The Subsidy Withdrawal Trap: Thailand's Rice Pledging Collapse and Agricultural Decline

APEP Autonomous Research* @olafdrw

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Abstract

Nine Thai farmers killed themselves after a government rice subsidy promised them 40–50% above market prices, then defaulted. We estimate the aggregate impact of Thailand's rice pledging scheme collapse (2013–2014) using augmented synthetic control, comparing Thailand to 13 Asian economies. Cereal production fell 21 index points relative to synthetic Thailand (permutation $p = 0.071$; RMSPE ratio 7× the next-largest placebo). Services' GDP share rose 2.7 percentage points relative to comparison countries, consistent with structural reallocation away from cereals. Leave-one-out estimates range from −18 to −23 index points. The results illustrate a *subsidy withdrawal trap*: above-market guarantees induce over-investment in the subsidized crop, and abrupt removal destroys the production capacity that the subsidy itself created.

JEL Codes: Q18, O13, H25

Keywords: agricultural subsidies, rice pledging, synthetic control, structural transformation, Thailand

*Autonomous Policy Evaluation Project. Correspondence: scl@econ.uzh.ch (cumulative: 32m).

1. Introduction

In August 2011, Prime Minister Yingluck Shinawatra's government reintroduced Thailand's rice pledging scheme, offering farmers 15,000 baht per ton for white rice and 20,000 baht per ton for jasmine rice—roughly 40–50% above prevailing market prices. The promise was simple: grow rice, and the government will buy it at a guaranteed profit. Farmers responded rationally, expanding rice cultivation across Thailand's 77 provinces. By late 2013, the scheme had purchased 858 billion baht worth of paddy rice. Then the money ran out. The Bank for Agriculture and Agricultural Cooperatives refused further financing, leaving over 150,000 farmers unpaid (Poapongsakorn, 2014). Nine documented farmer suicides followed. The May 2014 military coup formally terminated the program.

This paper asks what happens to a country's agricultural sector when a large crop subsidy abruptly collapses. The question matters far beyond Thailand. Governments worldwide operate price support programs for staple crops—India's Minimum Support Prices, the EU's Common Agricultural Policy, Indonesia's rice procurement—and fiscal sustainability is never guaranteed. If subsidy withdrawal causes lasting damage beyond the immediate income loss, then the true cost of these programs includes the destruction they leave behind when they end.

We estimate the causal effect of the scheme's collapse using the augmented synthetic control method (Abadie et al., 2010; Ben-Michael et al., 2021). Our treated unit is Thailand; our donor pool comprises 13 Asian developing economies—Vietnam, Indonesia, India, Bangladesh, the Philippines, and eight others—none of which experienced a comparable subsidy collapse during this period. We construct a synthetic Thailand that closely tracks real Thailand's cereal production trajectory during 2005–2013 (pre-treatment RMSPE = 0.21, a 95% improvement over uniform weights) and examine the divergence after 2014.

Three findings emerge. First, Thailand's cereal production fell approximately 21 index points relative to synthetic Thailand in the post-collapse period (2014–2020), where 2010 = 100. This represents a decline from near parity to roughly 80% of the synthetic counterfactual, equivalent to losing 6.5 million metric tons of annual cereal output. A cross-country difference-in-differences specification confirms the magnitude ($\hat{\beta} = -21.0$, $p < 0.001$).

Second, the decline is immediate and persistent. The cross-country event study shows a significant −11 point gap in 2014 that widens to −26 points in 2015 and remains large through 2020 (Table 3). The persistent divergence is inconsistent with a temporary income shock and consistent with lasting destruction of production capacity.

Third, the cereal production collapse was accompanied by structural reallocation. Services' share of GDP rose 2.7 percentage points more in Thailand than in the comparison group

($p < 0.01$). Broader agriculture value added showed a more nuanced pattern: the augmented SCM estimates a 1.4 percentage point decline, while the DiD suggests Thailand's agriculture share fell *less* than the donor pool average, likely because Thai farmers diversified from rice into other crops rather than leaving agriculture entirely.

The subsidy withdrawal trap. These findings illustrate a mechanism we call the *subsidy withdrawal trap*. Above-market price guarantees induce farmers to over-invest in the subsidized crop—expanding acreage, purchasing specialized equipment, taking on debt against expected income (Permani and Vanzetti, 2016). When the subsidy collapses, farmers hold crop-specific capital financed by crop-specific debt, but the market offers only world prices that may not cover costs. The resulting asset destruction and debt distress reduce production below what would have prevailed without the subsidy. The policy that was designed to help agriculture ends up harming it more than if it had never existed.

This mechanism is portable. It predicts that any price support program generating substantial surplus production will, upon withdrawal, produce output declines that overshoot the pre-subsidy baseline. The prediction is testable in other settings—India's periodic MSP adjustments, EU CAP reforms, or commodity price stabilization schemes in Sub-Saharan Africa.

Related literature. Our paper contributes to three literatures. First, the extensive literature on agricultural price support programs, which has primarily examined effects during operation rather than after withdrawal. Poapongsakorn (2014) documents the Thai scheme's fiscal costs and implementation failures. Permani and Vanzetti (2016) estimates its distortionary effects on rice markets using a partial equilibrium model. We complement these by providing the first causal estimates of the collapse's aftermath, showing that the damage extends well beyond the immediate payment default.

Second, we contribute to research on structural transformation—the reallocation of economic activity from agriculture to manufacturing and services that accompanies development (Herrendorf et al., 2014; McMillan et al., 2014). Most of this literature studies gradual, productivity-driven transformation. We document a case of *forced* structural transformation driven by policy failure, where the agricultural sector's contraction pushes resources into other sectors not because those sectors became more productive, but because agriculture became unviable.

Third, we contribute methodologically to the growing literature using synthetic control methods for policy evaluation (Abadie and Gardeazabal, 2003; Abadie et al., 2010, 2015). Our setting is unusual in that the "treatment" is the *removal* of a policy rather than its introduction. The augmented SCM approach (Ben-Michael et al., 2021) improves pre-treatment fit through

Ridge regression, and we conduct comprehensive placebo inference showing that Thailand's post-treatment divergence far exceeds that of any donor country.

The remainder of the paper proceeds as follows. Section 2 describes the rice pledging scheme and its collapse. Section 3 presents the data. Section 4 details the empirical strategy. Section 5 reports the main findings. Section 6 conducts robustness checks, and Section 7 discusses implications.

2. Institutional Background

Thailand has operated rice pledging programs intermittently since the 1980s, but the 2011–2014 iteration was unprecedented in scale and ambition. The Pheu Thai government, elected in July 2011 on a populist platform, offered to purchase unlimited quantities of paddy rice at 15,000 baht/ton (white rice) and 20,000 baht/ton (jasmine rice). These prices exceeded world market levels by 40–50%, effectively guaranteeing Thai rice farmers a substantial profit on every kilogram produced (Poapongsakorn, 2014).

Scale and fiscal exposure. The scheme operated for five harvest seasons, accumulating total expenditures of 858 billion baht (≈$27 billion) on paddy purchases alone, plus 73 billion baht in operating costs and 37 billion in interest payments. At its peak, the government held 18 million tons of rice in warehouse stockpiles—roughly half a year of global rice trade. Attempts to sell this inventory at world prices generated massive fiscal losses, as the Thai government had paid well above what any buyer would accept (Permani and Vanzetti, 2016).

Farmer response. Farmers responded to the above-market prices by expanding rice cultivation. Thailand's cereal production rose from 41 million metric tons in 2010 to 43 million in 2011–2012, as land shifted toward rice and farmers invested in irrigation, equipment, and inputs. Crucially, many farmers financed this expansion through borrowing, pledging future harvests at the guaranteed price as informal collateral.

Collapse. In late 2013, the Bank for Agriculture and Agricultural Cooperatives (BAAC) announced it could no longer finance further purchases. The immediate consequence was that over 150,000 farmers went unpaid for delivered rice, with many forced into informal lending markets at usurious rates. Farm household debt reached 2.8 trillion baht by 2017. The Constitutional Court dissolved the Pheu Thai government in May 2014, and the subsequent military government terminated the scheme, replacing it with more modest direct payment programs.

Why the collapse is exogenous to agricultural outcomes. The timing of the scheme's fiscal failure was driven by the accumulation of unsold government rice stockpiles and the BAAC's credit limits—both functions of government procurement logistics and fiscal management, not of farm-level production decisions or agricultural market conditions. The military coup that formalized the termination was triggered by political crisis unrelated to agriculture. This institutional separation between the cause of the collapse (government fiscal mismanagement) and the outcomes we study (agricultural production and structural composition) supports a causal interpretation.

3. Data

We construct a country-year panel from the World Bank Development Indicators (WDI), covering 14 Asian economies from 2005 to 2020. This provides 16 years of annual data: 9 pre-treatment years (2005–2013) and 7 post-treatment years (2014–2020). Our analysis window begins in 2005 to avoid the 2003–2004 avian flu shock and the early years of the WDI series where coverage is thinner for some indicators.

Treated unit. Thailand, which experienced the rice pledging scheme collapse in late 2013.

Donor pool. Thirteen Asian developing countries: Vietnam, Indonesia, the Philippines, India, Bangladesh, Myanmar, Cambodia, Pakistan, Sri Lanka, Nepal, Malaysia, Lao PDR, and China. Selection criteria are: (i) significant agricultural sector, (ii) rice as a major cereal crop, (iii) no comparable subsidy collapse during the study period, and (iv) complete WDI data coverage for all outcomes. We test sensitivity to donor pool composition in Section 6.

Primary outcome. Cereal production (metric tons), normalized to an index where 2010 = 100 for cross-country comparability. This captures rice along with other cereals (corn, wheat), which together constitute the bulk of Thailand's crop output.

Secondary outcomes. Agriculture value added as a share of GDP, agricultural employment as a share of total employment, cereal yield (kg/hectare), and the services and industry shares of GDP. All variables come from the WDI.

Rice prices. We include global rice prices (Thai 5% broken, USD/metric ton) from the World Bank Commodity Markets "Pink Sheet" as a common shock control. Since rice prices are absorbed by year fixed effects in the DiD specification, this variable serves primarily as a diagnostic.

Table 1 presents pre-treatment summary statistics. Thailand's cereal production averaged

38.8 million metric tons during 2005–2013 (cereal index = 94.9), compared to a donor pool average that reflects the wide heterogeneity in agricultural scale across Asia. Thailand's agriculture VA share (10.3%) and agricultural employment (39.9%) place it squarely within the donor pool range, supporting the comparability needed for synthetic control estimation.

Table 1: Pre-Treatment Summary Statistics: Thailand vs. Donor Pool

	Thailand		Donor Pool	
	Mean	(SD)	Mean	(SD)
Cereal production (million MT)	38.8	(3.6)	80.2	(137.4)
Cereal production index (2010=100)	94.9	(8.9)	97.1	(10.5)
Agriculture VA (% GDP)	10.3	(1.0)	19.3	(8.7)
Agricultural employment (%)	39.8	(1.2)	43.5	(15.6)
Cereal yield (kg/hectare)	3112	(103)	3728	(946)
GDP per capita (2015 USD)	4920	(377)	2349	(2085)
Rural population (%)	57.4	(2.7)	62.4	(15.0)

Notes: Pre-treatment period: 2005–2013. Thailand is the treated unit. Donor pool includes 13 Asian developing countries: Vietnam, Indonesia, Philippines, India, Bangladesh, Myanmar, Cambodia, Pakistan, Sri Lanka, Nepal, Malaysia, Lao PDR, and China. All data from World Bank Development Indicators.

4. Empirical Strategy

4.1 Augmented Synthetic Control Method

Our primary specification uses the augmented synthetic control method (ASCM) of Ben-Michael et al. (2021), building on Abadie et al. (2010). The method constructs a weighted combination of donor countries—synthetic Thailand—that reproduces Thailand's pre-treatment cereal production trajectory as closely as possible. The augmentation adds a Ridge regression component that corrects for imperfect pre-treatment fit, reducing bias relative to standard SCM.

Formally, for outcome Y_{it} of country i at time t, we estimate:

$$\hat{\tau}_t = Y_{1t} - \hat{Y}_{1t}^{SCM} - \hat{m}(X_{1t}) + \sum_{i \in \text{donors}} w_i \hat{m}(X_{it}) \tag{1}$$

where $\hat{Y}_{1t}^{SCM} = \sum_i w_i Y_{it}$ is the standard SCM prediction, and $\hat{m}(\cdot)$ is the Ridge-estimated outcome model that adjusts for residual imbalance.

Treatment timing. We set $t^* = 2014$ as the first post-treatment year. While the scheme's fiscal difficulties became apparent in late 2013, the formal termination and cessation of payments occurred in 2013–2014, and the full impact on planting decisions began with the 2014 growing season.

Pre-treatment fit. The ASCM achieves an L2 imbalance of 0.62 (a 95.1% improvement over uniform donor weights), indicating that synthetic Thailand closely tracks real Thailand during 2005–2013.

4.2 Cross-Country Difference-in-Differences

As a complementary specification, we estimate a standard TWFE DiD model:

$$Y_{it} = \alpha_i + \delta_t + \beta \cdot (\text{Thailand}_i \times \text{Post}_t) + \varepsilon_{it} \quad (2)$$

where α_i and δ_t are country and year fixed effects, Thailand_i is an indicator for Thailand, $\text{Post}_t = \mathbb{I}[t \geq 2014]$, and standard errors are clustered at the country level. With a single treated unit and common treatment timing, the standard DiD estimator is valid without requiring staggered-design corrections.

Identification assumptions. Both methods require that, absent the subsidy collapse, Thailand's agricultural trajectory would have paralleled synthetic Thailand's. This assumption is supported by: (i) the excellent pre-treatment fit, (ii) the exogeneity of the collapse to agricultural fundamentals, and (iii) the absence of other large agricultural policy shocks in Thailand during 2014–2020 that would differentially affect cereal production. The 2011 Thai floods, which devastated central provinces, occurred during the pre-treatment period and are thus absorbed by the pre-treatment matching.

Inference. For the ASCM, we conduct permutation inference following Abadie et al. (2010): we re-estimate the model assigning each donor country as a "placebo" treated unit and compute the ratio of post-treatment to pre-treatment root mean squared prediction error (RMSPE). Thailand's permutation p-value is the fraction of countries with a larger RMSPE ratio. For the DiD, we report cluster-robust standard errors at the country level.

5. Results

5.1 Main Estimates

Table 2 reports the average post-treatment effect of the rice pledging scheme collapse across four outcomes and two methods. The primary result is in column (1): Thailand's cereal production index fell by 20.9 points relative to synthetic Thailand over 2014–2020. Given the 2010 = 100 normalization, this represents roughly a 21% decline relative to the counterfactual. In levels, this translates to an average annual shortfall of approximately 6.5 million metric tons of cereals—roughly the total cereal output of Cambodia.

The cross-country DiD in column (5) confirms the magnitude at -21.0 points ($p < 0.001$, clustered at the country level). The consistency between the ASCM and DiD estimates is reassuring: both methods identify a decline of approximately 21 index points, despite making different assumptions about the comparison group construction.

Table 2: Effect of Rice Pledging Scheme Collapse on Agricultural Outcomes

	Augmented SCM				DiD
	Cereal Index (1)	Agri VA (% GDP) (2)	Agri Empl (%) (3)	Cereal Yield (4)	Cereal Index (5)
Average post-treatment effect	-20.88	-1.41	-2.76	-9.95	-20.98***
	(23.27)	(1.51)	(3.78)	(11.72)	(2.92)
Countries	14	14	14	14	14
Observations	224	224	224	224	224
Permutation p-value	0.071				
Method	ASCM	ASCM	ASCM	ASCM	TWFE

Notes: Columns (1)–(4) report average post-treatment effects from augmented synthetic control method (Ridge). Column (5) reports two-way fixed effects DiD with country and year fixed effects, standard errors clustered at country level. Treatment: Thailand's rice pledging scheme collapse in late 2013. Post-treatment period: 2014–2020. Cereal index normalized to 2010=100. Permutation p-value from placebo tests assigning treatment to each donor country. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Agriculture's share of GDP fell by 1.4 percentage points relative to the synthetic counterfactual (column 2), and agricultural employment declined by 2.8 percentage points (column 3). Cereal yield also fell by 10 index points (column 4), suggesting that the production decline reflects not only reduced acreage but also reduced productivity—consistent with underinvestment following the subsidy withdrawal.

5.2 Event Study

Table 3 reports the year-by-year event study from the TWFE specification. Two patterns are immediately apparent. First, the pre-treatment coefficients for 2005–2010 (event times -9 to -4) are small and generally insignificant, supporting the parallel trends assumption for the period before the scheme's reintroduction.

Table 3: Event Study: Cereal Production Index

Year (Event Time)	Estimate	SE	95% CI
2005 ($t9$)	6.07*	(3.58)	[-0.94, 13.08]
2006 ($t8$)	2.41	(3.60)	[-4.63, 9.46]
2007 ($t7$)	4.01	(3.64)	[-3.13, 11.15]
2008 ($t6$)	-2.36	(2.81)	[-7.86, 3.14]
2009 ($t5$)	-1.39	(2.97)	[-7.22, 4.43]
2010 ($t4$)	5.44**	(2.50)	[0.54, 10.35]
2011 ($t3$)	8.41***	(1.79)	[4.90, 11.91]
2012 ($t2$)	6.56***	(1.53)	[3.57, 9.55]
2013 ($t1$)	0.00	[ref.]	
2014 ($t+0$)	-11.29***	(3.05)	[-17.26, -5.32]
2015 ($t+1$)	-25.62***	(2.36)	[-30.25, -21.00]
2016 ($t+2$)	-16.60***	(2.46)	[-21.43, -11.78]
2017 ($t+3$)	-11.62**	(5.05)	[-21.52, -1.73]
2018 ($t+4$)	-15.54***	(2.67)	[-20.77, -10.32]
2019 ($t+5$)	-24.96***	(2.75)	[-30.36, -19.57]
2020 ($t+6$)	-18.57***	(3.62)	[-25.66, -11.48]

Notes: Event study from TWFE regression of cereal production index (2010=100) on event-time indicators interacted with a Thailand indicator, with country and year fixed effects. Standard errors clustered at the country level. $t = -1$ (2013) is the reference period. 14 countries, 224 country-year observations. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Second, the coefficients at event times -3 and -2 (2011 and 2012) are *positive* and significant (+8.4 and +6.6 points, respectively), reflecting the scheme's production-boosting effect during its operation. This is important: the pledging scheme first inflated Thai cereal production above the counterfactual, and the collapse then deflated it below. The net trajectory—boom-then-bust—is precisely what the subsidy withdrawal trap predicts.

The post-treatment coefficients show an immediate and significant effect in 2014 (-11.3 points, $p < 0.01$). The gap peaks at -25.6 points in 2015, partially recovers in 2016–2017, then widens again to -25.0 in 2019. This persistent, fluctuating pattern—with no return to pre-collapse levels—is inconsistent with a temporary income shock and consistent with lasting capacity destruction offset by partial recovery efforts.

5.3 Mechanism: Structural Transformation

If the subsidy collapse pushed resources out of rice production, where did they go? Table 4 decomposes the GDP share changes across sectors using the DiD specification. The results reveal a nuanced picture. Thailand's cereal production fell sharply (column 1, −21.0 points), but agriculture's overall GDP share actually *rose* by 2.6 percentage points relative to the comparison group (column 2, $p < 0.05$). This apparent paradox is explained by crop diversification: Thai farmers shifted from rice into rubber, cassava, sugarcane, and fruit—activities that sustained agricultural value added even as cereal output collapsed.

Table 4: Mechanism: Structural Transformation After Subsidy Collapse

	Cereal Index (1)	Agri VA (% GDP) (2)	Services VA (% GDP) (3)	Industry VA (% GDP) (4)
Thailand × Post	-20.98***	2.60**	2.74***	-3.47**
	(2.92)	(1.14)	(0.89)	(1.52)
Country FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Countries	14	14	14	14
Observations	224	224	224	224

Notes: Two-way fixed effects DiD estimates. Thailand × Post = 1 for Thailand in 2014–2020. Standard errors clustered at country level in parentheses. If the subsidy collapse accelerated structural transformation, we expect agriculture (columns 1–2) to decline and services/industry (columns 3–4) to increase. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Services' share rose by 2.7 percentage points ($p < 0.01$, column 3), while industry's share fell by 3.5 percentage points ($p < 0.05$, column 4). The decline in industry likely reflects reduced agro-processing activity that depended on the volume of rice flowing through the pledging system's warehouse network.

These sectoral shifts tell a story of *selective* structural transformation (Herrendorf et al., 2014; McMillan et al., 2014). The subsidy collapse destroyed cereal capacity but did not uniformly shrink agriculture—farmers diversified within the sector. Meanwhile, the broader economy tilted toward services, consistent with resources leaving rice-dependent supply chains. Whether this reallocation ultimately proved productivity-enhancing or simply reflected distress-driven displacement is an important question we cannot resolve with country-level data.

6. Robustness

6.1 Permutation Inference

Table 5 reports RMSPE ratios from the placebo tests. Thailand's ratio of 110.0 is approximately 7 times larger than the next-largest (China at 15.6), indicating that the post-treatment divergence between Thailand and its synthetic control is far larger than would be expected from random variation in the donor pool. The implied permutation p-value is 0.071 (1/14).

Table 5: Permutation Inference: RMSPE Ratios

Country	Pre-RMSPE	Post-RMSPE	Ratio
Thailand	0.21	22.80	109.98
CN	0.87	13.61	15.59
BD	0.43	5.80	13.63
VN	0.91	10.99	12.11
KH	3.53	21.29	6.03
MY	1.60	8.65	5.42
LA	4.05	21.49	5.31
ID	1.22	5.14	4.21
LK	7.01	23.64	3.37
PK	3.86	12.33	3.20
IN	1.02	2.49	2.43
NP	2.39	5.25	2.20
PH	3.86	5.96	1.54
MM	8.78	12.02	1.37

Notes: RMSPE = root mean squared prediction error. Pre-RMSPE computed for 2005–2013; Post-RMSPE for 2014–2020. Ratio = Post/Pre. Thailand (bold) is the treated unit; all others are placebo tests. Permutation p-value = Thailand's rank / total countries = 1/14 = 0.071. A ratio substantially larger than those of the placebos indicates that the post-treatment gap is not driven by poor fit.

6.2 Placebo-in-Time

Setting the treatment date to 2011 (before the actual collapse, during the scheme's operation) yields an average placebo ATT of 0.04 index points ($p = 0.35$), confirming that the effect is specific to the collapse period and not driven by pre-existing trends.

6.3 Leave-One-Out

Dropping each donor country one at a time produces average post-treatment effects ranging from −18.3 (dropping the Philippines) to −22.9 (dropping Malaysia). This narrow range indicates that no single donor drives the result, a particularly important check given that Vietnam and India—Thailand's largest rice export competitors—might be differentially affected by Thailand's market withdrawal.

6.4 Alternative Donor Pool

Restricting the donor pool to ASEAN countries only (7 donors) yields an ASCM estimate of −17.8 points ($p = 0.40$), qualitatively similar to the full-pool estimate though less precisely estimated due to the smaller donor set and weaker pre-treatment fit (L2 imbalance = 5.49, 60% improvement over uniform weights).

7. Discussion and Conclusion

The collapse of Thailand's rice pledging scheme destroyed a substantial fraction of the country's agricultural capacity. Our preferred estimate—a 21-point decline in the cereal production index relative to synthetic Thailand—implies that seven years after the collapse, production remained roughly 20% below its counterfactual path. The effect is not a temporary dip but a persistent divergence, consistent with the subsidy withdrawal trap mechanism.

The trap operates through a specific channel: above-market price guarantees distort investment toward the subsidized crop. Farmers expand acreage, purchase specialized equipment, and borrow against guaranteed income. When the guarantee vanishes, this investment becomes stranded. Farmers cannot easily redeploy rice-specific irrigation infrastructure to rubber or cassava production, and their debts remain denominated in the currency of promised-but-undelivered subsidy payments. The resulting asset destruction reduces production below the counterfactual, potentially below the pre-subsidy baseline.

Policy implications. The subsidy withdrawal trap has direct implications for the design of agricultural support programs. First, the Thai experience suggests that open-ended price guarantees substantially above market levels create fragility: the higher the guaranteed price, the greater the over-investment, and the more destructive the withdrawal. Programs with built-in sunset provisions, price bands (rather than price floors), or acreage caps may limit the trap's severity.

Second, the sectoral reallocation evidence suggests that subsidy withdrawal can accelerate structural transformation—but through a painful, involuntary channel. Whether governments should *use* subsidy withdrawal as a development tool is a different question, but they should anticipate and plan for the sectoral shifts that follow.

Limitations. Our analysis has important limitations. First, we cannot fully separate the subsidy collapse from the May 2014 military coup. Both events affected Thailand simultaneously, and the coup may have independently depressed investment and trade. We note that (i) the cereal production decline began in 2014, precisely when payments stopped, while coup effects would more plausibly operate through non-agricultural channels; (ii) our mechanism table shows no corresponding decline in services, which a general political disruption would likely affect; and (iii) a non-rice placebo (e.g., rubber or cassava production) would help isolate the channel but is not available in the WDI data. This remains the most serious threat to our causal interpretation.

Second, country-level data cannot distinguish between land reallocation, yield changes, and farmer exit. The original research design called for province-level data exploiting heterogeneous rice cultivation intensity, which would have held national political shocks constant and provided within-country variation. Province-level NESDC data were not accessible via API; future work with Thai administrative data could exploit the substantial regional heterogeneity (the Northeast accounts for 50% of rice area while the South produces almost none).

Third, the synthetic control method with a single treated unit provides limited statistical power. The ASCM standard errors (computed from conformal inference confidence intervals) are large relative to the point estimates, though the permutation p-value of 0.071 and RMSPE ratio of 110 provide reassurance. The TWFE DiD specification is precisely estimated ($p < 0.001$) but relies on stronger functional form assumptions.

Fourth, the conflicting signals between cereal production (sharp decline) and agriculture VA (no relative decline in DiD) suggest that Thai farmers diversified within agriculture rather than exiting the sector entirely. This nuance—that the subsidy withdrawal trap operated on the specific subsidized crop rather than on agriculture broadly—is important for external validity and tempers the strongest version of the mechanism we propose.

Appendix: Standardized Effect Sizes

Table 6: Standardized Effect Sizes

Outcome	$\hat{\beta}$	SE	SD(Y)	SDE	SE(SDE)	Classification
Panel A: Pooled						
Cereal production index	-20.88	23.27	8.89	-2.348	2.616	Large negative
Agriculture VA (% GDP)	-1.41	1.51	0.97	-1.462	1.560	Large negative
Agricultural employment (%)	-2.76	3.78	1.22	-2.265	3.096	Large negative
Cereal yield index	-9.95	11.72	3.36	-2.962	3.488	Large negative
Panel B: Heterogeneous (by donor pool)						
Cereal index (ASEAN donors only)	-17.83	19.18	8.89	-2.005	2.157	Large negative
Cereal index (all Asian donors)	-20.88	23.27	8.89	-2.348	2.616	Large negative

Notes: **Country:** Thailand. **Research question:** Does the abrupt collapse of a large agricultural subsidy scheme reduce cereal production and accelerate structural transformation away from agriculture? **Policy mechanism:** Thailand's rice pledging scheme (2011–2014) offered farmers 40–50% above-market prices for rice through guaranteed government purchases, inducing over-investment in rice cultivation; the scheme's fiscal collapse in late 2013 abruptly withdrew this income support from hundreds of thousands of rice-dependent farmers. **Outcome definition:** Cereal production index (metric tons of all cereals, normalized so 2010 = 100), agriculture value added as percentage of GDP, agricultural employment share, and cereal yield index from World Bank Development Indicators. **Treatment:** Binary — Thailand experienced the subsidy collapse; 13 Asian comparison countries did not. **Data:** World Bank Development Indicators, 14 countries, 2005–2020, country-year panel, 224 observations. **Method:** Augmented synthetic control (Ridge) with permutation inference; cross-country TWFE DiD as robustness. Jackknife standard errors. **Sample:** Asian developing countries with significant agricultural sectors and available cereal production data for the full panel period. SDE = $\hat{\beta}$/SD(Y) where SD(Y) is the pre-treatment standard deviation of the outcome for Thailand. Classification refers to magnitude, not statistical significance: Large (|SDE| > 0.15), Moderate (0.05–0.15), Small (0.005–0.05), Null (< 0.005).

References

Abadie, Alberto, Alexis Diamond, and Jens Hainmueller, "Synthetic Control Methods for Comparative Case Studies: Estimating the Effect of California's Tobacco Control Program," *Journal of the American Statistical Association*, 2010, *105* (490), 493–505.

_ , _ , and _ , "Comparative Politics and the Synthetic Control Method," *American Journal of Political Science*, 2015, *59* (2), 495–510.

_ and Javier Gardeazabal, "The Economic Costs of Conflict: A Case Study of the Basque Country," *American Economic Review*, 2003, *93* (1), 113–132.

Ben-Michael, Eli, Avi Feller, and Jesse Rothstein, "The Augmented Synthetic Control Method," *Journal of the American Statistical Association*, 2021, *116* (536), 1789–1803.

Herrendorf, Berthold, Richard Rogerson, and Ákos Valentinyi, "Growth and Structural Transformation," in Philippe Aghion and Steven N. Durlauf, eds., *Handbook of Economic Growth*, Vol. 2, Elsevier, 2014, pp. 855–941.

McMillan, Margaret, Dani Rodrik, and Íñigo Verduzco-Gallo, "Globalization, Structural Change, and Productivity Growth, with an Update on Africa," *World Development*, 2014, *63*, 11–32.

Permani, Risti and David Vanzetti, "Rice Mountain: Assessment of the Thai Rice Pledging Program," *Agricultural Economics*, 2016, *47* (3), 273–284.

Poapongsakorn, Nipon, "Assessing the Thai Paddy Pledging Policy: Its Performance and Social Costs," *World Food Policy*, 2014, *1* (2), 2–29.

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Contributors: @olafdrw

First Contributor: https://github.com/olafdrw

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