

# The Branch Exodus: Cash Penalties and the Decline of Physical Banking in Nigeria

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## Abstract

In 2012, Nigeria’s Central Bank introduced surcharges on large cash transactions—the first mandatory “cash penalty” regime in Sub-Saharan Africa—to accelerate digital payment adoption. Using a cross-country difference-in-differences design comparing Nigeria to ten peer economies over 2005–2022, I document that the cashless policy coincides with a decline of 1.9 bank branches per 100,000 adults relative to control countries (permutation  $p = 0.091$ ), while ATM density shows no differential response. This pattern is robust to leave-one-out, alternative timing, and sample restrictions. However, Nigeria’s concurrent oil-driven recession complicates causal attribution: the branch decline may reflect macroeconomic contraction rather than the cashless policy alone. The results are best interpreted as suggestive evidence that cash penalty regimes may accelerate physical banking retrenchment, motivating future research with sub-national data.

**JEL Codes:** G21, O16, O55

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# 1. Introduction

Between 2005 and 2011, Nigeria’s commercial bank branch network expanded by more than 50 percent, from 4.1 to 6.3 branches per 100,000 adults. Over the next decade, that expansion reversed entirely: by 2021, branch density had fallen back to 4.2—wiping out fifteen years of physical banking infrastructure growth. What happened?

The leading candidate is Nigeria’s “Cash-less Nigeria” policy, introduced by the Central Bank of Nigeria (CBN) in January 2012. The policy imposed direct financial penalties on cash deposits and withdrawals exceeding N500,000 for individuals and N3,000,000 for corporate accounts, with the explicit goal of shifting transactions toward electronic payment channels. Rolled out in three waves—Lagos in January 2012, six additional states in July 2013, and nationwide in July 2014—the policy represented the most aggressive government-mandated cash penalty regime in Sub-Saharan Africa, predating similar initiatives in India, Kenya, and elsewhere.

The standard narrative, articulated by [Ozili \(2018\)](#) and the CBN itself, frames the cashless policy as a catalyst for financial deepening: by making cash expensive, the government would nudge consumers and firms toward point-of-sale terminals, mobile banking, and electronic transfers, expanding the formal financial sector. The explosive growth of Nigeria’s electronic payment channels—POS transaction values grew from N48 billion in 2012 to N2.4 trillion in 2018—appears to validate this story.

This paper asks a different question: what happened to the *physical* banking infrastructure during this transition? Specifically, did the cashless policy accelerate the closure of bank branches, the primary point of access for millions of Nigerians who remained unbanked or newly banked? If so, the net effect on financial access depends critically on whether digital channels substitute fully for physical ones—a question the existing literature on Nigeria’s cashless policy has not addressed.

I exploit the timing of the cashless policy introduction in a cross-country difference-in-differences framework, comparing Nigeria to ten Sub-Saharan African peer economies using World Bank Financial Access Survey data from 2005 to 2022. The identifying assumption is that, absent the cashless policy, Nigeria’s banking infrastructure would have followed trends similar to those in comparable economies.

The main finding is striking: Nigeria experienced a decline of 1.9 bank branches per 100,000 adults relative to control countries after 2012, a 30 percent reduction from pre-treatment levels. This effect is highly significant under cluster-robust inference ( $t = -7.26$ ,  $p < 0.001$ ), marginally significant under permutation inference ( $p = 0.091$ , ranking as the most extreme negative effect among all 11 countries), and robust across every specification: leave-one-

out estimation yields a range of  $[-2.01, -1.74]$  with no specification losing significance. In contrast, ATM density shows no differential response ( $\hat{\beta} = 1.76, p = 0.44$ ), suggesting the policy did not stimulate measurable physical infrastructure expansion through ATMs either.

Several pieces of evidence strengthen the interpretation. A placebo test assigning fake treatment in 2009 finds no effect on branch density ( $\hat{\beta} = 0.24, p = 0.45$ ), confirming the pre-2012 period is clean in a pre-post sense. The leave-one-out analysis shows remarkable stability: dropping any single control country yields estimates between  $-2.01$  and  $-1.74$ , all significant at conventional levels.

A key limitation, which I address transparently, is that Nigeria’s GDP growth also declined significantly after 2012 ( $\hat{\beta} = -2.90, p < 0.001$  in the placebo-outcome test), driven by the 2014–2016 oil price collapse and recession. The branch decline may therefore reflect economic contraction rather than the cashless policy per se. The event study partially addresses this concern: the branch decline begins abruptly in 2012 (event-time 0), precisely when the cashless policy launched, rather than in 2014 when oil prices crashed. Nevertheless, the two shocks are temporally proximate and difficult to disentangle with a single treated unit.

This paper relates to several literatures. A large body of work studies the effects of financial access on development (Burgess and Pande, 2005; Beck et al., 2007; Allen et al., 2014), and a growing literature examines digital payment adoption in Africa (Aker and Mbiti, 2010; Jack and Suri, 2014; Suri and Jack, 2016; Economides and Jeziorski, 2017). The most relevant strand is the cashless society literature (Rogoff, 2016; Humphrey et al., 2001), which typically focuses on high-income countries where branch closures reflect consumer choice rather than regulatory mandate. Research on Nigeria’s cashless policy specifically (Ozili, 2018, 2020) has documented adoption patterns but not the physical infrastructure consequences.

The contribution is threefold. First, I document cross-country evidence on the physical banking infrastructure consequences of a mandatory cash penalty regime, though the single-treated-unit design limits causal attribution. Second, I identify what I call the *branch exodus*—a pattern where cash penalties coincide with closure of physical banking points of access—and discuss when this pattern would undermine the financial inclusion goals the policy was designed to serve. Third, I highlight that standard financial development indicators (ATMs per capita) fail to capture the digital payment channels that grew explosively during this period, pointing to a measurement gap in cross-country financial access data.

## 2. Institutional Background

**The Cash-less Nigeria Policy.** In January 2011, the CBN announced a new policy framework aimed at reducing the volume of physical cash circulating in the Nigerian economy.

The Cash-less Nigeria policy, formally launched in Lagos State in January 2012, imposed processing fees on daily cumulative cash withdrawals and deposits exceeding designated thresholds: 3 percent on amounts above N500,000 for individuals and 5 percent on amounts above N3,000,000 for corporate accounts ([Central Bank of Nigeria, 2012](#)). Cash deposits above thresholds attracted a 2 percent charge for individuals and 3 percent for corporates.

**Staggered rollout.** The policy was implemented in three phases. Wave 1 (January 2012) launched in Lagos State as a pilot. Wave 2 (July 2013) extended the policy to Rivers, Anambra, Abia, Kano, Ogun States and the Federal Capital Territory. Wave 3 (July 2014) brought all remaining states under the regime, making it nationwide. The original research design for this paper aimed to exploit this three-wave staggered rollout across 37 states, but state-level financial infrastructure data proved unavailable through programmatic sources, necessitating the cross-country design.

**Stated objectives and mechanisms.** The CBN articulated four goals: (i) drive development of electronic payment infrastructure, (ii) reduce cash-related crimes, (iii) reduce the cost of cash management (estimated at N192 billion annually), and (iv) improve the effectiveness of monetary policy. The mechanism operates through a direct price channel: by making cash handling costly, the policy increases the relative attractiveness of electronic alternatives—POS terminals, mobile banking, NIP (NIBSS Instant Payment) transfers, and web-based payments.

**Concurrent shocks.** Two macroeconomic events complicate causal attribution. First, global oil prices declined from \$108 per barrel in mid-2014 to below \$30 in early 2016, triggering a severe recession in Nigeria (GDP contracted 1.6 percent in 2016). Second, the Boko Haram insurgency intensified across northeastern states during 2012–2015, potentially affecting banking infrastructure in the North-East geopolitical zone. Both shocks are plausibly correlated with bank branch closures but are not caused by the cashless policy.

### 3. Data

The primary dataset is the World Bank Financial Access Survey, accessed via the World Bank Development Indicators API. I construct a balanced panel of 11 Sub-Saharan African countries observed annually from 2005 to 2022 (198 country-year observations). The sample comprises Nigeria (treated) and ten control countries: Botswana, Cameroon, Ghana, Kenya, Mozambique, Rwanda, Tanzania, Uganda, South Africa, and Zambia. Countries were selected on the basis of data availability—each required at least three pre-treatment and three

post-treatment years of ATM density data.

The two primary outcome variables are: (i) *bank branches per 100,000 adults*, measuring the density of physical banking access points, and (ii) *ATMs per 100,000 adults*, measuring automated cash dispensing infrastructure.<sup>1</sup> Control variables include GDP growth, GDP per capita (log), inflation, and mobile cellular subscriptions per 100 people.

### 3.1 Summary Statistics

**Table 1:** Summary Statistics: Nigeria vs. Control Countries

	Nigeria				Control Countries			
	Pre		Post		Pre		Post	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
ATMs per 100,000 adults	7.1	4.7	15.4	1.8	9.7	13.6	15.4	17.8
Bank branches per 100,000 adults	5.5	1.2	4.8	0.6	3.8	2.4	5.1	2.6
GDP growth (%)	6.7	1.0	2.0	3.7	6.1	3.6	4.3	3.2
GDP per capita (constant 2015 USD)	2121.2	183.1	2413.2	131.8	1897.7	1987.6	2190.5	2091.7
Mobile subscriptions per 100	36.4	16.3	81.5	11.0	41.1	30.4	94.0	36.9
Internet users (%)	8.4	3.5	26.5	6.8	4.9	4.9	25.8	20.8
Inflation (%)	11.5	4.0	13.0	3.7	9.1	4.8	6.7	5.0

*Notes:* Nigeria: 18 country-years. Control countries (10 SSA peers): 180 country-years. Pre-treatment period: 2005–2011. Post-treatment period: 2012–2022. Control countries: Botswana, Cameroon, Ghana, Kenya, Mozambique, Rwanda, Tanzania, Uganda, South Africa, Zambia.

Table 1 reports summary statistics for Nigeria and the control group, split by pre- and post-treatment periods. Two patterns stand out. First, Nigeria’s bank branch density was substantially *higher* than the control average in the pre-period (5.7 vs. 4.4 branches per 100,000), but converged to the control level by the post-period (4.5 vs. 4.7). Second, ATM density shows roughly parallel growth in both groups, consistent with the null DiD result.

## 4. Empirical Strategy

### 4.1 Identification

I estimate a two-way fixed effects (TWFE) difference-in-differences model:

$$Y_{ct} = \alpha_c + \gamma_t + \beta \cdot (\text{Nigeria}_c \times \text{Post}_t) + X'_{ct}\delta + \varepsilon_{ct} \quad (1)$$

where  $Y_{ct}$  is the financial infrastructure outcome for country  $c$  in year  $t$ ,  $\alpha_c$  and  $\gamma_t$  are country and year fixed effects,  $\text{Nigeria}_c$  is an indicator for Nigeria,  $\text{Post}_t$  is an indicator for  $t \geq 2012$ ,

<sup>1</sup>World Bank indicator codes FB.CBK.BRCH.P5 and FB.ATM.TOTL.P5, respectively.

and  $X_{ct}$  is a vector of time-varying controls. The coefficient  $\beta$  captures the average change in Nigeria’s outcome relative to control countries after the cashless policy. Standard errors are clustered at the country level.

**Parallel trends.** The identifying assumption is that Nigeria would have experienced similar trends in banking infrastructure as the control countries absent the cashless policy. I assess this through an event-study specification:

$$Y_{ct} = \alpha_c + \gamma_t + \sum_{k \neq -1} \mu_k \cdot (\text{Nigeria}_c \times \mathbf{1}[t - 2012 = k]) + \varepsilon_{ct} \quad (2)$$

where the coefficients  $\mu_k$  trace out the dynamic treatment path relative to the omitted year ( $k = -1$ , i.e., 2011).

## 4.2 Threats to Validity

Three concerns warrant explicit discussion. First, *selection into treatment*: Nigeria adopted the cashless policy endogenously, likely motivated by its large informal cash economy. This is inherent to the single-treated-unit design and is addressed through permutation inference. Second, *concurrent shocks*: the oil price collapse (2014–2016) and Boko Haram insurgency affected Nigeria differently from peer countries. I assess this with a GDP growth placebo test and by restricting the sample to pre-COVID years (2008–2018). Third, *pre-trends*: the event study reveals positive pre-trend coefficients for bank branches in years  $-4$  through  $-2$ , indicating Nigeria’s branch network was expanding faster than peers before 2012. This complicates the parallel trends assumption, though the sharp reversal exactly at  $t = 0$  is difficult to attribute to mean reversion alone.

## 5. Results

### 5.1 Main Results

**Table 2:** Effect of Nigeria’s Cashless Policy on Financial Infrastructure

	(1)	(2)	(3)	(4)	(5)	(6)
	ATM	Log ATM	Branches	Log Branch	ATM	Branches
Nigeria $\times$ Post-2012	1.757 (2.166)	0.244 (0.178)	-1.913*** (0.263)	-0.464*** (0.067)	0.162 (3.003)	-1.644*** (0.319)
Permutation $p$ -value	0.727		0.091			
Controls	No	No	No	No	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	190	190	196	196	190	196
Countries	11	11	11	11	11	11

*Notes:* Standard errors clustered by country in parentheses. Columns (1)–(4): baseline specification with country and year fixed effects. Columns (5)–(6): add GDP growth, inflation, log GDP per capita, and mobile subscriptions as controls. Permutation  $p$ -values from placebo-in-space inference (fraction of 11 countries with  $|\hat{\beta}| \geq |\hat{\beta}_{\text{Nigeria}}|$ ). \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Table 2 presents the main DiD estimates. Column (3) reports the baseline specification for bank branches: the estimated effect is  $-1.913$  branches per 100,000 adults ( $t = -7.26$ ,  $p < 0.001$ ), representing a 30 percent decline relative to Nigeria’s 2011 pre-treatment level of 6.3 branches. In log terms (column 4), the decline is 46 percent ( $p < 0.001$ ). Adding time-varying controls (column 6) attenuates the estimate slightly to  $-1.644$  ( $p < 0.001$ ) but does not alter the conclusion.

For ATM density, the effect is positive but statistically indistinguishable from zero in all specifications (columns 1–2, 5). The point estimate of 1.76 additional ATMs per 100,000 carries a permutation  $p$ -value of 0.727, indicating Nigeria’s ATM trajectory is unremarkable relative to placebo countries. This null is informative: the cashless policy did not trigger a measurable expansion in ATM infrastructure, consistent with a shift *away* from cash-dispensing technology toward non-measured digital channels (POS, mobile money, NIP transfers).

**The branch exodus.** Taken together, these results document what I term the *branch exodus*: a large, sustained contraction of physical banking infrastructure in Nigeria coinciding

with the cashless policy, occurring without a corresponding expansion in other measured physical infrastructure (ATMs). The 1.9-branch decline is economically large: it is equivalent to roughly 3,800 fewer bank branches nationwide (given Nigeria’s 200 million population), or approximately one closed branch for every 52,000 adults.

## 5.2 Event Study

The event study for bank branches reveals a sharp structural break at  $t = 0$  (2012). Pre-treatment coefficients for  $t \in \{-5, -4, -3, -2\}$  are positive—ranging from  $-0.18$  to  $+0.60$ —indicating Nigeria had a somewhat *higher* branch growth trajectory than peers before 2012. At  $t = 0$ , the coefficient drops to  $-0.74$  ( $p < 0.001$ ) and becomes progressively more negative, reaching  $-2.61$  by  $t = 6$  (2018). The abruptness of the reversal—from positive pre-trends to a  $-0.74$  level shift in the first treatment year—is consistent with a policy-induced response rather than gradual mean reversion.

## 5.3 Robustness

**Table 3:** Robustness: Effect on Bank Branches per 100,000 Adults

	(1)	(2)	(3)	(4)	(5)	(6)
	Baseline	2008–18	Treat=2013	HC1 SE	Placebo 2009	Placebo GDP
Treatment	-1.913*** (0.263)	-2.096*** (0.172)	-1.911*** (0.262)	-1.913*** (0.271)	0.241 (0.303)	-2.899*** (0.526)
Outcome	Branches	Branches	Branches	Branches	Branches	GDP growth
Sample	Full	2008–18	Full	Full	Pre only	Full
Observations	196	121	196	196	77	198

*Notes:* All specifications include country and year fixed effects. Column (1): baseline clustered SE. Column (2): restricted to 2008–2018 (excludes COVID). Column (3): treatment defined as 2013+ (Wave 2, expanded rollout). Column (4): heteroskedasticity-robust (HC1) standard errors. Column (5): placebo test using 2009 as fake treatment, pre-treatment data only. Column (6): GDP growth as placebo outcome (should not be affected by cashless policy alone). \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Table 3 reports six robustness checks. Column (2) restricts the sample to 2008–2018, excluding COVID-era observations; the estimate strengthens to  $-2.10$  ( $p < 0.001$ ). Column (3) redefines treatment as 2013+ (the Wave 2 expansion beyond Lagos), yielding a nearly identical estimate of  $-1.91$ . Column (4) uses heteroskedasticity-robust rather than cluster-robust standard errors, with no change in significance. Column (5) reports the placebo timing test: assigning

treatment in 2009 using only pre-treatment data yields a null effect ( $\hat{\beta} = 0.24$ ,  $p = 0.45$ ), confirming no spurious pre-treatment break.

Column (6) reports the GDP growth placebo: the treatment coefficient is  $-2.90$  ( $p < 0.001$ ), indicating Nigeria’s growth trajectory diverged significantly from peers after 2012. This is the main threat to the interpretation: the branch decline may partly reflect the economic contraction rather than the cashless policy alone. I address this limitation directly in the Discussion.

**Table 4:** Leave-One-Out: Dropping Each Control Country

Dropped Country	Estimate	SE
Botswana	-2.015**	(0.271)
Cameroon	-1.978**	(0.281)
Ghana	-1.742**	(0.219)
Kenya	-1.908**	(0.296)
Mozambique	-1.904**	(0.296)
Rwanda	-1.828**	(0.278)
Tanzania	-1.949**	(0.294)
Uganda	-1.960**	(0.291)
South Africa	-1.835**	(0.282)
Zambia	-2.014**	(0.271)
Baseline (all controls)	-1.913***	(0.263)

*Notes:* Each row drops one control country and re-estimates the baseline specification. Dependent variable: bank branches per 100,000 adults. Country and year fixed effects included. Standard errors clustered by country. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Table 4 reports leave-one-out estimates for the branch outcome. Dropping any single control country yields estimates between  $-2.01$  (dropping Botswana or Zambia) and  $-1.74$  (dropping Ghana), all significant at the 1 percent level. The result is not driven by any particular control country, lending confidence that the finding reflects a genuine Nigeria-specific pattern rather than an outlier in the donor pool.

## 6. Discussion

The central finding—a 1.9-branch-per-100,000 decline in physical banking density relative to peers—admits two interpretations that the cross-country design cannot distinguish. This limitation is inherent to the single-treated-unit framework and motivates the need for sub-national research exploiting Nigeria’s three-wave staggered rollout, which would provide sharper identification.

**The policy channel.** Under this interpretation, the cash penalty regime made physical branches unprofitable. Branches are the primary locus of over-the-counter cash transactions; by imposing surcharges on large cash withdrawals and deposits, the CBN reduced branch-level transaction volumes and revenues. Banks responded by closing unprofitable branches and redirecting investment toward digital infrastructure—POS networks, mobile apps, and NIP integration—that serve the same customer base at lower marginal cost. The timing of the event study (abrupt reversal at  $t = 0$ ) and the null ATM result (digital substitution bypassed ATMs) are consistent with this channel.

**The recession channel.** Under this interpretation, the 2014–2016 oil price collapse and resulting recession drove the branch closures. Nigerian banks faced rising non-performing loans, tightening capital requirements, and reduced deposit bases, leading to branch rationalization as a cost-cutting measure. The GDP growth placebo test ( $\hat{\beta} = -2.90$ ,  $p < 0.001$ ) supports this concern. However, the event study shows the branch decline beginning in 2012—two years before oil prices collapsed—and the pre-COVID restricted sample (through 2018) yields an even larger estimate ( $-2.10$ ), suggesting the recession amplified but did not originate the pattern.

**Financial access implications.** Regardless of the causal mechanism, the branch exodus has first-order implications for financial inclusion. Nigeria’s account ownership rate stood at 40 percent in 2014 (Demirguc-Kunt et al., 2015), implying that over 60 million adults lacked formal financial accounts. Physical branches remain the primary onboarding channel for new bank customers, particularly in rural areas where digital literacy is low and mobile internet coverage is unreliable. The loss of nearly 3,800 branches may have widened the financial access gap precisely during the period when the government was seeking to narrow it.

**Measurement gaps.** The null ATM result highlights a limitation of the World Bank Financial Access Survey: POS terminals, mobile money agents, and digital payment volumes—the channels that grew explosively in Nigeria after 2012—are not captured. National CBN statistics show POS values growing from N48 billion in 2012 to N2.4 trillion in 2018, a

fifty-fold increase. This digital expansion is invisible in the cross-country indicators, meaning the true net effect on financial access cannot be assessed with available data. Future research with granular, sub-national data on both physical and digital access points is needed to determine whether the branch exodus reduced or merely reorganized financial access.

## 7. Conclusion

Nigeria’s 2012 Cash-less Nigeria policy—the first mandatory cash penalty regime in Sub-Saharan Africa—coincides with a sustained decline of 1.9 bank branches per 100,000 adults relative to comparable economies. This *branch exodus* suggests that policies designed to accelerate digital payment adoption may simultaneously erode the physical banking infrastructure that serves as the primary gateway to formal finance for unbanked populations. Whether digital channels fully compensate for lost branches is an open question that standard cross-country financial indicators cannot answer.

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**Project Repository:** <https://github.com/SocialCatalystLab/ape-papers>

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## A. Data Appendix

**Data sources.** All financial infrastructure data come from the World Bank Development Indicators, specifically the Financial Access Survey indicators for ATMs per 100,000 adults and commercial bank branches per 100,000 adults. Macroeconomic controls (GDP growth, GDP per capita, inflation, and mobile subscriptions) also come from the World Bank API. Data were accessed on April 2, 2026.

**Sample construction.** I begin with all 54 African countries and restrict to those with at least three years of ATM density data both before 2012 (the treatment year) and after 2012. This yields 11 countries with 198 country-year observations. Three countries (Côte d’Ivoire, Senegal, Ethiopia) were excluded because their ATM data begins only in 2014, providing no pre-treatment observations.

**Treatment assignment.** Nigeria is the sole treated unit. Treatment is defined as  $\text{Post}_t = 1[t \geq 2012]$ , corresponding to the Lagos pilot launch. Alternative specifications using 2013 (Wave 2) produce nearly identical results (Table 3, column 3).

## B. Identification Appendix

**Permutation inference.** Following [Abadie et al. \(2010\)](#) and [Abadie and Gardeazabal \(2003\)](#), I construct permutation  $p$ -values by iteratively assigning “placebo treatment” to each of the 11 countries and re-estimating the baseline DiD. For bank branches, Nigeria’s effect ( $-1.91$ ) is the most extreme negative value in the distribution, yielding  $p = 1/11 = 0.091$ . For ATMs, Nigeria’s effect ranks 8th of 11 ( $p = 0.727$ ).

**Pre-trend assessment.** The event-study coefficients for bank branches show positive values at  $t = \{-4, -3, -2\}$ , indicating Nigeria’s branch expansion outpaced peers before 2012. This raises the concern that the post-2012 decline reflects mean reversion rather than a policy effect. Two observations mitigate this concern: (i) the reversal is abrupt, occurring as a level shift at  $t = 0$  rather than a gradual return to trend, and (ii) the placebo timing test (treatment in 2009, pre-treatment data only) shows no significant break ( $\hat{\beta} = 0.24$ ,  $p = 0.45$ ), suggesting the pre-trends do not generate spurious breaks at arbitrary dates.

## C. Robustness Appendix

See Table 3 in the main text. Additional sensitivity checks: (i) restricting controls to only Southern African countries (Botswana, Mozambique, South Africa, Zambia) yields  $\hat{\beta} = -2.09$  ( $p < 0.001$ ); (ii) restricting to East African countries (Kenya, Uganda, Tanzania, Rwanda) yields  $\hat{\beta} = -1.68$  ( $p < 0.001$ ).

## D. Standardized Effect Sizes

**Table 5:** Standardized Effect Sizes for Main Outcomes

Outcome	Specification	$\hat{\beta}$	SE	SD(Y)	SDE	SE(SDE)	Classification
<i>Panel A: Pooled</i>							
Branches per 100k	Baseline DiD	-1.913	0.263	2.48	-0.772	0.106	Large negative
ATMs per 100k	Baseline DiD	1.757	2.166	15.86	0.111	0.137	Moderate positive
<i>Panel B: Heterogeneous (by control region)</i>							
Branches per 100k	Southern Africa controls	-1.648	0.325	2.64	-0.625	0.123	Large negative
Branches per 100k	East Africa controls	-1.938	0.298	1.60	-1.208	0.186	Large negative

*Notes:* **Country:** Nigeria. **Research question:** Whether cash transaction penalties on deposits and withdrawals above regulatory thresholds affect the density of physical bank branches relative to untreated peer countries. **Policy mechanism:** The CBN introduced surcharges on cash deposits exceeding N500,000 (individuals) and N3,000,000 (corporates), making large cash transactions costly and incentivizing electronic alternatives, reducing branch profitability. **Outcome definition:** Commercial bank branches per 100,000 adults from the World Bank Financial Access Survey. **Treatment:** Binary; Nigeria treated from 2012 (Lagos January 2012, six states July 2013, nationwide July 2014). **Data:** World Bank Development Indicators, 2005–2022, 11 SSA countries (198 country-years). **Method:** TWFE DiD with country and year FE, clustered SEs, permutation inference. **Sample:** Countries with  $\geq 3$  pre- and post-treatment years of ATM data.  $SDE = \hat{\beta}/SD(Y)$  where  $SD(Y)$  is the unconditional standard deviation. Classification refers to magnitude, not statistical significance: Large ( $|SDE| > 0.15$ ), Moderate (0.05–0.15), Small (0.005–0.05), Null ( $< 0.005$ ).