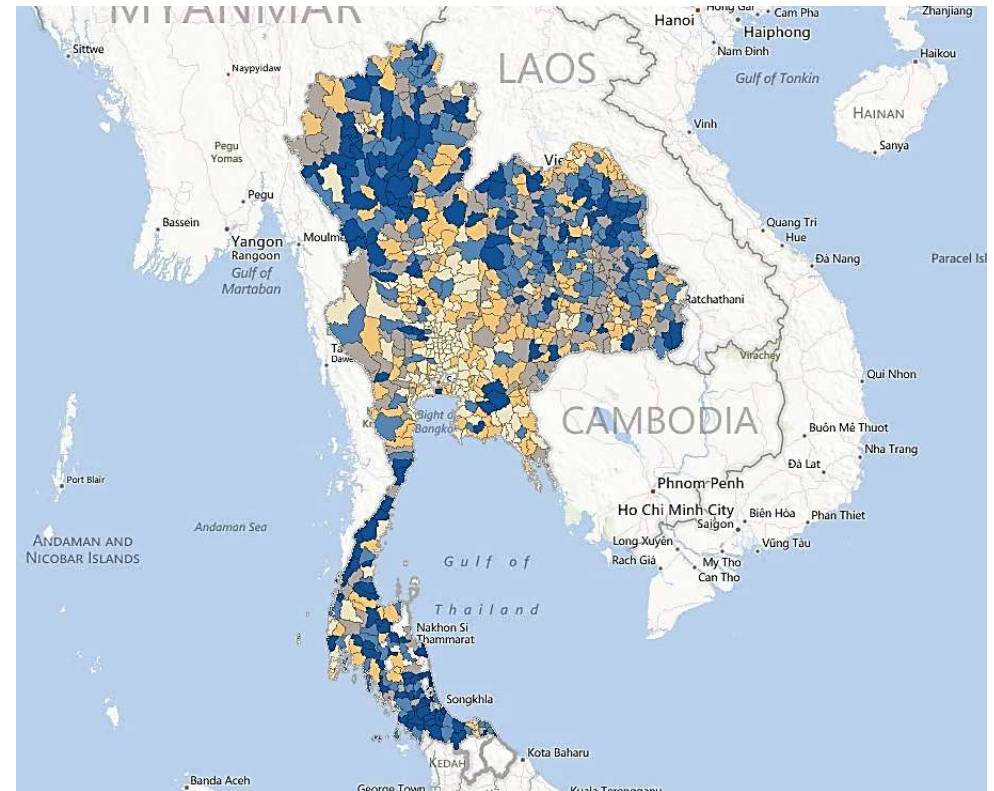
Comprehensive Online GIS Database Archive

❖ <http://townsend-gis.mit.edu/brazilgis/>

❖ <http://townsend-gis.mit.edu/thaigis/>



- Census
- Ag. Census
- PRODES



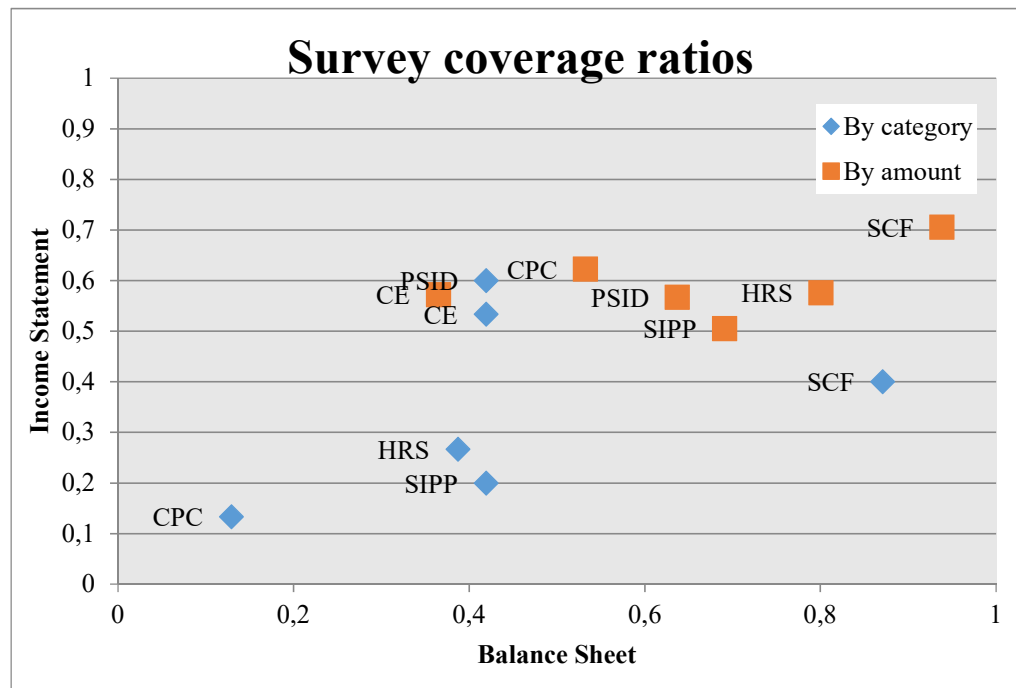
- SES
- LFS
- CDD
- Census
- Manufacturers
- Branch Locations

- BoT Data
- GPP
- HMS
- MIS
- TEI

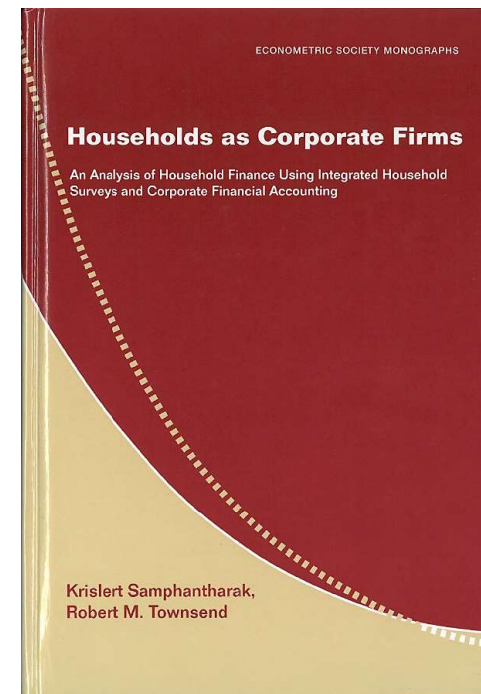
Integrated Financial Accounts and Payments

- ❖ Financial accounts and integrated surveys: income, balance sheet
- ❖ Evaluation of U.S. data sets, none are well integrated
- ❖ Federal Reserve Bank, Boston: payments diary and survey, cash
- ❖ Innovation: combined payments, liquidity data with integrated financial accounts

FIGURE 3 – Financial statement line-item coverage ratios for U.S. surveys



Source: Samphantharak, Schuh & Townsend (2016)



Source: Samphantharak & Townsend, 2006

Data: Alternative Sources, the Wave of the Future

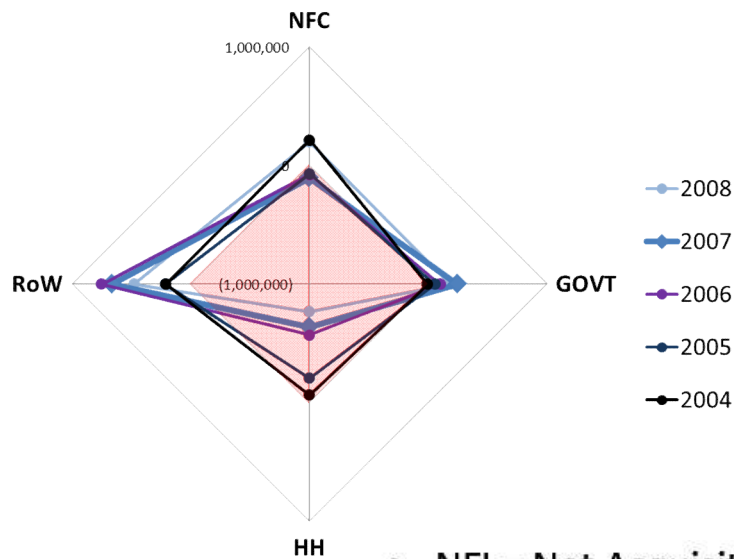
❖ New data sources

- Mobile phone data
- Mint (www.mint.com), Plaid (www.plaid.com)
 - Household financial management and analysis
- Aggregators –Yodlee (www.yodlee.com)
 - Creating databases from these sources
- Existing financial markets and institutions
 - Municipal bond transactions, CDS, interbank borrowing, others
- Collaborative agreements with central banks and regulators
 - For controlled use of internal bank registry data with co-authors
 - Brazil, Spain, others

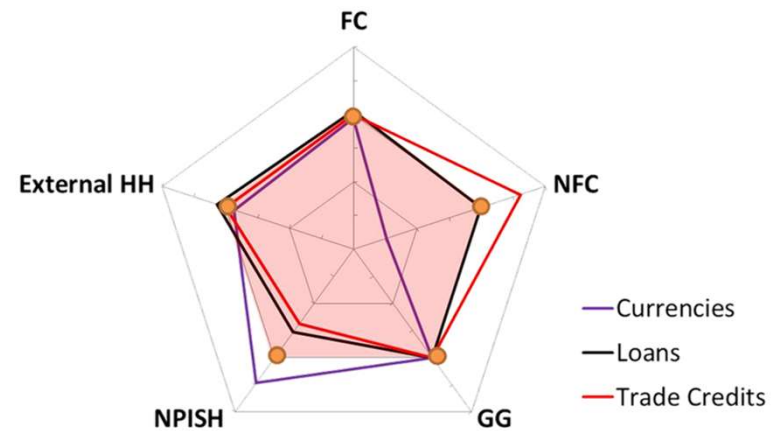
Mapping Financial Systems: The Overall Goal

- ❖ Traditional sectors
- ❖ Flow of funds accounts
- ❖ Featuring bank and non-bank financial intermediaries
- ❖ Underway in England and U.S.
- ❖ Flows within sector, too
- ❖ Balance sheet, income, cash
- ❖ By geography
- ❖ Impact of monetary policy at local level

Flow of Funds from Financial Corporation, National



Flow of funds between a village in Chachoengsao and the other sectors in November, 2009



- $NFI = \text{Net Acquisition of Financial Assets (NAFA)} - \text{Net Incurrence of Liabilities (NIL)}$

$$\underbrace{NAFA - NIL}_{\text{(Financial) Surplus}} = \underbrace{GS - CF}_{\text{Gross Savings: Expenditures on Capital}}$$

(Financial) Surplus

Gross Savings:
Expenditures on Capital

Tools of Analysis: Modeling, Theory

- ❖ Micro data and price theory: Partial equilibrium
- ❖ Contract theory, mechanism design: To deal with obstacles to trade
- ❖ General equilibrium theory (putting in both of the above)
 - Preferences, endowments, technology
 - As measured in village, regions
 - Incorporate obstacles to trade, commodity space includes contracts and requires certain institutions
 - Are existing institutions good for implementation?
 - The good and the bad, guidance for policy
 - Welfare theorems: Equilibria Pareto optimal or not, policy guidance
 - Fire sales externalities
 - Need correct market structure
 - Guidance for payments, liquidity policy
 - Micro can aggregate up to macro, representative consumers, Gorman
 - Great benchmark
 - But this does not always work well in practice, especially with the obstacles, heterogeneity, non-linear aggregation and dynamics in wealth

Combination of Theory with Data: Specific, Focused Policy

❖ Risk sharing

- Consumption and income data
- Idiosyncratic shocks pooled, aggregate shocks remain
- Tests in Thai data with differences in risk aversion, null not rejected
- Policy: Presumption nothing there and so introduce index products, e.g., rainfall insurance
 - Theory and data tell us: This can make the more risk tolerant worse off as they were taking on more of the aggregate risk

❖ Risk premia and financial access

- With ROA: profits/asset data
- Idiosyncratic shocks dominate aggregate shocks in quantities
- In risk premia, it's reversed, aggregate shocks dominate, not insured
- Policy: Presumption poor are constrained with high marginal rates of return but do not have access to credit
 - Theory and data tell us: Adjusting for risk, it is different constraint, low return and cannot easily switch occupation

❖ How/Why

- The Mechanism: gifts and loans, informal markets
 - Very lively village money market
- Be leery of stereotypical policy, getting rid of money lenders
 - Informal, family and networks, may complement formal

Combination of Theory with Data: Obstacles to Trade

- ❖ Data: Investment, capital, consumption, income
- ❖ Contract theory, obstacles to trade
 - Information problems: Incentive to be diligent, moral hazard
 - Commitment problems: Willful default, collateral constraints
- ❖ Distinguish in the data: Obstacles vary by rural/urban status
 - Rural is savings only, or at most with limited borrowing
 - Urban is moral hazard, potentially even more sophisticated mechanism design
- ❖ Same finding, reinforced in other models
 - Occupation choice, transition from wage earner to SME
 - Limited liability groups of an agricultural development bank
- ❖ Policy: A specific, focused approach, not shotgun
 - More complete contracts in rural areas
 - Information credit registries in urban areas

Micro-founded Macro Models

❖ These explicit micro underpinnings alone generate endogenous urbanization

➤ Flow of funds and labor migration from rural to urban

Table 3: Macro and Meso Aggregates in the Baseline Economy

	Aggregate Economy	MH sector (Urban)	LC sector (Rural)
(a) National and Sectoral Aggregates			
Income (% of FB)	0.777	1.370	0.523
Capital (% of FB)	0.823	1.876	0.398
Labor (% of FB)	0.916	1.654	0.600
TFP (% of FB)	0.880	0.785	1.040
Consumption (% of FB)	0.868	1.049	0.791
Wealth (% of FB)	0.823	1.451	0.554
(b) Intersectoral Capital and Labor Flows			
Labor Inflow (% of Workforce)		0.749	-0.858
Capital Inflow (% of Capital Stock)		0.227	-0.393

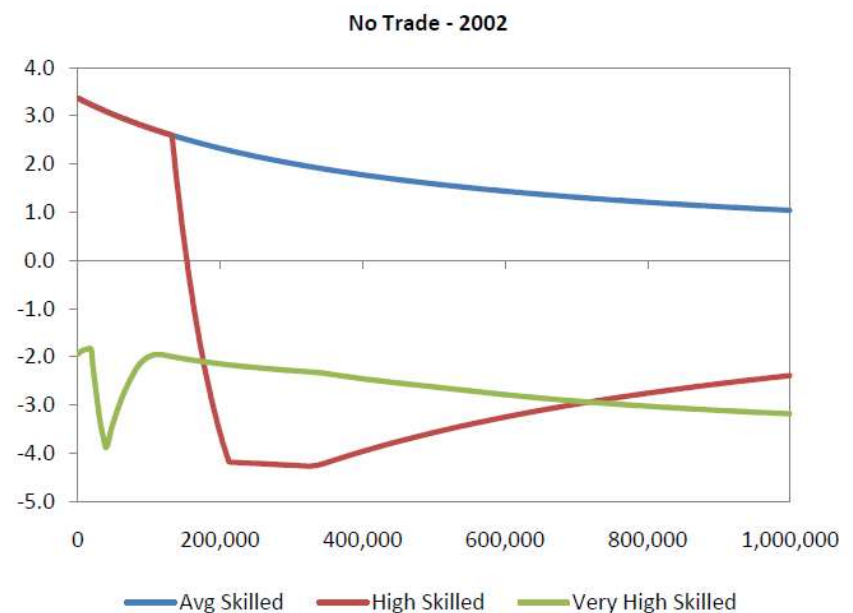
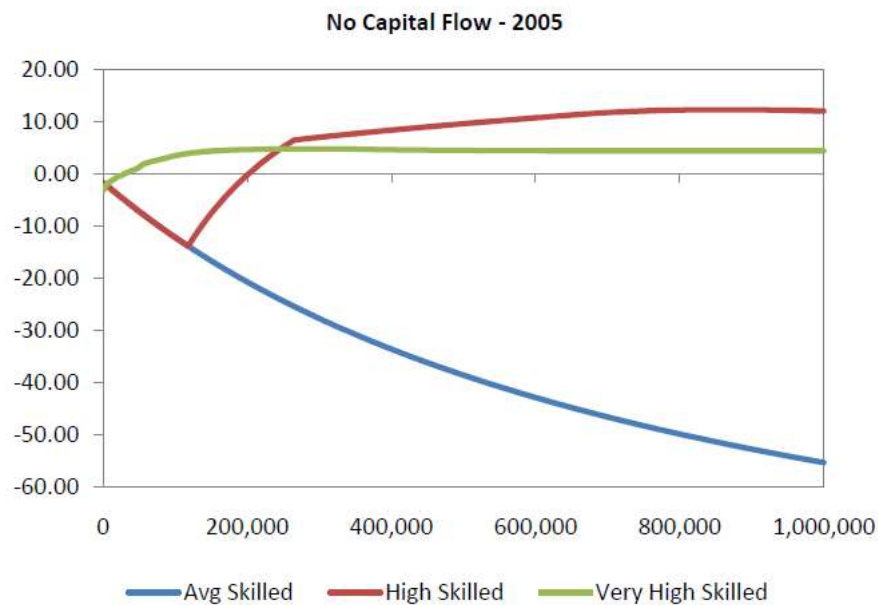
Source: Moll, Townsend & Zhorin, 2016

➤ Regional Isolationism-counterfactual evaluation

Counter-factual Policy Evaluation: Regional Isolation

- ❖ Winners/Losers: Heterogeneity in TFP, sectors (capital, labor)
- ❖ Hence wages and interest rates move with differential impact

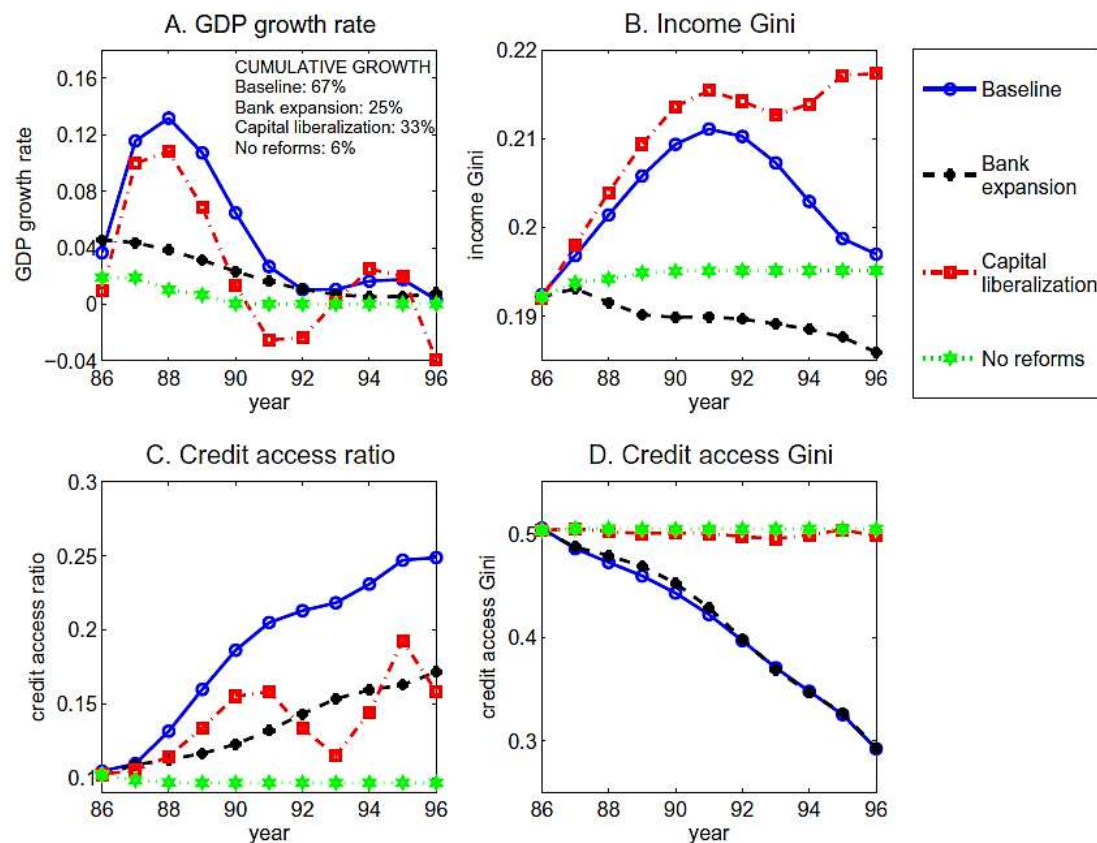
Comparison: Shutting Down Finance vs. Shutting Down Trade



Source: Paweenawat & Townsend (2016)

International Inflows vs. Domestic Branch Expansion

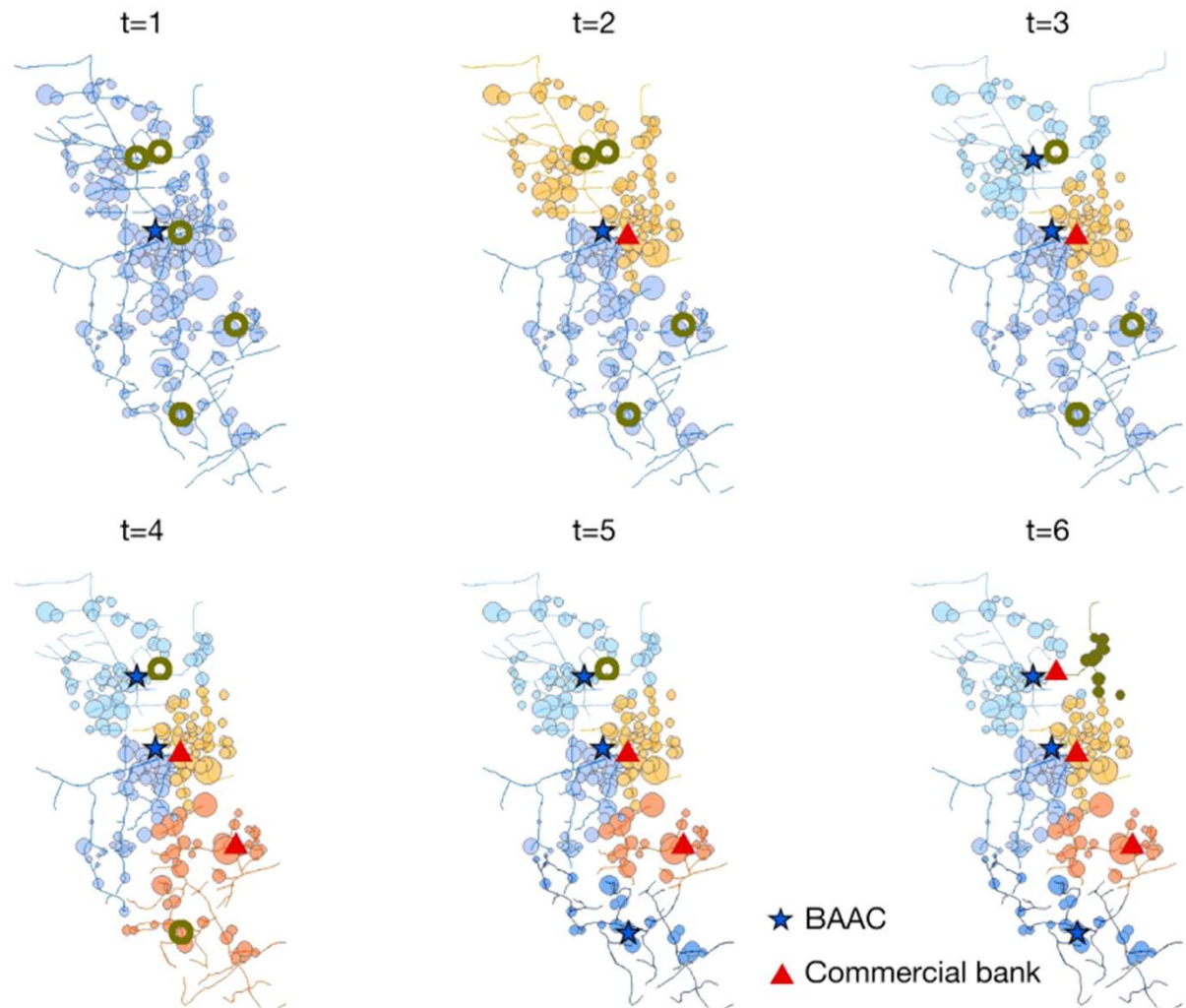
- ❖ 1,220 domestic markets
- ❖ Model: Credit to finance occupation choice and Baumol-Tobin savings



Source: Ji & Townsend (2016)

Development Bank Expansion: Actual Path vs. Alternative

- ❖ Dynamic sequential Nash equilibrium
- ❖ BAAC anticipates commercial bank entry, but this limits financial access
- ❖ If acts in own interest, or to achieve overall social optimum, different outcome

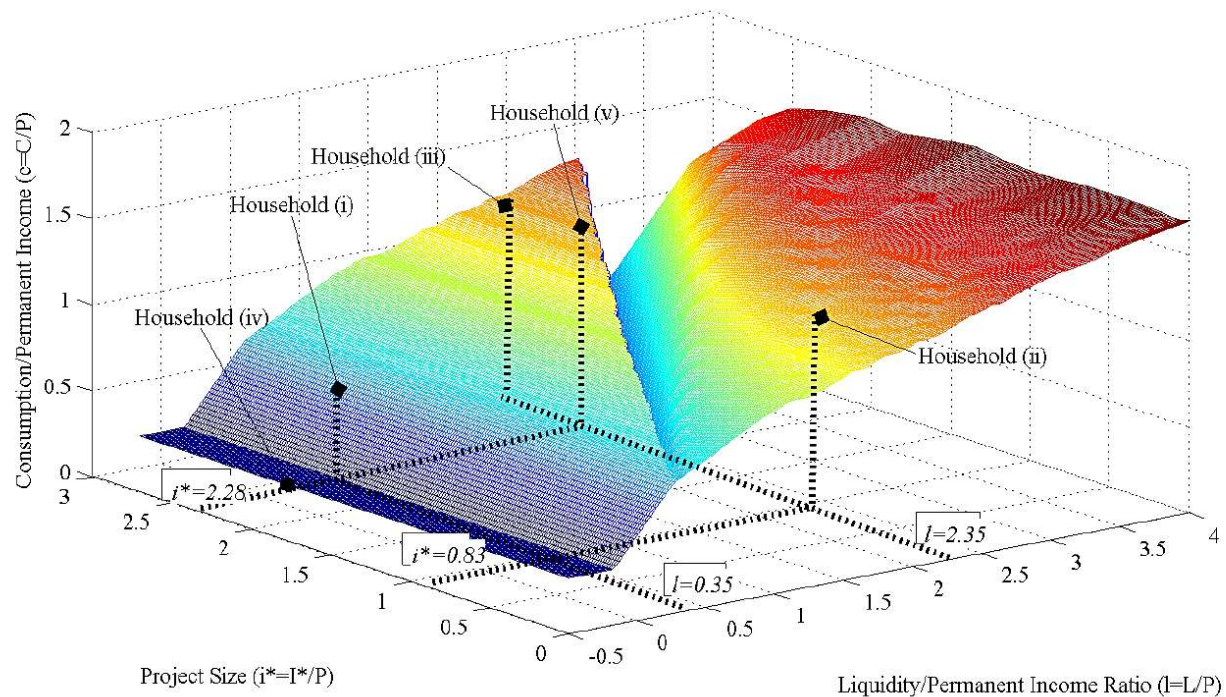


Specific Policy Interventions in Context: In Real Time

❖ Village Fund

- Credit limit and indivisible investment
- Estimate model using baseline, prior to intervention
- Savings and Loan in each village, million baht, hence inverse village population as instrument
- Heterogeneous treatment: Near default vs. hand to mouth vs. constrained in investment

Consumption policy as a function of liquidity and project size



Source: Kaboski & Townsend (2011)

Welfare Impact of Village Fund and Mechanism

- ❖ Welfare gains and alternative policy
 - Lump sum: Most would prefer, except for hand to mouth
 - Directed investment: Does not have the bad bankruptcy part
- ❖ Actual delivery mechanism: Two views
 - Corruption and the village committee
 - Productive households who got credit = good impact
- ❖ Role of informal money market
 - Borrow from informal to re-lend

Market Place Exchanges: Financial Innovation with New Technology

❖ Emerging markets

- Marketplace exchanges: financial access, informal becomes formal?
- P2P, B2B, B2P
- China as salient example: Alibaba, Credit Ease, off-line on-line
- But also elsewhere: Lending Club in U.S.

❖ Some issues, as in the U.S.

- Dodd-Frank and performance of money markets, OTC to centralized
- One regulated CCP for repo, economies of scale, externalities, Duffie
- Equity markets, let competition prevail, O'Hara
- Hybrid platforms in OTC markets – innovation is going on, anyway

❖ Optimal design: Recommendations to Thailand

- Starting from scratch, so far, little liberalization after financial crisis
- Use theory data algorithm

❖ Financial platforms

- Refers to market place exchanges (also bank, non-bank, broker-dealer, financial intermediary)

Optimal Design of Platforms: When Only One Is Optimal

- ❖ Financial intermediation and delegated monitoring
 - Environment: Large fixed costs of borrower project, need to pool investor funds, law of large numbers (iid shocks, no aggregate shocks)
 - Thus going through one institution to mitigate obstacles
- ❖ Credit registries and debt clauses
 - Environment: information problems for borrowers, multiple potential lenders
 - Collect information and centralize, then use this in debt clauses
- ❖ CCP
 - Environment: OTC, unobserved positions of traders
 - Collect information in operation of platform and create market rights to assign positions to others, removes the externality
- ❖ Financial innovation
 - Environment: Minimum scale in project/sectors, a non-convexity
 - Competition in franchise rights for one provider, prevent direct household firm contact
 - Not the usual regulation of markets
- ❖ Bank coalitions
 - Environment: Adverse selection, interim monitoring, realized returns
 - Coalition as a package incentive program for savers, borrowers, monitors
 - Open asset security market is bad

Multiple Platforms Coexisting: When Optimal

- ❖ Transactions costs in bilateral trade links
 - Environment: More links in a network mean more costs, benefits of diversification with iid returns
 - Can get finite sized clusters, market makers competing with each other for customer
- ❖ Two-sided markets (credit card redemption fees and unnecessary regulation)
 - Environment: Agents care about number and composition of who they are put in a market with, non-increasing returns in costs of setting up platforms
 - Characteristics of platform are priced, and different for different types, internalizes the externalities
- ❖ Rights to trade and a solution to fire sale externalities
 - Environment: Constraints in addition to budget constraints that contain prices
 - Example: Collateral constraints based on market valuation, incomplete markets with spot trade
 - Rights to trade at (any) pre-specified price: Pay or be paid to enter the market and trade
 - Fixing N.Y. money markets
 - Proposal at Federal Reserve Bank, New York for GCF repo

Hybrid Platforms Interlinked by Group, Shocks, or Time: When Optimal

❖ Joint liability groups

- Environment: members of group have more information or enforcement than outsiders: moral hazard, project choice, adverse types, renegeing
- Conditions under which joint liability acts as group with outsider

❖ Senioritization of claims

- Environment: verification and communication costs, as in delegated monitoring
- Extent of contagion depends on size of shocks, debt is not contingent if not reached

❖ Monitors: Rotation vs. long term relations

- Environment: Private information in initial states, interim states, and moral hazard
- Initially assigned monitors announce shocks and rotate, giving better information and better incentive
- Optimal bank supervision

ePayments: Financial Innovation

- ❖ **Developing Countries: e-money and financial access**
 - Electronic means bank accounts and hence possibly wider access
 - Key example, Kenya: M-Pesa
 - Rise of e-credit: How well is e-credit functioning, really?
 - Dealers run out of cash/credit: There is a money market, maybe like N.Y. markets
- ❖ **U.S. payments system: Excess reserves, benefits and some critical views**
 - Few trade failures as experienced in the past, not lacking for liquidity
 - Fewer daylight overdrafts
 - But do we want to keep expanded balance? Some see risks
- ❖ **Common policy issues across country types: Fast payments**
 - Payments in developing countries, as in Thailand, not much there now, but is the plumbing ready?
 - In the U.S.: Is Federal Reserve Bank open 24/7? And if not, private arrangements. Under discussion.

Optimal Design of Payments System: Potential Problems and a Role for Policy

- ❖ Liquidity is not enough, record keeping and the coordination problem
 - Need one of: Perfect costless enforced credit, or big central warehouse trading with everyone, or more record keeping
 - Distributed ledgers as a potential solution to the latter: As in Bitcoin, Ripple, but also bank systems
 - Privacy and other, mechanism design issues as in dark pools
- ❖ Provision of liquidity: Private?
 - Centralized: Novation and CCP
 - A substitute for central bank liquidity, CCP takes over interim positions
 - Problems with intra-day credit, backed by Federal Reserve and warnings
 - Decentralized: Circulating private debt as the medium of exchange
 - High velocity private liabilities can work, as in the past, bills of exchange
 - Potential with problems in coordination in issuance, and crisis in money market
- ❖ Rate of return on public liquidity
 - Friedman-type rules and more activist liquidity policy
 - Depends on trade obstacles, search frictions
 - Depends on institutions and IO structure filtering
 - Based on implicit marginal rates of substitution among agents
 - More generally, target ex ante overall optimum, not simply observed rates in money market

Summary and Conclusions

❖ Data

- Assess and organize existing sources, GIS archive
- Add household/firm surveys with panel

❖ Theory/modeling tools

- Micro-founded macro models, add these to tool kit, more than the first-wave DSGE

❖ Example of theory/data combination in practice

- With specific, focused policy recommendations
- Artillery/models already there to use

❖ Evaluation of actual policies and counter-factual policies using these frameworks

- Incorporate into policymaking and decisions going forward

❖ Marketplace financial exchanges and policy recommendations

- Not whether to do, but how

❖ Payments and liquidity policy

- Thinking this through as innovations inevitably move us