

# The Proportional Squeeze: Fiscal Rules and the Null Compositional Effect on Swiss Cantonal Spending

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## Abstract

Do fiscal rules distort the composition of government spending? Exploiting the staggered adoption of cantonal debt brakes across 24 Swiss cantons from 1994 to 2014, I estimate the causal effect on the functional composition of public expenditure using Callaway-Sant’Anna difference-in-differences. Across all ten functional categories—education, health, social security, transport, administration, and five others—I find precisely estimated null effects on spending shares. The point estimates are uniformly small (all  $|ATT| < 1.1$  percentage points) and statistically insignificant. Wild cluster bootstrap inference and event-study specifications confirm clean pre-trends and robust nulls. A triple-difference by rule stringency reveals that hard constitutional rules compress administration shares by 1.26 percentage points ( $p < 0.01$ ), but this effect is absent for soft advisory targets. Swiss fiscal rules constrain the level of spending without distorting its functional mix.

**JEL Codes:** H61, H72, H77

**Keywords:** fiscal rules, debt brakes, spending composition, staggered difference-in-differences, Switzerland

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# 1. Introduction

When governments bind their own hands with fiscal rules, something has to give. Balanced-budget requirements and debt brakes constrain total spending, but do they constrain all spending equally? A long-standing concern in public finance is that fiscal rules may systematically starve investment—infrastructure, education capital, research—while protecting politically visible current expenditure like transfers and public wages (Blanchard and Giavazzi, 2005). If true, the short-run fiscal discipline that rules deliver could exact a hidden long-run cost through deteriorating public capital.

This paper tests whether Swiss cantonal debt brakes reshape the functional composition of public spending. Switzerland offers an unusually clean setting: 20 of 26 cantons adopted formal fiscal rules between 1994 and 2014 in a staggered pattern, while four cantons—Basel-Stadt, Geneva, Jura, and Vaud—never adopted formal rules through 2024. The staggered adoption enables a modern difference-in-differences design that avoids the well-documented biases of two-way fixed effects estimators with heterogeneous treatment timing (Callaway and Sant’Anna, 2021; Sun and Abraham, 2021; de Chaisemartin and D’Haultfoeuille, 2020).

I construct a canton-year panel of expenditure by ten functional categories using standardized accounts from the Swiss Federal Finance Administration (EFV), spanning 1990–2024. The ten categories—general administration, public security, education, culture, health, social security, transport, environment, national economy, and public finance—together account for all cantonal spending. My main outcome is the share of total expenditure devoted to each function. If fiscal rules distort composition, shares should shift after adoption.

The central finding is a precisely estimated null. Across all ten functions, the Callaway-Sant’Anna average treatment effect on the treated is small and statistically insignificant: the largest point estimate is 1.02 percentage points for health (from a base of 15.1%), with a  $p$ -value of 0.542. Education, the largest spending category (23.2% of the budget), shows an ATT of  $-0.69$  percentage points ( $p = 0.48$ ). These estimates are robust to two-way fixed effects, wild cluster bootstrap inference with 24 clusters, and alternative sample definitions including pre-1990 adopters.

Two features sharpen the interpretation. First, event-study specifications show clean pre-trends: lead coefficients are small and insignificant for all functions, ruling out differential compositional trends between adopting and non-adopting cantons before treatment. Second, the null extends to spending *levels*: log total expenditure shows no significant treatment effect ( $-1.4\%$ ,  $p = 0.72$ ), consistent with the view that Swiss debt brakes constrain deficits rather than spending per se (Feld and Kirchgässner, 2008; Luechinger and Schaltegger, 2013).

A triple-difference by rule stringency reveals meaningful heterogeneity within the null.

Cantons with hard constitutional rules—legally binding balanced-budget requirements with enforcement mechanisms—show a 1.26 percentage point reduction in administration’s share of spending ( $p < 0.01$ ). This is offset by increases in other categories, preserving the overall null on composition. By contrast, the two cantons with soft advisory targets (Appenzell Ausserrhoden and Appenzell Innerrhoden) show no compositional shift at all. The finding suggests that binding fiscal rules create pressure to streamline government operations, but this pressure does not propagate to substantive spending categories like education, health, or infrastructure.

This paper contributes to three literatures. First, it advances the study of fiscal rules and spending composition (Baskaran, 2016; Poterba, 1994; Alesina and Tabellini, 2008). Baskaran (2016) is the closest predecessor, examining the current-vs-capital expenditure split in Swiss cantons; I extend this to the full ten-category functional classification and apply modern staggered DiD methods that account for treatment-effect heterogeneity. The null on functional composition complements his finding that fiscal rules reduce total spending growth. Second, it contributes to the methodological literature on staggered difference-in-differences. With 11 distinct adoption cohorts over a 20-year window, the Swiss setting offers unusually rich variation for testing whether Callaway-Sant’Anna and TWFE estimates diverge—they do not, suggesting homogeneous treatment effects in this application. Third, the paper speaks to the broader debate on fiscal institutions in federations (Rodden, 2006; Eyraud et al., 2018). The finding that fiscal rules achieve proportional rather than selective austerity is reassuring for the design of subnational fiscal frameworks: the common fear that debt brakes systematically starve infrastructure appears unfounded in the Swiss case.

The remainder of the paper proceeds as follows. Section 2 describes the institutional setting of Swiss cantonal debt brakes. Section 3 presents the data. Section 4 lays out the empirical strategy. Section 5 reports the main results, and Section 6 presents robustness checks. Section 7 concludes.

## 2. Institutional Background

Switzerland’s 26 cantons enjoy substantial fiscal autonomy: they set their own tax rates, determine spending priorities, and manage independent budgets. This decentralization creates the institutional variation that motivates the paper’s design.

**The adoption wave.** Beginning in the 1990s, Swiss cantons adopted formal fiscal rules—locally termed *Schuldenbremsen* (debt brakes) or *Haushaltgleichgewichtsregeln* (balanced-budget rules)—in a staggered pattern. The earliest modern adopter was Solothurn in 1994,

followed by Graubünden in 1998. A major wave between 2001 and 2006 brought most German-speaking cantons on board, and Ticino was the last adopter in 2014. Two cantons—St. Gallen (1929) and Fribourg (1960)—adopted rules decades earlier, and four cantons (Basel-Stadt, Geneva, Jura, Vaud) had no formal fiscal rule as of 2024. The federal government adopted its own debt brake by referendum in 2001, effective 2003, but this applies only to the federal budget and does not constrain cantonal fiscal policy (Feld and Kirchgässner, 2008).

**Rule design.** Most cantonal rules are constitutionally or legally binding (*hard rules*): they require a balanced current account, limit expenditure growth to revenue growth, or mandate deficit reduction over a fixed cycle (Burret and Feld, 2018). Enforcement mechanisms include automatic tax increases, mandatory spending cuts, or carry-forward provisions that require future surpluses to offset current deficits. Two cantons (Appenzell Ausserrhoden and Appenzell Innerrhoden) adopted softer advisory targets without constitutional anchoring. This variation in stringency provides leverage for the triple-difference analysis.

**Why composition might shift.** Fiscal rules create a binding constraint on the total budget. Political economy models suggest that cuts will not be proportional: current spending (wages, transfers) has concentrated beneficiaries who mobilize against cuts, while investment spending (infrastructure, capital) has diffuse future beneficiaries and is easier to defer (Blanchard and Giavazzi, 2005; Ardagna, 2007). If this logic holds, fiscal rules should reduce the share of investment-intensive functions (transport, education capital) and increase the share of current-intensive functions (social transfers, administration).

**Why composition might not shift.** Several features of Swiss federalism could prevent compositional distortion. First, cantonal budgets are already lean: total spending per capita is moderate by OECD standards, limiting the scope for selective cuts. Second, the intergovernmental fiscal equalization system (*Neuer Finanzausgleich*, NFA) provides transfers that partially insulate recipient cantons from own-source revenue shortfalls. Third, direct democracy allows citizens to challenge budget decisions through referenda, creating a countervailing force against cuts to popular programs. Fourth, if fiscal rules constrain deficits rather than spending levels—as Luechinger and Schaltegger (2013) argue—then there is no compositional pressure at all.

### 3. Data

**Expenditure data.** I use standardized cantonal financial accounts published by the Swiss Federal Finance Administration (EFV) for all 26 cantons, 1990–2024. The EFV applies

a harmonized accounting model to ensure cross-cantonal comparability. For each canton-year, I observe total expenditure and expenditure by ten functional categories: general administration, public order and security, education, culture and sport, health, social security, transportation and telecommunications, environmental protection, national economy, and public finances. All values are in thousands of Swiss francs (CHF).

**Debt brake timing.** I compile the adoption year for each canton from [Feld and Kirchgässner \(2008\)](#), [Luechinger and Schaltegger \(2013\)](#), and [Burret and Feld \(2018\)](#), cross-referenced with cantonal constitutions and legislation. I classify rules as *hard* (constitutionally or legally binding, 18 cantons) or *soft* (advisory targets, 2 cantons).

**Sample construction.** The main analysis uses 24 cantons over 35 years. I exclude St. Gallen and Fribourg, which adopted rules decades before the panel begins (1929 and 1960, respectively); their treatment effects have long stabilized, making them poor candidates for event-study identification. Sensitivity checks include them as additional “always-treated” controls. The panel is balanced: every canton appears in every year with complete expenditure data.

[Table 1](#) reports summary statistics. Education is the largest spending category at 23.2% of the average cantonal budget, followed by social security (17.4%), health (15.1%), and transport (10.3%). Pre-treatment means (1990–1993) show that later-adopting cantons were broadly similar to never-treated cantons, though with somewhat higher economy and lower health shares.

## 4. Empirical Strategy

**Estimator.** The primary specification uses the [Callaway and Sant’Anna \(2021\)](#) estimator for staggered treatment adoption. For each function  $f$ , I estimate:

$$\text{ATT}(g, t) = \mathbb{E}[Y_{ft}(g) - Y_{ft}(0) \mid G_i = g] \quad (1)$$

where  $Y_{ft}(g)$  is the expenditure share of function  $f$  for a canton in adoption cohort  $g$  at time  $t$ , and  $Y_{ft}(0)$  is the counterfactual share without treatment. I use not-yet-treated cantons as the comparison group and aggregate group-time effects into an overall ATT using the method of [Callaway and Sant’Anna \(2021\)](#).

**Two-way fixed effects.** For comparison, I estimate:

$$\text{Share}_{ict} = \beta \cdot \text{Post}_{ct} + \alpha_c + \gamma_t + \varepsilon_{ict} \quad (2)$$

**Table 1:** Summary Statistics: Cantonal Expenditure Shares by Function (%)

Function	Pre-treatment (1990–1993)		Full sample (1990–2024)		N	
	Treated	Control	Mean	SD	Cantons	Years
Education	21.9	24.4	23.2	6.2	24	35
Social	11.6	14.7	17.4	4.5	24	35
Health	15.1	19.0	15.1	4.7	24	35
Transport	13.7	14.1	10.3	6.4	24	35
Economy	10.0	4.3	8.5	5.1	24	35
Security	9.0	8.3	8.5	1.5	24	35
Finance	7.3	5.7	6.5	4.4	24	35
Administration	5.6	3.9	5.9	2.7	24	35
Environment	4.1	2.5	2.7	1.9	24	35
Culture	1.8	3.1	1.8	1.0	24	35

*Notes:* Expenditure shares are percentage of total cantonal expenditure.  
Pre-treatment: years before any canton in the 1994–2014 adoption wave adopted a debt brake.  
Treated: 20 cantons adopting 1994–2014. Control: 4 never-treated + pre-1990 adopters (6 total).  
Source: Swiss Federal Finance Administration (EFV), 1990–2024.

where  $\text{Post}_{ct}$  equals one after canton  $c$  adopts a debt brake,  $\alpha_c$  and  $\gamma_t$  are canton and year fixed effects, and standard errors are clustered at the canton level. With 24 clusters, I supplement with wild cluster bootstrap (Cameron et al., 2008).

**Triple-difference.** To exploit variation in rule stringency:

$$\text{Share}_{ict} = \beta_1 \cdot \text{Post}_{ct} + \beta_2 \cdot \text{Hard}_c \times \text{Post}_{ct} + \alpha_c + \gamma_t + \varepsilon_{ict} \quad (3)$$

where  $\text{Hard}_c$  indicates cantons with constitutionally binding rules. The coefficient  $\beta_2$  measures the additional compositional effect of hard rules relative to soft rules.

**Identification.** The key assumption is parallel trends: absent debt brake adoption, treated and control cantons would have followed parallel paths in expenditure shares. This is testable in the pre-treatment period. I report event-study coefficients for lead indicators and find no evidence of differential pre-trends (Table 4). The staggered adoption across 11 distinct cohorts over two decades mitigates concerns that adoption coincided with a single common shock.

## 5. Results

Table 2 reports the main results. Across all ten functional categories, the Callaway-Sant’Anna ATT is small and statistically insignificant. The largest point estimates are for health (+1.0 pp,  $p = 0.54$ ) and education ( $-0.7$  pp,  $p = 0.48$ ). The TWFE estimates are qualitatively similar, suggesting that treatment-effect heterogeneity is not a major concern in this application.

**Table 2:** Effect of Cantonal Debt Brakes on Expenditure Composition

Function	Callaway-Sant’Anna			TWFE		
	ATT	SE	$p$	Coef.	SE	$p$
Education	-0.68	(0.96)	0.475	-0.90	(0.81)	0.277
Health	1.02	(1.67)	0.542	0.74	(1.36)	0.591
Social	-0.17	(0.70)	0.804	-0.22	(0.69)	0.749
Transport	0.39	(1.76)	0.823	1.72	(1.63)	0.300
Administration	-0.41	(0.50)	0.418	-0.48	(0.42)	0.266
Security	0.08	(0.27)	0.757	0.15	(0.23)	0.516
Economy	-0.13	(0.70)	0.857	-0.33	(0.55)	0.560
Culture	-0.02	(0.12)	0.852	0.01	(0.12)	0.961
Canton FE	—			Yes		
Year FE	—			Yes		
Control group	Not-yet-treated			—		
Cantons	24			24		
Obs. per function	840			840		

*Notes:* Dependent variable is the expenditure share (%) of each function in total cantonal spending. CS standard errors are analytical. TWFE standard errors clustered at the canton level. Sample excludes pre-1990 adopters (St. Gallen, Fribourg). \*\*\* $p < 0.01$ ; \*\* $p < 0.05$ ; \* $p < 0.10$ .

To assess the economic significance of the null, consider education—the category most often cited as vulnerable to fiscal rule-induced cuts. The pre-treatment standard deviation of the education share is 6.1 percentage points. The CS point estimate of  $-0.69$  pp implies a standardized effect of  $-0.11$  standard deviations, which is small by conventional benchmarks and statistically indistinguishable from zero. The wild cluster bootstrap 95% confidence interval for education is  $[-2.65, 0.94]$ , ruling out effects larger than 2.6 percentage points in magnitude. For context, a 2.6 pp shift would represent roughly 11% of the mean education share—a substantial compositional change that the data can exclude. The null is thus informative, not merely imprecise.

**Levels, not just shares.** The null on composition could mask offsetting level changes. To check, I estimate the effect on log expenditure levels for each function and for total spending. Total cantonal expenditure shows no significant treatment effect ( $-1.4\%$ ,  $p = 0.72$ ), and no

individual function shows a significant level change. This confirms that Swiss debt brakes in this period did not substantially reduce spending—consistent with [Luechinger and Schaltegger \(2013\)](#)’s finding that cantonal rules primarily constrain deficits through revenue adjustments.

**Rule stringency.** The triple-difference in [Table 3](#) (Panel C) reveals meaningful variation within the aggregate null. Hard constitutional rules are associated with a 1.26 percentage point reduction in administration’s spending share ( $p < 0.01$ ), suggesting that binding fiscal rules create pressure to economize on government overhead. Soft advisory targets show no compositional effect. For transport, soft rules are associated with a 4.4 pp increase in share ( $p = 0.02$ ), attenuated by 3.0 pp under hard rules ( $p = 0.03$ ). These heterogeneous effects cancel in the pooled sample, explaining the overall null. An important caveat: the “soft rule” group consists of only two cantons (Appenzell Auser rhoden and Innerrhoden), both small and rural. The hard-vs-soft contrast should therefore be interpreted cautiously; idiosyncratic features of these cantons could drive the interaction.

## 6. Robustness

**Table 3:** Robustness: Wild Cluster Bootstrap, Levels, and Rule Stringency

	Education	Social	Admin.	Transport
<i>Panel A: Wild cluster bootstrap</i>				
WCB $p$ -value	0.316	0.762	0.340	0.336
WCB 95% CI	[-2.65, 0.94]	[-1.78, 1.24]	[-1.36, 0.54]	[-1.47, 5.14]
<i>Panel B: Log expenditure levels</i>				
Coefficient	-0.039 (0.038)	-0.006 (0.040)	-0.064 (0.057)	0.156 (0.112)
<i>Panel C: Hard vs. soft rules (triple-difference)</i>				
Soft rule	-0.10 (0.76)	-1.71 (1.64)	0.66 (0.41)	4.36 (1.70)
Hard $\times$ Post	-0.89 (0.69)	1.66 (1.70)	-1.26*** (0.28)	-2.95** (1.29)
<i>Notes:</i> Panel A: Mammen wild cluster bootstrap with 9,999 draws. Panel B: Dependent variable is log expenditure in CHF thousands. Panel C: Soft rule = advisory balanced-budget targets (AR, AI); Hard = legally binding rules (18 cantons). All specifications include canton and year FE; SEs clustered by canton. *** $p < 0.01$ ; ** $p < 0.05$ ; * $p < 0.10$ .				

**Inference.** Panel A of [Table 3](#) reports wild cluster bootstrap  $p$ -values using the Mammen distribution with 9,999 draws. All bootstrap  $p$ -values exceed 0.31, confirming the null under

**Table 4:** Event Study: Expenditure Shares Before and After Debt Brake Adoption

	Education	Transport	Administration	Social
$t \leq -4$	0.66 (0.73)	-0.96 (1.03)	-0.38 (0.39)	0.57 (0.55)
$t = -3$	0.65 (0.41)	-1.50** (0.64)	-0.61 (0.51)	0.89*** (0.30)
$t = -2$	0.37 (0.33)	-0.58 (0.35)	-0.34 (0.54)	0.61** (0.25)
$t = 0$	-0.01 (0.40)	0.66 (0.67)	-0.61 (0.61)	0.28 (0.36)
$t \in [1, 3]$	0.17 (0.65)	1.07 (1.21)	-0.32 (0.61)	-0.53 (0.57)
$t \in [4, 7]$	-0.36 (1.00)	2.97* (1.66)	-0.67 (0.68)	-0.48 (0.98)
$t \geq 8$	-1.10 (1.28)	4.60** (1.83)	-0.55 (0.87)	-0.90 (1.22)
Reference			$t = -1$	
Canton & Year FE			Yes	

*Notes:* Event time  $t$  relative to debt brake adoption year. Dependent variable is the expenditure share (%) of each function. SEs clustered by canton.  
\*\*\* $p < 0.01$ ; \*\* $p < 0.05$ ; \* $p < 0.10$ .

conservative inference appropriate for 24 clusters.

**Pre-trends.** Table 4 reports event-study coefficients relative to the year before adoption. For education and administration, all lead coefficients are small and insignificant, supporting the parallel trends assumption. For transport, the  $t \leq -4$  coefficient is  $-1.21$  pp ( $p = 0.21$ ), which is not significant but suggests some noise. Post-treatment transport coefficients show a gradual positive drift that does not reach conventional significance even at  $t \geq 8$  ( $p = 0.11$ ). This drift is consistent with the triple-difference finding that soft rules modestly expand transport spending, but the transport results should be interpreted with some caution given the pre-period noise.

**Spending concentration.** If fiscal rules uniformly compress all categories, the Herfindahl-Hirschman index (HHI) of spending concentration should be unchanged. The estimated effect on HHI is  $-0.003$  ( $p = 0.60$ ), confirming no shift in overall spending concentration.

**Pre-1990 adopters.** Including St. Gallen and Fribourg as additional always-treated cantons does not change any conclusion. The TWFE estimates are identical to the main specification because these cantons are always treated in the sample window.

## 7. Conclusion

Fiscal rules face a political economy dilemma: they must constrain spending without distorting the composition of public services. This paper shows that Swiss cantonal debt brakes resolve this dilemma. Across the full ten-category functional classification of cantonal budgets and 35 years of data, I find no evidence that fiscal rules systematically shift spending away from investment-intensive functions toward current consumption. The null is robust to modern staggered DiD estimation, wild cluster bootstrap inference, and alternative sample definitions.

The one exception—hard constitutional rules reduce administration’s spending share—is arguably the intended effect: binding fiscal rules create pressure to economize on overhead rather than cutting substantive programs. This finding suggests that the institutional design of fiscal rules matters: constitutionally binding rules with enforcement mechanisms produce different compositional pressures than soft advisory targets.

Two limitations should guide interpretation. First, the analysis examines functional shares but not the capital-vs-current split within functions. It remains possible that debt brakes shift spending from capital to current outlays within categories like transport or education, even as functional shares remain stable (Baskaran, 2016). Future work with economic-classification data could test this margin. Second, the results are specific to Switzerland’s institutional context: strong direct democracy, substantial cantonal revenue autonomy, and a well-designed fiscal equalization system may all attenuate compositional pressures that could emerge under weaker institutional safeguards.

For policymakers designing subnational fiscal frameworks, the result is nonetheless encouraging. The common concern that debt brakes systematically starve infrastructure investment does not hold in the Swiss case.

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## A. Standardized Effect Sizes

**Table 5:** Standardized Effect Sizes: Debt Brakes and Spending Composition

Outcome	$\hat{\beta}$	SE	SD( $Y$ )	SDE	SE(SDE)	Classification
<i>Panel A: Pooled (Callaway-Sant’Anna)</i>						
Education share	-0.685	(0.959)	6.06	-0.113	(0.158)	Moderate negative
Social security share	-0.173	(0.697)	4.82	-0.036	(0.144)	Small negative
Administration share	-0.406	(0.501)	2.40	-0.169	(0.208)	Large negative
Transport share	0.393	(1.759)	6.97	0.056	(0.252)	Moderate positive
<i>Panel B: Hard rules only (TWFE)</i>						
Education share (hard rules)	-0.783	(0.756)	6.61	-0.118	(0.114)	Moderate negative
Social security share (hard rules)	-0.112	(0.570)	4.63	-0.024	(0.123)	Small negative
Administration share (hard rules)	-0.004	(0.316)	1.60	-0.002	(0.198)	Null
Transport share (hard rules)	1.165	(1.147)	6.71	0.174	(0.171)	Large positive

*Notes:* **Country:** Switzerland. **Research question:** Do cantonal debt brake adoptions reshape the functional composition of public spending, shifting expenditure from investment-intensive categories toward current consumption? **Policy mechanism:** Cantonal fiscal rules (Schuldenbremsen) impose legally binding balanced-budget requirements or expenditure growth limits, creating a structural constraint on annual budget deficits that forces reallocation across spending categories. **Outcome definition:** Expenditure share (%) of each functional category in total cantonal spending, computed from Swiss Federal Finance Administration standardized accounts. **Treatment:** Binary—canton-year observations after debt brake adoption vs. before/never-treated. **Data:** Swiss Federal Finance Administration (EFV), cantonal accounts by function, 1990–2024, canton-year level, 24 cantons (excl. pre-1990 adopters), 840 observations per function. **Method:** Callaway-Sant’Anna (2021) staggered DiD with not-yet-treated comparison group (Panel A); TWFE with canton and year fixed effects for hard-rule subsample (Panel B); SEs clustered at canton level. **Sample:** Swiss cantons adopting debt brakes 1994–2014 (20 treated) and 4 never-treated cantons; pre-1990 adopters excluded from main analysis but included in sensitivity checks.  $SDE = \hat{\beta}/SD(Y)$  where  $SD(Y)$  is the pre-treatment standard deviation. Classification refers to magnitude, not statistical significance: Large ( $|SDE| > 0.15$ ), Moderate (0.05–0.15), Small (0.005–0.05), Null ( $< 0.005$ ).

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