How do individuals respond to tax subsidy for long-term savings? Evidence from Thailand's tax return data

SEC Capital Market Symposium 2019
Encouraging long-term investment and retirement savings is a top agenda for rapidly aging Thailand.

Around 63% of taxpayers use at least one deduction for savings in 2018.

Share of taxpayers with tax incentives for savings

<table>
<thead>
<tr>
<th>Year</th>
<th>2007</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>52</td>
<td>63</td>
<td></td>
</tr>
</tbody>
</table>

.. with the saving rate of slightly over 10%.

Deduction for savings in percent of income among those who have deduction

<table>
<thead>
<tr>
<th>Year</th>
<th>2007</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.7</td>
<td>10.2</td>
<td></td>
</tr>
</tbody>
</table>

Overall uses of the tax incentives for savings are rising over the past decade.

Source: Muthitacharoen and Burong (2019)
But saving rates are significantly smaller for low and middle-income taxpayers

Deduction for saving in percent of income by income groups, 2018 (for only those with deductions)

The saving rates for Q1-Q4 are considerably lower

Note: The income quintiles/percentiles are based on income net of expense
Source: Muthitacharoen and Burong (2019)
Share of taxpayers with retirement/long-term savings is also small

Decomposition of taxpayers by saving types and income quintiles (2018)

Note: The income quintiles are based on income net of expense
Source: Muthitacharoen and Burong (2019)
How do individuals respond to tax deduction for long-term savings/investment?

- To a large extent, no clear answer in the Thai context
- Improving policy design requires understanding:

  Which segments of taxpayers are more or less responsive to such subsidies and why they respond

Research Design

Quasi experiment
- The 2013 personal income tax schedule change

Methodology
- Difference in Difference

Data
- Panel of de-identified tax filers: 8 million tax records
Contribution to literature

- Literature on how individuals respond to tax subsidy for retirement and long-term savings typically focuses on developed countries
  - Gelber (2011)
  - Chetty et al. (2014)
  - Kreiner, Leth-Petersen an Skov (2017)

- But findings from advanced economies are unlikely to directly apply to developing countries
  - Institutional environment (e.g. public welfare and social security provision) also matters

- Our findings generate broad implications for policymakers in middle-income countries
1. Research design

2. Finding 1: Income Heterogeneity

3. Finding 2: Role of Active vs. Passive Choice
Thai government provides several tax deductions for retirement and long-term savings

Average deduction in % of income conditional on having each deduction (2018)

Source: Muthitacharoen and Burong (2019)
Portfolio composition of tax deduction for long-term investment by type and age, 2018

Source: Muthitacharoen and Burong (2019)
We identify the response using a quasi-experiment provided by the 2013 tax schedule change.

<table>
<thead>
<tr>
<th>Annual net income</th>
<th>2009-2012</th>
<th>2013-2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-150,000</td>
<td>Exempt (0%)</td>
<td>Exempt (0%)</td>
</tr>
<tr>
<td>150,001-300,000</td>
<td>10%</td>
<td>5%</td>
</tr>
<tr>
<td>300,001-500,000</td>
<td>10%</td>
<td>10%</td>
</tr>
<tr>
<td>500,001-750,000</td>
<td>20%</td>
<td>15%</td>
</tr>
<tr>
<td>750,001-1,000,000</td>
<td>20%</td>
<td>20%</td>
</tr>
<tr>
<td>1,000,001-2,000,000</td>
<td>30%</td>
<td>25%</td>
</tr>
<tr>
<td>2,000,001-4,000,000</td>
<td>30%</td>
<td>30%</td>
</tr>
<tr>
<td>Above 4,000,000</td>
<td>37%</td>
<td>35%</td>
</tr>
</tbody>
</table>

Notes: 1) The 40th percentile of adjusted taxable income in 2013 = 500,000, 2) The 65th percentile of adjusted taxable income in 2013 = 750,000, and 3) The 90th percentile of adjusted taxable income in 2013 = 1,000,000.
Illustration of the construction of treatment and control

<table>
<thead>
<tr>
<th>Annual income range</th>
<th>Tax subsidy Before 2013</th>
<th>Tax subsidy 2013 and after</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control 750,000-862,500</td>
<td>20%</td>
<td>20%</td>
</tr>
<tr>
<td>Treatment 637,500-750,000</td>
<td>20%</td>
<td>15%</td>
</tr>
</tbody>
</table>

Middle-income taxpayers: 15% around 750,000
How we measure the impact of the 2013 tax change on long-term savings

We investigate how individual’s savings respond to the tax subsidy change across the entire income distribution.
Baseline difference-in-difference estimation equation

\[ Sav_{i,t} = \beta_0 + \beta_1 Treat_{i,t} + \beta_2 Post_{i,t} + \beta_3 Treat_{i,t} \times Post_{i,t} + \beta_4 Y_{i,t} + \beta_5 Treat_{i,t} \times Y_{i,t} + \beta_6 Post_{i,t} \times Y_{i,t} + \beta_7 Treat_{i,t} \times Post_{i,t} \times Y_{i,t} + \beta_8 X_{i,t} + \text{yearFE} + \text{coffFE} + \text{yearFE} \times \text{coffFE} + \varepsilon_{it} \]

where \( Sav_{i,t} = \) LTF contribution,

\( Treat_{i,t} = 1 \) for treatment group (0 for control group),

\( Post_{i,t} = 1 \) for years 2013-2016 (0 for 2009-2012),

\( Y_{i,t} = \) adjusted taxable income, \( X_{i,t} = \) a vector of control variables, and \( \varepsilon_{it} = \) error term.

\( \beta_7 \) represents the causal effect of the reduction in the tax subsidy on the MPS
Data

De-identified panel of personal income tax return data for the population of Thai tax filers from 2009-2016

Focus on

- Tax filers with salaried income only
- Age 20-60
- Baseline sample: 8.1 million tax records

To avoid potential endogeneity, we define:

**Adjusted taxable income** = Gross income net of expense and deductions related to personal characteristics (e.g. children and elderly parents)
Outline

1. Related design

2. Finding 1: Income Heterogeneity

3. Finding 2: Role of Active vs. Passive Choice
Visualizing difference in MPS between treatment and control before and after the tax change

\[ Sav_{i,t} = \beta_0 + \beta_1 \text{Treat}_{i,t} + \beta_2 Y_{i,t} + \beta_3 \text{Treat}_{i,t} \times Y_{i,t} + \text{coffFE} + \varepsilon_{it} \]

Difference in MPS for LTF for individuals below and above the tax cutoff (Low-income group)

Note: Shaded band indicates 95% confidence interval

Source: Muthitacharoen and Burong (2019)
Middle-income taxpayers respond strongly to the price subsidy reduction

MPS in LTF = 0.05

If a middle-income taxpayer earns 1,000 baht, she will contribute 50 baht to LTF.

The 2013 tax schedule change lowers the MPS in LTF by 23%

Note: Middle-income taxpayers are those with adjusted monthly income approximately: 50,000-70,000 baht. Shaded bar indicates 95% confidence interval.
Source: Muthitacharoen and Burong (2019)
High-income group: significant impact but its magnitude is much smaller than middle-income counterparts

Difference in MPS for LTF for individuals below and above the tax cutoff (High-income group)

Marginal propensity to save in LTF

Note: Shaded band indicates 95% confidence interval
Source: Muthitacharoen and Burong (2019)
The saving responses of middle-income taxpayers are much higher than those of high-income group

**Effect of the cut in the after-tax price by 1% on the MPS in LTF**

Price elasticity of MPS (% change in MPS)

A 1% reduction in the after-tax price of LTF will increase MPS of middle-income taxpayers by 3.6%

A 1% reduction in the after-tax price of LTF will increase MPS of high-income taxpayers by only 0.8%

Note: Middle-income taxpayers are those with adjusted monthly income approximately: 50,000-70,000 baht. High-income taxpayers are those with adjusted monthly income: 70,000-380,000 baht.

Source: Muthitacharoen and Burong (2019)
Robustness tests performed

- **Placebo income cutoff**: Above and below 875,000 baht
  - No significant effect on the MPS

- **Individual fixed effect**: Controlling for unobserved time-invariant factors across individuals
  - Consistent with baseline findings

- **Narrower income cutoff**: 10% instead of 15% around the cutoff
  - Consistent with baseline findings
Outline

1. Related design

2. Finding 1: Income Heterogeneity

3. Finding 2: Role of Active vs. Passive Choice
Investigating the mechanisms underlying the strong responses of middle-income taxpayers

Examining how individuals make their LTF contributions

**Active**
- Individuals who adjusted positive LTF contribution amounts at least once during the pre-tax-cut period

**Passive**
- Individuals who did not adjust their LTF contribution during the pre-tax-cut period

Effect of the cut in the after-tax price by 1% on the MPS in LTF

<table>
<thead>
<tr>
<th>Price elasticity of MPS (% change in MPS)</th>
</tr>
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<tbody>
<tr>
<td>Passive</td>
</tr>
<tr>
<td>5.0</td>
</tr>
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</table>

Individuals who actively adjust their LTF contributions are considerably more responsive to the subsidy change

Source: Muthitacharoen and Burong (2019)
Focusing on individuals with tax-deductible long-term savings

Examining main saving instruments for taxpayers

- **Active**
  - LTF/RMF
  - Requiring active decision

- **Passive**
  - Provident funds
  - Automatic contributions

Individuals who mainly rely on automatic contributions are not responsive at all to the tax incentive change

Effect of the cut in the after-tax price by 1% on the MPS in LTF

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<tbody>
<tr>
<td>Passive</td>
</tr>
<tr>
<td>0.0</td>
</tr>
</tbody>
</table>

Source: Muthitacharoen and Burong (2019)
Identifying active and passive savers/investors

Distribution of taxpayers with tax-deductible long-run savings by their main saving types (2009 and 2018)

Source: Muthitacharoen and Burong (2019)
Active savers/investors tend to be older

Distribution of taxpayers with tax-deductible long-run savings by their main saving types and age groups (2018)

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Passive (Provident funds)</th>
<th>Active (LTF/RMF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>20-25</td>
<td>80%</td>
<td>20%</td>
</tr>
<tr>
<td>25-30</td>
<td>77%</td>
<td>23%</td>
</tr>
<tr>
<td>30-35</td>
<td>75%</td>
<td>25%</td>
</tr>
<tr>
<td>35-40</td>
<td>72%</td>
<td>28%</td>
</tr>
<tr>
<td>40-45</td>
<td>67%</td>
<td>33%</td>
</tr>
<tr>
<td>45-50</td>
<td>64%</td>
<td>36%</td>
</tr>
<tr>
<td>50-55</td>
<td>58%</td>
<td>42%</td>
</tr>
<tr>
<td>55-60</td>
<td>48%</td>
<td>52%</td>
</tr>
</tbody>
</table>

Source: Muthitacharoen and Burong (2019)

Individuals invest more in LTF/RMF as they approach retirement
Middle-income taxpayers tend to rely more on automatic contributions

Distribution of taxpayers with tax-deductible long-run savings by their main saving types and income quintiles (2018)

Note: The income quintiles are based on income net of expense
Source: Muthitacharoen and Burong (2019)
Active savers tend to save more across the income distribution

Mean tax-deductible long-run savings in % of income by income quintiles for passive and active savers/investors (2018)

<table>
<thead>
<tr>
<th>Income Quintile</th>
<th>Passive</th>
<th>Active</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1</td>
<td>3.0</td>
<td>5.5</td>
</tr>
<tr>
<td>Q2</td>
<td>3.7</td>
<td>7.8</td>
</tr>
<tr>
<td>Q3</td>
<td>4.2</td>
<td>10.0</td>
</tr>
<tr>
<td>Q4</td>
<td>5.1</td>
<td>12.3</td>
</tr>
<tr>
<td>Q5</td>
<td>6.7</td>
<td>17.1</td>
</tr>
<tr>
<td>All</td>
<td>4.7</td>
<td>15.3</td>
</tr>
</tbody>
</table>

Note: The income quintiles are based on income net of expense
Source: Muthitacharoen and Burong (2019)
Key Takeaways

1. Tax incentives can be an important tool to encourage long-term savings

2. But responses vary significantly between middle- and high-income taxpayers

3. Increasing investment literacy among middle-income taxpayers remains an important priority
End of Document