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# Digital Fiscal Stimulus and SMEs: Insights from Thailand's Half and Half Program

## Abstract

This study investigates the impact of Thailand's 'Half and Half' program on SMEs. Designed to boost spending on small food vendors, the program distributes subsidies via a digital platform, granting consumers a fixed-percentage copay on every eligible purchase. I employ a difference-in-difference approach using weekly province-level data from LINE MAN Wongnai. I find that the program significantly elevates sales among participating vendors relative to non-participants. Regarding the underlying mechanism, the findings indicate that the increase in sales is primarily driven by an expansion in the unique customer base, rather than an increase in individual order sizes. Crucially, these positive effects persist even after the program's conclusion, with smaller vendors experiencing more pronounced sustained benefits. This investigation enriches the emerging literature on digital fiscal stimulus, underlining their potential for both immediate and sustained economic impact. The findings bear crucial implications for policymakers navigating fiscal strategies in an increasingly digital economic landscape.

JEL-Codes: D220, H320, O310.

Keywords: fiscal stimulus, digital platform, SME.

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## 1. Introduction

SMEs are vital for employment and growth but were particularly vulnerable during the economic crisis. In response to the Covid-19 crisis, countries like China and Thailand have rolled out digital stimulus programs, specifically targeting these entities. Although extensive research exists on broad SME support (OECD, 2022), targeted digital fiscal interventions remain underexplored. This represents an important literature gap, especially in the context of an increasingly digital economy.

This study investigates Thailand's 'Half and Half' program, a digital stimulus aimed at enhancing spending in small food vendors. Using a difference-in-difference approach with program participation as identification, I examine its impact on SME sales, highlighting primary drivers and potential sustaining effects. I utilize weekly province-level data from LINE MAN Wongnai, a major delivery platform in Thailand.

The key threat to my empirical design is that participants and nonparticipant businesses may not be comparable. I address this concern by conducting an event study estimation around the launch of the program. The analysis indicates no significant pre-trend coefficient. I also include province- and time-fixed effects to account for any changes in economic conditions that could influence business sales. These measures strengthen the validity of my identification strategy and suggest that any potential bias due to endogenous selection is likely minimal.

This paper is closely related to the literature on fiscal stimulus programs targeting specific economic sectors. While much existing research, such as Mian and Sufi (2012) for the US and Muthitacharoen et al. (2019) for Thailand, has focused on the automotive sector, recent studies like those by Liu et al. (2021), and Xing et al. (2023) have started to investigate Chinese local government's digital stimulus targeting specific types of businesses. Those studies predominantly focus on consumer or debt responses. While

these prior studies generally focus on consumer or debt response, my research augments the literature by examining the immediate and sustained impacts of a digital stimulus program on small businesses.

## 2. The Half and Half program, data and method

Following the Covid-19 pandemic, the Thai government introduced the 'Half and Half' program, which distributes subsidies through a digital platform. It offers a 50% subsidy, capped at 150 baht daily. Participation is limited to non-corporate entities, thereby excluding larger corporate businesses. Consumers register on a first-come basis, with no income criteria.

My study primarily focuses on October-December 2021, a critical period during which the program was introduced on digital delivery platforms. Each registered consumer receives the maximum allowance of 4,500 baht during this period. The subsequent phase, from February to April 2022, which forms part of our extended analysis, saw a reduced subsidy allocation of 1,200 baht per individual.

I utilize data from LINE MAN Wongnai, which represents over 70% of participating food vendors. Using the difference-in-difference approach. vendors are classified into treatment (program participations) and control groups (nonparticipants). To ensure a fair comparison, I restrict the sample to small vendors, specifically those with weekly sales not exceeding 5,000 baht (USD 143).[1] A primary concern is the non-random nature of program participation—vendors who opt in may be systematically different from those who do not. To address this issue, an event study analysis is conducted in the

[1] The conversion is based on the exchange rate in August 2023 (around 35 baht/USD).

subsequent section, assessing pre-existing trends around the program's launch to evaluate their impact on the observed effects.

The base analysis spans from August-December 2021. I construct weekly province-level outcome variables: sales, number of orders, number of unique customers and order size. Each variable is an average for its respective province during the week under consideration. I compare outcomes prior to and after the program's launch on delivery platforms at the start of October 2021. Businesses are required to be on the platform during the pre-program period. The attrition rates are around 3%, indicating a stable sample across the studied period.

The base estimation equation is:

$$y_{i,t} = \beta_0 + \beta_1 Treat_i + \beta_2 Post_t + \beta_3 Treat_i * Post_t + ProvinceFE + TimeFE + \varepsilon_{it}, \quad (1)$$

where $y_{i,t}$ = an outcome variable, $Treat_i$ = 1 for program participants (0 otherwise), $Post_t$ = 1 for the program period for delivery platform (0 otherwise), $\varepsilon_{it}$, = an error term. I also include province-, and year-fixed effects. Standard errors are heteroscedasticity robust.

Another pivotal question concerns the program's potential for sustained impact on businesses after its conclusion. I extend the analysis to encompass the data up to August 2022, capturing two distinct program phases: October-December 2021 (Post) and February-April 2022 (Post2). The period following the program's conclusion (May-August 2022) is labeled as Post3. I omit January 2022 data to avoid potential payment recording lags during the program's inactive period. I estimate the following equation:

$$y_{i,t} = \beta_0 + \beta_1 Treat_{i,t} + \beta_2 Post_{i,t} + \beta_3 Post2_{i,t} + \beta_4 Post3_{i,t} + \beta_5 Treat_{i,t} * Post_{i,t} + \beta_6 Treat_{i,t} * Post2_{i,t} + \beta_7 Treat_{i,t} * Post3_{i,t} + provinceFE + yearFE + \varepsilon_{it}, \quad (2)$$

where $Post2_{i,t}$ = 1 for the period during February-April 2022 (0 otherwise), $Post3_{i,t}$ = 1 for the period during May-August 2022 (0 otherwise), and all of the other variables are as described for equation (1).

Table 1 provides the summary statistics. The average weekly sale is around 1,250 baht, while an average order size is 109 baht. Additionally, on average, vendors cater to 9.8 unique customers and receive 11.7 orders.

**Table 1: Summary statistics of variables used in the base analysis of small business response**

| Variables | N | Mean | Median | SD |
|---|---|---|---|---|
| Sales | 3,302 | 1,249.6 | 856.3 | 906.7 |
| Number of orders | 3,302 | 11.731 | 7.959 | 8.711 |
| Number of unique customers | 3,302 | 9.843 | 6.586 | 7.532 |
| Order size | 3,302 | 109.219 | 103.485 | 27.437 |
| Treat | 3,302 | 0.502 | 1.000 | 0.500 |
| Post | 3,302 | 0.591 | 1.000 | 0.492 |

## 3. Empirical results

I begin with the sales trajectory of these small food vendors before and after the program's platform introduction in October 2021 (Figure 1). Prior to this, sales trends for both groups are roughly parallel. Post-platform program introduction, however, there is a marked increase in the treatment group's sales. This evident surge suggests the potentially pronounced effect of the program.

**Figure 1: Sales for treatment and control groups before and after the program (weekly sales per vendor)**

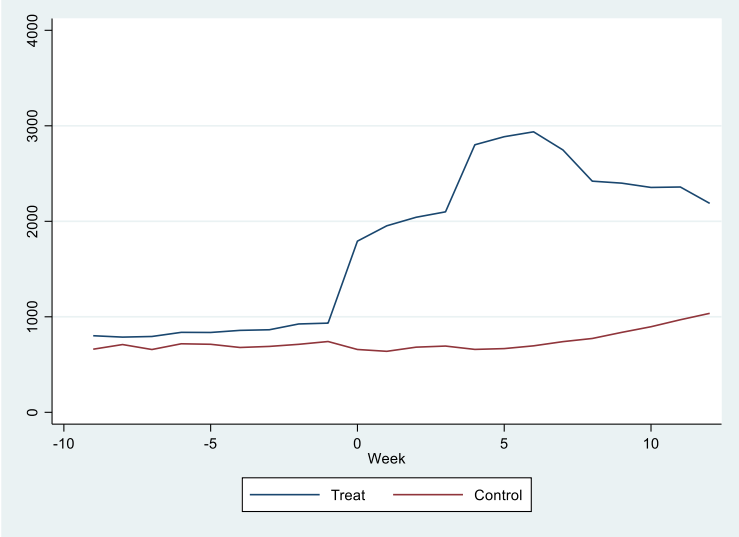
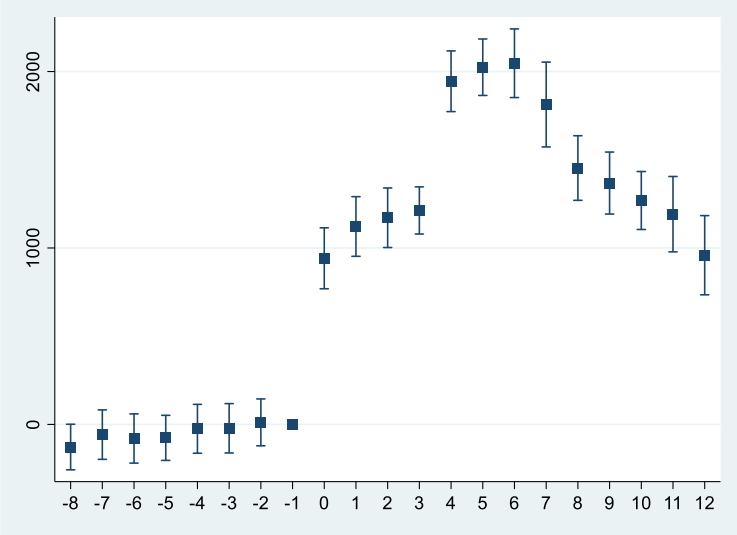



Figure 2 illustrates the event-study estimate around the program introduction. Notably, all pre-trend coefficients are insignificant. This supports the identification strategy and suggests that any bias resulting from potential endogenous selection is likely to be minimal.

**Figure 2 Event-study estimates of the effects of the program**




Note: Week 0 marks the introduction of the Half and Half program, and the immediate week preceding the policy introduction (-1) is omitted, serving as the base year for comparisons.

Table 2 presents the estimate of Equation 1. After the program introduction, the treatment group's sales increase by 1,473.5 baht relative to the control group—a significant 174% increase from the treated pre-program average (Columns 1).[2] I further examine the program's underlying mechanism and find that its primary driver is broadening vendor's customer bases, rather than enlarging individual orders (Columns 2-4). Following the program introduction, treated businesses see a rise in order count and unique customers by 13.9 (167% of the treated pre-program mean) and 12.1 (176% of the same mean) respectively, relative to the control group. Order sizes, meanwhile, remain consistent.

[2] The results are consistent under alternative assumptions including the inclusion of fixed effects and the use of log of dependent variable. These robustness tests are available in the supplementary appendix.

## Table 2: Estimate of the impact of the Half and Half program

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total sales | Number of orders | Number of unique customers | Order size | **Size heterogeneity** (Dep. var = Total sales) | | | **Extended period** (Dep. var = Total sales) | | | |
| | | | | | Tier 1 | Tier 2 | Tier 3 | Overall | Tier 1 | Tier 2 | Tier 3 |
| Treat | 145.7*** | 1.823*** | 1.535*** | -6.673*** | 36.7*** | -10.0 | -37.6 | 148.1*** | 34.4 | -32.8 | -45.7 |
| | (16.2) | (0.156) | (0.132) | (1.024) | (14.2) | (19.8) | (33.7) | (20.7) | (21.1) | (27.9) | (38.6) |
| Post | 140.8** | -0.373 | 0.005 | 11.436*** | 355.4*** | 170.7*** | 91.8 | 146.2** | 354.8*** | 152.6*** | 82.4 |
| | (60.0) | (0.561) | (0.468) | (2.075) | (57.4) | (54.2) | (114.2) | (61.1) | (61.2) | (58.8) | (117.6) |
| Treat-x-Post | 1,473.5*** | 13.874*** | 12.051*** | -0.828 | 1,025.1*** | 1,316.1*** | 1,929.2*** | 1,471.1*** | 1,021.3*** | 1,322.6*** | 1,937.0*** |
| | (29.0) | (0.284) | (0.243) | (1.474) | (28.7) | (35.5) | (66.9) | (32.0) | (33.3) | (40.8) | (71.6) |
| Post2 | | | | | | | | 411.8*** | 588.0*** | 385.7*** | 502.0*** |
| | | | | | | | | (54.0) | (56.0) | (64.4) | (140.1) |
| Treat-x-Post2 | | | | | | | | 882.6*** | 715.8*** | 867.6*** | 861.8*** |
| | | | | | | | | (34.9) | (37.2) | (45.2) | (71.9) |
| Post3 | | | | | | | | 865.1*** | 965.8*** | 822.6*** | 1,021.9*** |
| | | | | | | | | (51.7) | (54.7) | (78.7) | (112.9) |
| Treat-x-Post3 | | | | | | | | 120.3*** | 156.4*** | 238.2*** | -23.6 |
| | | | | | | | | (26.1) | (28.6) | (36.4) | (55.9) |
| Observations | 3,302 | 3,302 | 3,302 | 3,302 | 3,132 | 3,101 | 3,261 | 7,622 | 7,300 | 7,110 | 7,529 |
| R-squared | 0.758 | 0.748 | 0.751 | 0.386 | 0.647 | 0.687 | 0.532 | 0.668 | 0.591 | 0.645 | 0.480 |
| Mean of dep. var for treated pre-program | 849.0 | 8.298 | 6.8 | 103.8 | 251.7 | 469.9 | 1,121.1 | 849.0 | 251.7 | 469.9 | 1,121.1 |
| Effect in % of treated pre-program | 173.6% | 167.2% | 176.3% | -0.8% | 407.4% | 280.1% | 172.1% | 1) 173.3%<br>2) 104.0%<br>3) 14.2% | 1) 405.8%<br>2) 284.4%<br>3) 62.1% | 1) 281.5%<br>2) 184.7%<br>3) 50.7% | 1) 172.8%<br>2) 76.9%<br>3) -2.1% |

Note: ***, **, * denotes significance at the 1%, 5%, and 10% levels, respectively. All models include province- and year-FE. The effects in % of treated pre-program for the extended-period analysis are for Treat-x-Post1, Treat-x-Post2, and Treat-x-Post3, respectively.

To explore how the effects vary with size, I categorize vendors based on pre-program average weekly sales into three tiers: Tier 1 (<= 500 baht), Tier 2 (500-1,000 baht), and Tier 3 (1,000-5,000 baht). I find that the program yields larger effects for smaller businesses (Columns 5-7). Post-program, Tier 1 vendors see an increase in sales of 1,025 baht relative to the control group (407% of the treated pre-program mean). For Tier 2 and Tier 3 vendors, the increases are 1,316 baht (280%) and 1,929 baht (172%), respectively.

I also find that the program has left significant lasting impacts on participating vendors. After the program conclusion, the treated group experiences a sales increase of 120.3 baht, 14% of their pre-program mean, compared to the control group (Column 8). Interestingly, the program's sustained benefits are more pronounced for smaller vendors (Columns 9-11). Post-program conclusion, Tier 1 vendors experience an increase of 156.4 baht (62% of the treated pre-program mean). Tier 2 vendors also see significant, although smaller, benefits at 51% of their pre-program means. The effects for Tier 3 vendors, however, are not statistically significant. A potential explanation is that the program gives smaller vendors, who previously had a limited clientele, access to a broader audience. Such heightened market access has a more transformative effect on smaller vendors as compared to their larger counterparts. This aligns with our supplementary evidence that increases in unique customer counts are more pronounced for smaller vendors.[3]

[3] This result is available in the supplementary appendix.

## 4. Conclusion

This study examines the impact of Thailand's 'Half and Half' program on SMEs. It finds that the program significantly increased sales among participating vendors, primarily by broadening their unique customer base. Importantly, these benefits persist beyond the program's conclusion, with smaller vendors experiencing larger sustained benefits. Finally, I emphasize that this study concentrates on digital platform interactions, overlooking broader business activities like employment and investment. Those issues are left as a future research avenue.

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## Supplementary Appendix

### Table A1: Robustness tests of the baseline estimate

| | (1) Total sales | (2) Total sales | (3) Total sales | (4) Log(Total sales) |
|---|---|---|---|---|
| Treat | 151.054*** | 151.039*** | 146.004*** | 0.166*** |
| | (14.213) | (14.122) | (16.280) | (0.019) |
| Post | 66.433*** | 144.878** | 60.639*** | 0.236*** |
| | (11.134) | (64.127) | (13.668) | (0.046) |
| Treat-x-Post | 1,467.950*** | 1,468.395*** | 1,473.584*** | 0.968*** |
| | (32.441) | (31.377) | (30.299) | (0.023) |
| Observations | 3,302 | 3,302 | 3,302 | 3,302 |
| R-squared | 0.665 | 0.690 | 0.732 | 0.765 |
| Province FE | No | No | Yes | Yes |
| Time FE | No | Yes | No | Yes |

Notes: This table presents various robustness tests. Column 1 omits all fixed effects, while Column 2 incorporates time fixed effects, and Column 3 includes only province fixed effects. In Column 4, the log of total sales serves as the dependent variable. Standard errors are heteroscedasticity robust. ***, **, * denotes significance at the 1%, 5%, and 10% levels, respectively.
Source: Author's analysis based on data from LINE MAN Wongnai.

**Table A2: Estimates of the impact of the Half and Half program on number of unique customers: Overall and by size (Dependent variable: number of unique customers)**

| | (1)<br>Tier 1 | (2)<br>Tier 2 | (3)<br>Tier 3 |
|---|---|---|---|
| Treat | 0.421*** | 0.216 | 0.387 |
| | (0.106) | (0.164) | (0.250) |
| Post | 1.953*** | 0.705 | -0.585 |
| | (0.407) | (0.432) | (0.853) |
| Treat-x-Post | 8.596*** | 10.752*** | 15.472*** |
| | (0.211) | (0.283) | (0.512) |
| Observations | 3,132 | 3,101 | 3,261 |
| R-squared | 0.695 | 0.696 | 0.547 |
| Province FE | YES | YES | YES |
| Time FE | Yes | Yes | Yes |
| Mean of dep. var for treated pre-program | 2.046 | 3.913 | 8.970 |

Notes: This table shows the estimate of equation (1) with the number of unique customers as a dependent variable. The segmentation is based on pre-policy average sales: Tier 1 (weekly sales <= 500 baht), Tier 2 (500 baht < weekly sales <= 1,000 baht), and Tier 3 (1,000 baht < weekly sales <= 5,000 baht). Standard errors are heteroscedasticity robust. ***, **, * denotes significance at the 1%, 5%, and 10% levels, respectively.
Source: Author's analysis based on data from LINE MAN Wongnai.