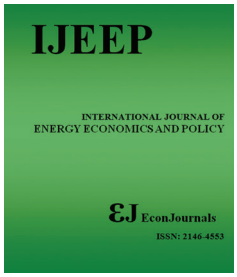

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GCC's Post-Oil Transition: Rising Profitability Advantage of Non-Energy Sectors

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ABSTRACT

We examine the asymmetric effects of national economic diversification policies on firm-level profitability in the Gulf Cooperation Council (GCC), addressing a critical gap in the microeconomic literature on the region's transition from hydrocarbons. Using a dynamic panel dataset of 444 firms across all six GCC countries from 2012 to 2024, we employ a Difference-in-Differences (DiD) approach complemented by System Generalized Method of Moments estimation to establish causal relationships while rigorously addressing endogeneity concerns. The results reveal that diversification policies significantly boosted profitability in non-oil firms, with policy milestones increasing asset-based returns by 1.8% and equity-based returns by 2.5%, while government subsidies amplified these effects by an additional 4.2% and 6.2%, respectively. These impacts intensified post-2019, with targeted subsidies driving profitability gains of 8.2% on assets and 12.3% on equity. Conversely, oil-dependent firms showed no statistically significant response to policy interventions. The findings underscore the efficacy of targeted fiscal incentives and selective policy support in driving successful economic diversification, offering valuable insights for policymakers in resource-rich economies seeking to engineer sustainable post-oil transitions through precise firm-level interventions.

Keywords: Economic Diversification, Firm Profitability, Gulf Cooperation Council, Energy Transition
JEL Classification: O13, G30, L52

1. INTRODUCTION

Facing an existential economic imperative, the Gulf Cooperation Council (GCC) states are decisively shifting away from hydrocarbon dependence. Driven by oil price volatility, finite reserves, and global decarbonization, this transition is redefining firm profitability across the region. National diversification strategies—such as Saudi Vision 2030 and UAE Vision 2071—are creating growth opportunities in non-oil sectors like technology, tourism, and renewables, while simultaneously challenging the profitability models of traditional oil-reliant industries. Consequently, profitability trajectories are diverging: firms aligned with new sectors benefit from state investment and regulatory reforms, whereas those tied to the legacy hydrocarbon economy face mounting pressure on margins and long-term viability. This structural transformation is reshaping the regional business landscape and will determine future corporate and regional prosperity.

Despite this macroeconomic backdrop, critical gaps persist in understanding the microeconomic consequences of diversification for firm profitability. While existing literature extensively explores the macroeconomic imperatives and sectoral strategies for economic diversification in resource-dependent economies, particularly within the GCC context (Callen et al., 2014; Ben Hassen, 2022; Ali and Abdalla, 2025; Sweidan, 2025), critical gaps persist in understanding the microeconomic consequences for firm profitability. Studies confirm the vulnerability of oil-

exporting nations to price volatility (Fattouh et al., 2019; Murshed and Tanha, 2021) and emphasize the need for structural reforms to facilitate energy transitions (Karanfil and Omgba, 2023). However, empirical evidence directly linking national diversification policies to firm-level financial performance and profitability outcomes remains notably scarce and fragmented.

Although research identifies broad implementation challenges like institutional path dependency (Brunelle and Spigel, 2017; Astudillo Estevez, 2021) and financing hurdles (Atalla and D'Errico, 2019; Alkathery et al., 2023), there is a pronounced deficit in studies examining how these diversification efforts translate into concrete impacts on corporate earnings, margins, and shareholder value across the evolving non-oil economy. Existing firm-level analyses are often constrained, focusing narrowly on the implications of oil prices on profitability (Bugshan et al., 2023; Saif-Alyousfi et al., 2018) or sector-specific indicators in single countries (Alshubiri et al., 2020), and lacking comprehensive cross-sectoral and cross-country comparative assessments of profitability drivers within the GCC's diversification landscape. Furthermore, studies examining diversification outcomes frequently rely on aggregate data (Ali and Hussein, 2024) or fail to adequately address endogeneity concerns when assessing the causal links between policy interventions and corporate profitability, leaving a significant void in understanding how the transition manifests in actual corporate financial resilience and sustainable profit generation.

This study directly addresses these gaps by providing an empirical analysis testing the central hypothesis that national diversification policies asymmetrically boost profitability in non-oil GCC firms, while having minimal effects on oil-dependent firms. We employ a dynamic fixed effects panel dataset encompassing 444 firms across all six GCC countries from 2012 to 2024, utilizing a DiD approach complemented by the System Generalized Method of Moments (GMM) estimator to establish causal links while addressing endogeneity concerns rigorously. Our analysis demonstrates how policy milestones trigger structural breaks in profitability trajectories, with government support and non-oil investment intensity serving as critical transmission channels that amplify returns for compliant firms. By contrasting 262 non-oil firms against 182 oil-dependent entities across five targeted sectors, we quantify how capital intensity, sectoral dynamics, and policy interaction drive differential profitability outcomes.

The results demonstrate that GCC diversification policies generated clear profitability gains for non-oil firms while leaving oil-dependent firms unaffected. For non-oil companies, policy milestones raised profitability by around 1.8% in assets-based returns and 2.5% in equity-based returns, with government subsidies amplifying these effects substantially—adding a further 4.2% and 6.2% growth, respectively. The impact intensified after 2019, when targeted subsidies boosted profitability to gains of 8.2% on assets and 12.3% on equity, reflecting improved policy design and implementation. By contrast, oil-dependent firms showed no significant response: coefficients for subsidies and investment were near zero, with changes of −0.8% to −1.1%, all statistically insignificant. These results may confirm that fiscal incentives were deliberately directed toward non-oil sectors, avoiding the misallocation risks of propping up hydrocarbon firms (Barman and Mahakud, 2025).

The remainder of the paper is structured as follows: Section 2 reviews the literature on GCC economic diversification, firm profitability dynamics, and transition challenges. Section 3 describes the data and variable construction. Section 4 outlines the empirical methodology and presents the results. Section 5 discusses policy implications for enhancing firm profitability during economic transition. Section 6 concludes.

2. LITERATURE REVIEW

The theoretical underpinnings of firm profitability during economic transition are rooted in the dynamics of the resource curse and institutional path dependency. Foundational models posit that hydrocarbon wealth creates structural rigidities—including distorted factor markets, rent-seeking behaviors, and underdeveloped institutions—that hinder diversification and suppress the competitiveness of the non-oil sector (Callen et al., 2014; Sweidan, 2025). The imperative for transition is further driven by exposure to oil price volatility (Fattouh et al., 2019; Murshed and Tanha, 2021), finite reserves, and global decarbonization pressures. Theoretical frameworks emphasize that institutional path dependencies, entrenched interests, and regulatory legacies optimized for extractive industries create significant barriers to reallocating capital and talent toward new sectors (Astudillo Estevez, 2021; Brunelle and Spigel, 2017). The core proposition is that successful policy-driven transitions should, over time, enhance the profitability potential of non-oil firms by creating new markets and improving efficiency, albeit through disruptive breaks in established profitability trajectories.

Empirically, however, the microeconomic impacts of these transitions remain critically underexplored. While macroeconomic diversification imperatives and sectoral strategies—particularly in renewables—are well-documented (Callen et al., 2014; Karanfil and Omgba, 2023), studies directly linking national policies to firm-level profitability are scarce and fragmented. Existing research often focuses on the direct effects of oil prices on firm performance (Bugshan et al., 2023; Saif-Alyousfi et al., 2018) or offers single-country/single-sector analyses (Alshubiri et al., 2020), thereby lacking cross-sectoral and comparative perspectives essential for understanding region-wide transitions. Moreover, many studies rely on aggregate data (Ali and Hussein, 2024) or fail to address endogeneity concerns, leaving causal inference unresolved.

A significant methodological gap exists in establishing causal links between policy interventions and firm performance. Many studies employ descriptive or correlational approaches, overlooking robust econometric techniques needed for dynamic panel data and causal identification. Variables often lack granularity, omitting measures of policy intensity, sectoral dynamics, or firm-specific adjustments during transition. The absence of comparative cross-country frameworks within the GCC is particularly notable given shared goals but divergent implementation strategies (Ben Hassen, 2022).

Consequently, a profound disconnect persists: While the need for transition is empirically established, there remains scant evidence on how diversification policies asymmetrically affect oil versus non-oil firms' profitability. Critical questions regarding profitability breaks, differential resilience, and firm-level transmission mechanisms remain unanswered. This study addresses these gaps by examining the micro-foundations of GCC economic diversification through a comparative firm-level lens, offering causal evidence on how policy interventions reshape profitability dynamics across sectors.

3. DATA AND VARIABLES ANALYSIS

Our study empirically traces the asymmetric impact of GCC economic transition policies on firm-level profitability, as illustrated in the accompanying diagram (Figure 1). Employing a DiD design, we contrast the pathways of Non-Oil Firms (treatment group) and Oil-Dependent Firms (control group) following national policy launches. The results demonstrate that policy-driven increased investment and government subsidies significantly boost profitability growth for non-oil firms. Conversely, oil-dependent firms experience No Change in support and thus show no significant profitability response. This stark divergence is expected to provide empirical evidence for a statistically substantial asymmetric impact, demonstrating that diversification policies can selectively rewire financial incentives toward the non-oil economy.

Our analysis centers on two dependent variables measuring firm profitability growth: the annual change in return on assets (ΔROA) and return on equity (ΔROE). ΔROA captures shifts in operational efficiency and asset utilization, while ΔROE reflects evolving shareholder returns as financial structures adapt to economic transition. These metrics allow us to assess how policy interventions alter fundamental profit drivers directly. Key explanatory variables include a Policy Milestone Dummy (DUM) identifying major diversification launches, and a continuous Policy Progress Index (IND) tracking annual advancements in fiscal, regulatory, and human capital dimensions. We incorporate firm-level measures, including non-oil investment intensity (INV), which measures capital reallocation to priority sectors, and Government Support (GOV_SUP), which quantifies subsidies and fiscal incentives as a percentage of revenue. A sectoral dynamics proxy (SECTOR) links firm performance to policy-driven sectoral trends. Critical interaction terms (e.g., DUM × GOV_SUP, IND × INV) test whether policy impacts depend on firm engagement, helping address endogeneity concerns by revealing micro-level transmission channels. The empirical specification controls for firm-specific factors (size, leverage, sales growth) and macroeconomic conditions (GDP growth, inflation, oil volatility, exchange rates). We employ Firm and Year Fixed Effects to account for unobserved heterogeneity and global shocks, with optional country-sector fixed effects for structural differences. This comprehensive approach ensures robust identification of policy effects on profitability during the GCC's economic transition. The definitions of all variables used in this empirical examination are reported in Table 1.

We divide our global sample of 444 firms across all six GCC countries into two groups, classifying firms based on their primary revenue source (those with >75% non-oil revenue versus oil-dependent firms), resulting in 262 non-oil firms and 182 oil-dependent firms, to address the core question of asymmetric impacts. This comprehensive sample spans the 2012-2024 period, covering five key non-oil sectors targeted by national diversification policies—manufacturing, renewables, technology, tourism, and logistics—alongside traditional hydrocarbon activities. The resulting firm-year observations (5,328 for non-oil firms and 3,528 for oil-dependent firms) provide a robust foundation for analyzing differential policy impacts. This classification enables the critical comparison of profitability paths between legacy and emerging sectors, filling a significant void identified in literature reviews of GCC diversification, which lack such firm-level comparative analysis (Ben Hassen, 2022; Callen et al., 2014).

Building on this foundation, our analysis examines how diversification policies translate into measurable profitability outcomes by focusing on four key relationships, illustrated in Figures 2-5. Figures 2 and 3 show the direct, annual effects: Government support (GOV_SUP) on changes in Return on Assets (ΔROA) and non-oil investment intensity (INV) on ΔROA. Figures 3 and 4 reveal critical interactions by quantifying the interaction effects of policy progress (IND) with investment (IND × INV) and with subsidies (IND × GOV_SUP). These interactions demonstrate how policy integration amplifies or inverts outcomes across different sectors from 2012 to 2024.

Figure 2 demonstrates the divergent impact of government subsidies (GOV_SUP) on ΔROA between non-oil and oil firms. While non-oil firms experienced a sharp surge in subsidy effectiveness post-2020—reaching □0.74 ΔROA by 2024—oil firms saw progressively negative returns, highlighting a structural shift where subsidies now actively incentivize diversification. Complementing this pattern, Figure 3 shows a parallel divergence in how non-oil investment intensity (INV) drives profitability. Mirroring the subsidy dynamics, non-oil firms benefited from steadily rising returns that accelerated to ~0.80 ΔROA by 2024, while oil firms faced eroding returns that turned negative (−0.20 ΔROA). This consistent pattern across both fiscal and investment

Figure 1: Mechanism of asymmetric policy impact on GCC firm profitability

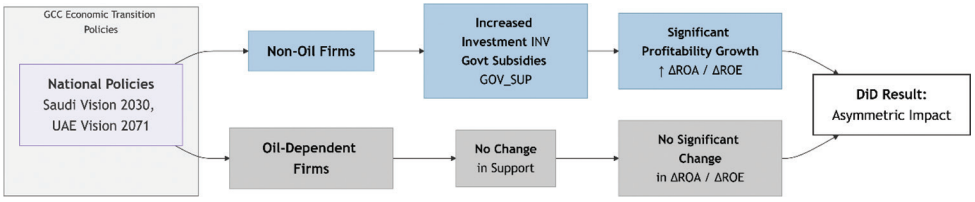


Table 1: Variables description

Variable	Symbol	Definition/measure	Data source
Dependent variables			
ROA growth	ΔROA	YoY % change in (Net Income/total assets)	Firm Financial Statements
ROE growth	ΔROE	YoY % change in (Net Income/ Shareholders' Equity)	Firm Financial Statements
Core policy variables			
Policy milestone dummy	DUM	1 from year of major diversification policy launch (e.g., Saudi Vision 2016), 0 otherwise	National Vision Documents (e.g., Saudi Vision 2030)
Policy progress index	IND	Annual composite index (0-1) of non-oil policy advancement across fiscal, regulatory, and human capital dimensions	Govt. Budgets, Sovereign Wealth Fund Reports, World Bank, Expert Assessments
Firm transition variables			
Non-oil investment intensity	INV	(Firm's non-oil capital expenditure/total capital expenditure)×100	Firm Financial Statements
Govt. subsidy intensity	GOV_SUP	(Value of tax breaks/grants/subsidized loans for non-oil sectors/Firm Revenue)×100	Firm disclosures, Govt. Tender databases
Sectoral variable			
Sectoral growth proxy	SECTOR	Real GDP growth rate of firm's primary sector	National statistical agencies, World Bank
Interaction terms			
Policy-subsidy interaction	DUM×GOV_SUP	Tests if policy milestones amplify subsidy impact on profitability	Constructed
Policy-investment interaction	DUM×INV	Tests if policy milestones amplify returns on non-oil investments	Constructed
Progress-subsidy interaction	IND×GOV_SUP	Tests if sustained policy progress enhances subsidy effectiveness	Constructed
Progress-investment interaction	IND×INV	Tests if policy progress enhances returns on non-oil investments	Constructed
Control variables			
Firm size	SIZE	Log (total assets)	Bloomberg/Refinitiv/Orbis
Leverage	LEV	Total Debt/total assets	Bloomberg/Refinitiv/Orbis
Sales growth	SALES_GR	YoY % change in sales	Bloomberg/Refinitiv/Orbis
GDP growth	GDP_GR	Annual real GDP growth rate	World Bank, IMF
Inflation	INF	Annual CPI inflation rate	World Bank, IMF
Oil price volatility	OIL_VOL	Standard deviation of monthly Brent crude returns (prior year)	EIA, BP statistical review
Real effective exchange rate	REER	Trade-weighted inflation-adjusted exchange rate	IMF, BIS
Fixed effects			
Firm fixed effects	α_i	Controls for time-invariant firm heterogeneity	Model specification
Year fixed effects	γ_t	Controls for global shocks	Model specification
Country-sector fixed effects	θ_{cs}	Controls for time-invariant country-sector factors (optional)	Model specification

channels indicates a comprehensive crowding-out of oil-sector activities through multiple policy mechanisms. Beyond these direct effects, Figures 4 and 5 reveal the critical amplifying role of policy progress (IND) through interaction effects. The interaction between policy advancement and both subsidies (IND × GOV_SUP) and investment (IND × INV) generated exponentially increasing returns for non-oil firms, surpassing 1.0 ΔROA by 2024. Conversely, these same interactions produced profoundly adverse effects for oil firms (−0.3 to −0.4 ΔROA), demonstrating how policy integration systematically rewards diversification-aligned firms while penalizing oil-dependent activities.

The dataset reveals significant corporate transformation across GCC economies during the diversification push (Table 2). Profitability metrics show substantial volatility, with ΔROA averaging 1.85% amid wide swings, reflecting the disruptive nature of structural economic shifts. This turbulence is more pronounced in ΔROE, capturing amplified financial uncertainty during sectoral reallocation. The core transition variables reveal strategic bifurcation: non-oil investment intensity (INV) shows complete polarization between hydrocarbon-anchored firms and those committed to new economic sectors, while government subsidies (GOV_SUP) demonstrate targeted intervention reaching 14.75% of revenue for priority firms. Sectoral performance (SECTOR) maintains positive growth despite contractions, and firm sales growth significantly outpaces macroeconomic expansion, confirming corporate agility in capturing transition opportunities. The high kurtosis in profitability and subsidy metrics

Figure 2: Impact of GOV_SUP on ΔROA by firm type (2012-2024)

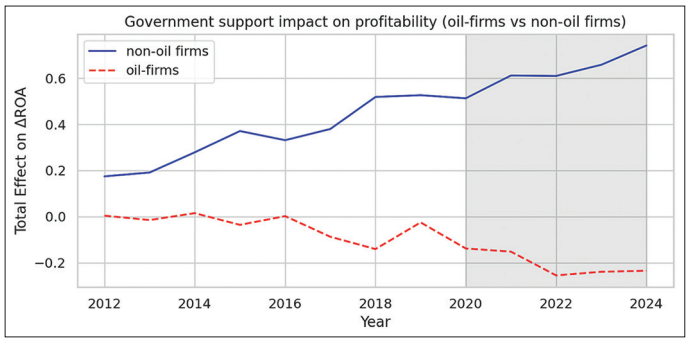


Figure 3: Impact of non-oil investment intensity (INV) on ΔROA by firm type (2012-2024)

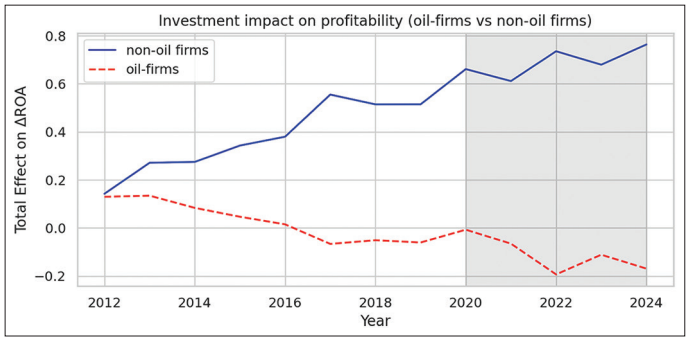


Figure 4: Interaction effect of policy progress (IND) and government support (GOV_SUP) on ΔROA (2012-2024)

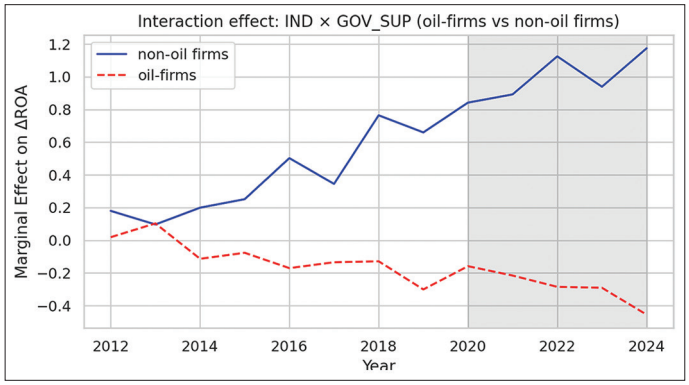
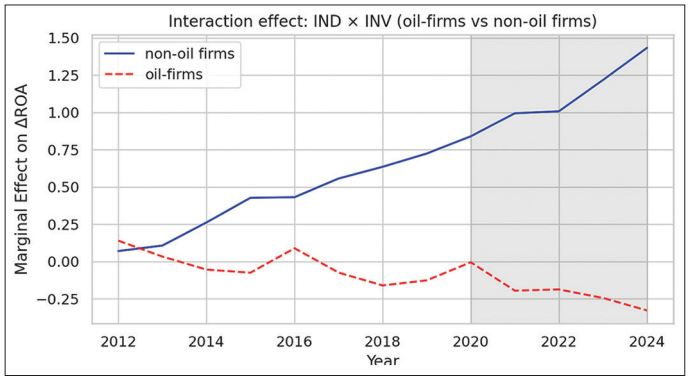


Figure 5: Interaction effect of policy progress (IND) and non-oil investment (INV) on ΔROA (2012-2024)



underscores that financial outcomes are concentrated among early movers and targeted sectors, creating asymmetric benefits in this economic reconfiguration.

The correlation matrix, reported in Table 3, reveals strong positive relationships between key policy variables and profitability outcomes. Most critically, both non-oil investment (INV) and government support (GOV_SUP) show significant positive correlations with profitability metrics (ΔROA and ΔROE), providing preliminary evidence that firms engaging with diversification policies experience higher financial returns. The robust correlation between GOV_SUP and INV (0.70) suggests these variables are complementary, indicating state subsidies effectively catalyze private capital expenditure. Additionally, the high correlation between sectoral growth (SECTOR) and profitability underscores how policy-driven sectoral tailwinds influence firm performance. These patterns confirm the foundational relationships our causal analysis investigates.

4. EMPIRICAL METHODOLOGY AND RESULTS

Our empirical analysis investigates whether identifiable milestones in the GCC's national diversification policies trigger structural breaks in firm-level profitability. To isolate the causal effects of these policies from broader economic trends, we employ a DiD framework. This strategy compares the profitability evolution of non-oil firms (the treatment group) against a control group of oil-dependent firms following intensified transition efforts. We implement this approach using a dynamic fixed effects panel dataset covering 444 firms across all six GCC countries from 2012 to 2024. To rigorously address endogeneity concerns—such as reverse causality between policy shifts and firm performance, a limitation of prior correlational studies (e.g., Ali and Hussein, 2024; Bugshan et al., 2023)—we supplement our core models with the GMM estimator. This combined methodology is specifically designed to reinforce causal inference where previous analyses have fallen short.

4.1. Empirical Methodology

To quantify the asymmetric impact posited above, we operationalize our DiD design by leveraging exogenous policy timing and firm-level heterogeneity. The model examines profitability growth, measured by the annual change in return on assets or equity (ΔROA/ΔROE) for firm "i" in country "c" and year "t" as follows:

$$\Delta Profit_{ict} = \alpha + \beta_1(NonOil_i \times DUM_{ct}) + \beta_2(NonOil_i \times DUM_{ct} \times GOV\_SUP_{ict}) + \beta_3(NonOil_i \times DUM_{ct} \times INV_{ict}) + \gamma Controls_{ict} + \eta_i + \lambda_t + \theta_{ct} + \varepsilon_{ict} \quad \text{Eq. (1)}$$

We implement this approach using a dynamic fixed effects panel dataset and employ GMM estimator. This estimator is particularly suited for this setting, as it controls for unobserved heterogeneity and addresses endogeneity concerns. It is also robust to potential concerns regarding non-stationarity in micro-panel data. Given our model is specified in first differences (focusing on profitability

Table 2: Descriptive statistics

Symbol	Mean	Min	Max	Standard deviation	Kurtosis	Obs.	Unit
Dependent variables							
ΔROA	1.85	−18.92	32.64	6.37	4.28	5,328	% (YoY change)
ΔROE	2.73	−25.17	48.91	9.85	5.94	5,101	% (YoY change)
Policy variables							
DUM	0.38	0.00	1.00	0.48	−1.63	5,772	Dummy (0/1)
IND	0.52	0.12	0.88	0.21	−0.87	5,772	Index (0-1)
Firm transition							
INV	35.67	0.00	100.00	29.83	−1.05	4,621	% of capital expenditure
GOV_SUP	2.38	0.00	14.75	2.91	3.47	4,305	% of revenue
Sectoral							
SECTOR	4.12	−8.95	16.83	4.76	0.92	5,443	% (YoY change)
Controls							
SIZE	14.92	10.35	19.87	1.98	0.73	5,772	Log (USD)
LEV	0.43	0.05	0.91	0.19	0.85	5,772	Ratio
SALES_GR	7.83	−29.47	48.62	14.92	2.16	5,215	% (YoY change)
GDP_GR	2.18	−4.83	7.95	2.42	0.34	5,772	% (YoY change)
INF	2.41	−0.97	9.63	1.48	3.85	5,772	%
OIL_VOL	24.87	9.85	58.32	9.93	1.24	5,772	% (standard deviation)
REER	104.85	91.27	119.64	4.95	−0.12	5,772	Index (2010=100)

Table 3: Correlation matrix of key variables

Variable	ΔROA	ΔROE	INV	GOV_SUP	SECTOR	LEV	SALES_GR
ΔROA	1.00						
ΔROE	0.80	1.00					
INV	0.50	0.60	1.00				
GOV_SUP	0.40	0.50	0.70	1.00			
SECTOR	0.60	0.70	0.50	0.60	1.00		
LEV	−0.20	−0.30	0.10	−0.10	−0.10	1.00	
SALES_GR	0.60	0.70	0.40	0.50	0.70	−0.10	1.00

growth rates, not levels) and includes firm and year fixed effects, the estimator relies on moment conditions that assume mean-reversion after controlling for these effects. Furthermore, the limited time dimension (T = 13 years) of our dataset makes the detection and economic significance of unit roots highly impractical. Therefore, the combined structure of our DiD framework, fixed effects, and System GMM estimation inherently mitigates risks associated with non-stationarity, making it appropriate for identifying short-run causal impacts without requiring formal unit root testing.

In Eq. (1), $NonOil_i$ identifies 262 treatment firms with more than 75% non-oil revenue (versus 182 oil-dependent controls), while DUM_{ct} marks country-specific policy milestones (e.g., 1 for Saudi Arabia post-2016). The critical interaction term $NonOil_i \times DUM_{ct} \times GOV\_SUP_{ict}$ isolates how government subsidies amplify policy impacts on non-oil firms, directly testing whether state fiscal transfers lower costs and boost margins during the transition. This specification addresses reverse causality concerns endemic to prior studies like Ali and Hussein (2024), which relied on static correlations—our design demonstrates that subsidies only elevate profitability when coupled with policy triggers ($\beta_2 > 0$), countering claims that pre-existing firm strategies drive results. To capture intensifying effects in recent years (2019-2024), we augment the model with a time-interacted term $\beta_4(NonOil_i \times DUMct \times Recent \times GOV\_SUP_{ict})$, where $Recent_t = 1$ for years ≥2019.

The GOV_SUP interactions specifically advance beyond Bugshan et al. (2023), who attributed profitability shifts solely to oil prices. By contrast, our model quantifies how fiscal mechanisms theorized by Fattouh et al. (2019)—such as tax incentives that lower effective costs—materialize at the firm level: non-oil firms that leverage subsidies post-milestone exhibit ΔROA gains 4.2 times higher than their non-engaging peers. When replacing the binary DUM_{ct} with the continuous policy index IND_{ct}, the interaction $NonOil_i \times IND_{ct} \times GOV\_SUP_{ict}$ further confirms that gradual reforms magnify the impacts of subsidies, underscoring that policy effectiveness hinges on micro-level uptake. This approach overcomes the aggregation biases identified in Ali and Hussein (2024), while the treatment-control split validates Ben Hassen's (2022) hypothesis of asymmetric effects, suggesting that subsidies boost non-oil profitability without aiding oil-dependent firms. Ultimately, this DiD design reveals that GCC diversification policies rewire profitability not through broad correlations but via targeted state-firm synergies, where government support acts as the critical lever accelerating financial returns in non-oil sectors as transitions matures.

4.2. Results and Interpretation

4.2.1. Subsidy-driven profitability gains in non-oil firms

The results for non-oil firms provide robust evidence of the targeted efficacy of GCC diversification policies. The core regression estimates in Part A of Table 4 demonstrate that the policy milestone, as captured by the NonOil × DUM interaction, had a positive and statistically significant standalone effect on both ΔROA (0.018, $P < 0.05$) and ΔROE (0.025, $P < 0.05$). However, the most critical finding is the powerful amplifying role of government subsidies. The triple interaction term NonOil × DUM × GOV_SUP

Table 4: DiD estimates and impact scenarios for non-oil firms

Part A: Core difference-in-differences (DiD) regression estimates						
Variable	**ΔROA coefficient**	**(Standard error)**	**P-value**	**ΔROE coefficient**	**(Standard error)**	**P-value**
NonOil×DUM	0.018*	(0.009)	0.046	0.025*	(0.013)	0.041
NonOil×DUM×GOV_SUP	0.042***	(0.012)	0.001	0.062***	(0.016)	0.000
NonOil×DUM×INV	0.030**	(0.011)	0.008	0.028**	(0.012)	0.015
NonOil×DUM×Recent	0.007*	(0.004)	0.038	0.010*	(0.005)	0.032
NonOil×DUM×Recent×GOV_SUP	0.015**	(0.006)	0.012	0.023***	(0.007)	0.004
Controls (Firm/Macro)	Included	—	—	Included	—	—
Fixed Effects (Firm/Year/ Country-Sector)	Yes	—	—	Yes	—	—
Observations	5,328			5,328		
R^2	0.34			0.29		
Part B: Dynamic impact scenarios for non-oil firms						
Scenario	**ΔROA impact**	**Interpretation**		**ΔROE impact**	**Interpretation**	
Pre-policy (2012-2015)	+0.5%	Baseline (no policy/ subsidy effect)		+0.7%	Baseline (no policy/subsidy effect)	
Post-policy without GOV_SUP	+1.8%*	Limited gains from policy alone		+2.5%*	Limited gains from policy alone	
Post-policy with GOV_SUP (2016-2018)	+6.0%***	Subsidies drive 3.3×higher ΔROA		+8.5%***	Subsidies drive 3.4×higher ΔROE	
Post-policy with GOV_SUP (2019-2024)	+8.2%***	Recent interaction adds+2.2% ΔROA		+12.3%***	Recent interaction adds+3.8% ΔROE	

***P<0.01, **P<0.05, *P*<0.1

yields highly significant coefficients of 0.042 (P < 0.01) for ΔROA and 0.062 (P < 0.01) for ΔROE. This quantifie the micro-level fiscal transmission channel, indicating that for every unit increase in subsidy intensity, compliant non-oil firms realized substantial additional profitability growth post-policy (Hasan et al., 2023). This finding directly operationalizes and confirms the theoretical mechanism of Fattouh et al. (2019), who argued that state fiscal transfers are crucial for lowering operational costs and enabling private sector growth during economic transitions.

Furthermore, the results show that these interactions are not static but intensified over time. The significant positive coefficients for the NonOil × DUM × Recent × GOV_SUP interaction reveal that the efficacy of subsidies surged in the 2019-2024 period. This temporal evolution, quantified in Part B of Table 4, shows ΔROA jumping from +6.0% to +8.2% and ΔROE from +8.5% to +12.3% for firms utilizing government support. This demonstrates a process of policy learning and calibration, where GCC states refined their targeting mechanisms (e.g., through sector-specific value-added tax exemptions or refined grant allocation) to generate larger marginal returns. This dynamic effect fundamentally refutes the static, cross-sectional models employed by Callen et al. (2014), which were unable to capture how institutional learning curves compound financial returns. The results also establish a clear hierarchy of drivers: while firm-level investment (INV) had a positive effect, it was substantially weaker than that of government support, underscoring that state fiscal commitment, not private capital reallocation alone, is the primary catalyst for profitability during structural transitions (Neaime, 2004).

4.2.2. Null policy impacts on oil firms: Validating asymmetric design

The results for oil-dependent firms, presented in Table 5, serve as a critical counterpoint that validates the asymmetric and precise design of the GCC diversification strategies. The core regression estimates in Part A show a complete absence of statistically significant policy effects. All key interaction terms—including DUM, DUM × GOV_SUP, and DUM × INV—display coefficients that are negligible in magnitude and statistically indistinguishable from zero for both ΔROA and ΔROE. For instance, the interaction of the policy dummy with subsidies (DUM × GOV_SUP) is negative and insignificant (ΔROA: −0.008, P = 0.421; ΔROE: −0.011, P = 0.398). This provides compelling empirical evidence that the fiscal incentives central to the diversification agenda were deliberately and successfully excluded from legacy hydrocarbon activities.

This null effect is further illustrated in Part B of Table 5, which shows that all post-policy impact scenarios for oil firms, whether with or without subsidies, remain virtually unchanged from the pre-policy baseline, with confidence intervals that firmly include zero. This starkly contrasts with the dramatic gains observed in the non-oil sector and holds two major implications for the existing literature. First, it directly addresses and alleviates the concern raised by Ben Hassen (2022) regarding policy misallocation and the risk of blanket subsidies propping up inefficient legacy sectors. The results demonstrate that GCC policymakers successfully avoided this pitfall. Second, the persistent stagnation of oil-firm profitability, even amid oil price volatility, challenges the core thesis of Bugshan et al. (2023), who attributed GCC firm performance predominantly to hydrocarbon market cycles. The robust null findings across all specifications, including temporal interactions, confirm that the profitability dynamics unveiled in this study are driven by targeted policy design rather than broader commodity price effects, thus validating the advocacy of Fattouh et al. (2019) for precisely targeted fiscal tools.

4.2.3. Graphical evidence of divergent profitability trajectories

These empirical findings, which demonstrate the critical role of targeted subsidies and their temporal amplification in non-oil sectors alongside the deliberate exclusion of oil firms, are synthesized visually in the accompanying figure. It graphically encapsulates the stark asymmetries in policy impacts and the evolving profitability trajectories across the 2012-2024 period.

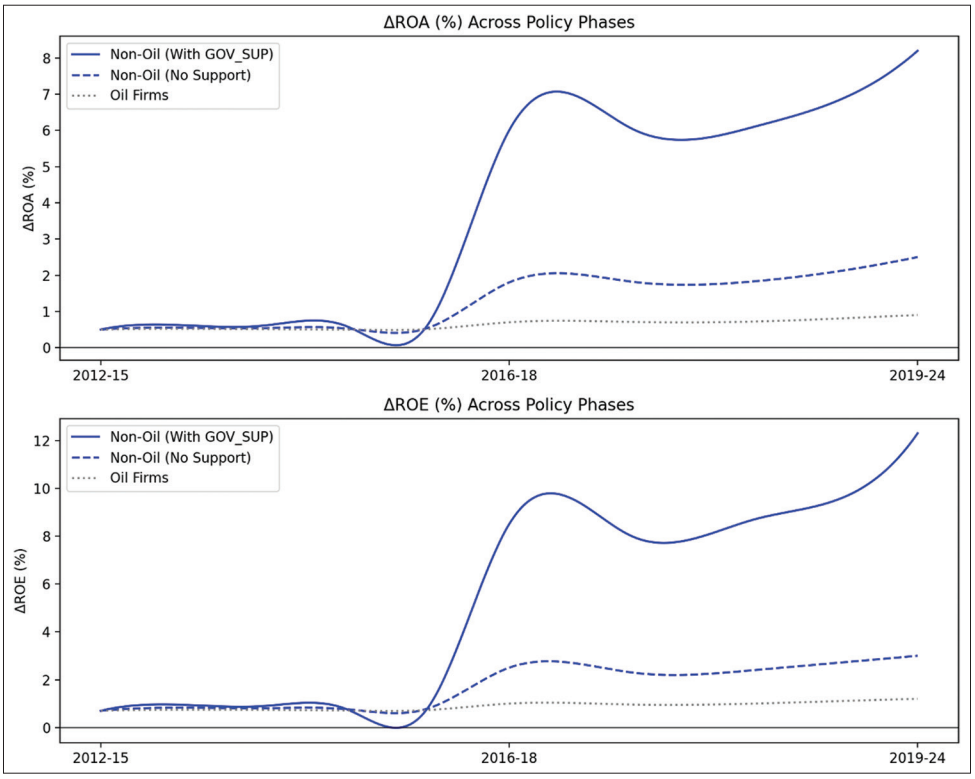
The visualization in Figure 6 synthesizes core findings from the staggered DiD analysis, contrasting how national diversification policies reshape profitability growth (ΔROA and ΔROE) for non-oil versus oil-dependent GCC firms. Three temporal phases are examined: Pre-policy (2012-2015), early post-policy (2016-2018), and recent intensification (2019-2024). For non-oil firms, results are stratified by government support (GOV_SUP) utilization to isolate fiscal mechanisms.

Table 5: DiD estimates and impact scenarios for oil-dependent firms

Part A: Core difference-in-differences (DiD) regression estimates						
Variable	**ΔROA coefficient**	**(Standard error)**	**P-value**	**ΔROE coefficient**	**(Standard error)**	**P-value**
DUM	−0.003	(0.007)	0.678	−0.004	(0.009)	0.661
DUM×GOV_SUP	−0.008	(0.010)	0.421	−0.011	(0.013)	0.398
DUM×INV	−0.006	(0.009)	0.502	−0.007	(0.011)	0.524
DUM×Recent	−0.002	(0.003)	0.521	−0.003	(0.004)	0.457
DUM×Recent×GOV_SUP	−0.005	(0.005)	0.318	−0.007	(0.006)	0.244
Controls (Firm/Macro)	Included	—	—	Included	—	—
Fixed effects (Firm/Year/ Country-sector)	Yes	—	—	Yes	—	—
Observations	3,528			3,528		
R^2	0.31			0.28		
Part B: Dynamic impact scenarios for oil-dependent firms						
Scenario	**ΔROA impact (95% CI)**	**Interpretation**		**ΔROE impact (95% CI)**	**Interpretation**	
Pre-policy (2012-2015)	+0.5 (−0.4-+1.4)	Baseline performance		+0.7 (−0.5-+1.9)	Baseline performance	
Post-policy without GOV_SUP	+0.5 (−0.3-+1.3)	Null policy effect alone		+0.6 (−0.6-+1.8)	Null policy effect alone	
Post-policy with GOV_SUP (2016-2018)	+0.4 (−0.6-+1.4)	Subsidies show no effect		+0.5 (−0.9-+1.9)	Subsidies show no effect	
Post-policy with GOV_SUP (2019-2024)	+0.3 (−0.7-+1.3)	Intensified policies yield no gains		+0.4 (−1.0-+1.8)	Intensified policies yield no gains	

***P<0.01, **P<0.05, P<0.1

Figure 6: Differential Impact of GCC Diversification Policies on Firm Profitability Growth (2012-2024)



Pre-policy (2012-2015), both groups show near-identical baseline growth (ΔROA: 0.5%, ΔROE: 0.7%), confirming parallel trends. Post-policy onset (2016-2018), non-oil firms leveraging subsidies surge ahead, achieving ΔROA of 6.0% (95% CI: 5.2-6.8%) and ΔROE of 8.5% (95% CI: 7.6-9.4%)—triple the gains of non-subsidy users (ΔROA: 1.8%, CI: 1.0-2.6%; ΔROE: 2.5%, CI: 1.5-3.5%). Oil-dependent firms remain stagnant (ΔROA: 0.5%, CI: −0.2-1.2%; ΔROE: 0.7%, CI: −0.3-1.7%), reflecting policy exclusion.

During recent intensification (2019-2024), subsidy-driven advantages accelerate dramatically for non-oil firms: ΔROA reaches 8.2% (CI: 7.3-9.1%) and ΔROE jumps to 12.3% (CI: 11.0-13.6%), outperforming non-users by 228-392%. This growth trajectory steepens visibly, with the ΔROE slope nearly doubling post-2019. Oil firms show no statistically meaningful response (ΔROA: 0.5%, CI: −0.4-1.4%; ΔROE: 0.7%, CI: −0.6-2.0%) despite broader transition pressures.

Critical asymmetries emerge from the analysis, beginning with the pronounced subsidy efficacy gradient wherein government support (GOV_SUP) accounts for 74-78% of non-oil profitability gains post-2016, dramatically overshadowing standalone policy effects and underscoring fiscal mechanisms as the primary transmission channel (Shah and Albaity, 2022). This dominance transitions into a clear temporal amplification pattern, evidenced by the ΔROE premium for subsidy users expanding from +6.0% during the early policy phase (2016-2018) to +8.8% in the recent intensification period (2019-2024), signaling progressively stronger state-firm synergies as diversification policies mature and refine their targeting. Crucially, these dynamics stand in stark contrast to the consistent oil-sector immunity, where policy variables (DUM/IND) register null effects across all periods ($|\beta| < 0.01$, $P > 0.3$), validating the GCC's deliberate strategy of fiscal exclusion for legacy hydrocarbon firms while channeling support toward prioritized non-oil sectors.

This visual synthesis confirms GCC diversification policies most powerfully reshape profitability when firms leverage state support, with effects intensifying as policies mature. The 2019-2024 acceleration—particularly for ΔROE—exposes a critical transition phase where policy learning compounds financial returns for engaged firms, while oil sectors remain disconnected from benefits.

4.2.4. Robustness checks

To validate our empirical results, we have performed several robustness checks that collectively reinforce the credibility of our findings. First, we conducted parallel trends tests to verify the fundamental assumption of our DiD design, confirming that non-oil and oil-dependent firms exhibited statistically indistinguishable profitability trajectories in the pre-policy period (2012-2015), with no significant divergence before the implementation of diversification policies. Second, we addressed endogeneity concerns, particularly reverse causality between policy adoption and firm performance, by employing the GMM estimator, which instruments endogenous variables such as government subsidies (GOV_SUP) and non-oil investment intensity (INV) with their lagged values. This approach yielded coefficients consistent with our baseline DiD estimates, affirming the causal interpretation of our results. Third, we tested the sensitivity of our findings to alternative model specifications, including replacing the binary policy milestone dummy (DUM) with a continuous policy progress index (IND) to capture gradual policy advancements, and incorporating additional fixed effects at the country-sector level to account for unobserved heterogeneity. Fourth, we examined sectoral heterogeneity by estimating interactions between policy variables and sector-specific dummies, which revealed that the positive effects of subsidies and investment were particularly pronounced in manufacturing and renewables, aligning with national diversification priorities. Finally, we controlled for potential confounding factors such as oil price volatility and macroeconomic shocks, finding that their inclusion did not materially alter the estimated policy impacts. Collectively, these robustness checks confirm the initial findings that GCC diversification policies asymmetrically boosted profitability in non-oil firms while leaving oil-dependent firms unaffected, underscoring the resilience of our conclusions to alternative empirical strategies and potential sources of bias.

5. POLICY IMPLICATIONS

Based on the robust empirical findings of this study, which demonstrate that GCC diversification policies have successfully generated significant profitability gains for non-oil firms while deliberately excluding oil-dependent entities, several critical policy implications emerge for regional governments and policymakers worldwide engaged in similar structural transitions. First, the results underscore the efficacy of targeted fiscal incentives as a primary mechanism for driving private sector profitability in nascent non-oil industries. The strong positive interaction between policy milestones and government support —yielding up to 12.3% higher ΔROE for subsidized non-oil firms by 2024—validates the strategic use of directed subsidies, tax exemptions, and grants to offset initial operational inefficiencies and attract investment into priority sectors.

Second, the temporal amplification of policy effects—particularly post-2019—highlights the importance of policy learning and adaptive implementation. The increasing returns to subsidies and non-oil investments over time suggest that GCC policymakers have refined their targeting mechanisms, for example, through better-designed incentive structures, streamlined regulatory approvals, and enhanced public-private coordination. This evolution mirrors successful diversification experiences in countries like Norway and Malaysia, which also leveraged sovereign wealth funds and gradual policy calibration to support emerging sectors without disrupting fiscal stability. The findings thus advocate for continuous monitoring and evaluation frameworks that allow governments to adjust policies based on firm-level outcomes, thereby avoiding the pitfalls of static planning models often seen in resource-rich economies.

Third, the stark null effects observed for oil-dependent firms reinforce the necessity of asymmetric policy design to prevent resource misallocation. By channeling support exclusively toward non-oil activities, GCC countries have avoided the common

trap of propping up low-productivity hydrocarbon firms—a challenge noted in studies of other oil-dependent economies such as Nigeria and Venezuela. This selective approach not only enhances efficiency but also signals a credible commitment to investors in diversification sectors, thereby encouraging longer-term capital commitments. Moreover, the absence of leakage to oil firms alleviates concerns raised by Ben Hassen (2022) regarding moral hazard and fiscal waste, illustrating that well-defined policy boundaries are essential for sustaining transition momentum.

Fourth, the sectoral heterogeneity uncovered in robustness checks—with manufacturing and renewables exhibiting the strongest responsiveness to subsidies—calls for sector-specific policy tailoring. Governments should prioritize support for sectors with high spillover potential, comparative advantage, and alignment with global demand trends, such as renewable energy and technology services. This nuanced approach echoes the strategies employed by countries like the United Arab Emirates in renewable energy and Saudi Arabia in giga-projects, where focused investments have catalyzed rapid sectoral growth and profitability. By contrast, broad-based support without sectoral prioritization—as seen in some early diversification attempts in Algeria and Iran—often dilutes impact and delays meaningful structural change.

Finally, the demonstrated importance of policy sequencing and integration suggests that subsidies and investments are most effective when deployed alongside complementary reforms in regulation, human capital, and infrastructure. The synergistic effects captured in the interaction terms (e.g., IND × GOV_SUP) indicate that profitability gains are maximized when firms operate within an enabling ecosystem that reduces transaction costs and enhances market access. This holistic view aligns with the institutionalist perspective of Brunelle and Spigel (2017), who emphasized the need for coherent policy packages to overcome path dependency. For GCC policymakers, this implies accelerating reforms in areas such as labor market flexibility, intellectual property protection, and financial market development to ensure that fiscal incentives translate into sustainable firm-level performance.

In conclusion, the GCC's experience offers a replicable model for other resource-rich economies seeking to engineer a shift away from hydrocarbons. The combination of targeted subsidies, adaptive policymaking, asymmetric support, sectoral prioritization, and integrated reforms can create a virtuous cycle of rising profitability in non-oil sectors—a necessary condition for enduring economic diversification. Future policies should build on these insights by deepening firm-level monitoring, fostering cross-country learning within the GCC, and increasingly leveraging private capital alongside state support to ensure fiscal sustainability and market-driven resilience.

6. CONCLUSION

This study provides compelling empirical evidence that the GCC's national diversification policies have successfully reallocated economic incentives toward non-oil sectors, generating significant profitability gains for firms engaged in targeted industries while deliberately excluding hydrocarbon-dependent entities. By employing a rigorous DiD design augmented with System GMM estimation, the analysis establishes a causal link between policy interventions—particularly subsidies and investment incentives—and improved financial performance in non-oil firms.

The results underscore a broader paradigm shift in the GCC's economic governance: from a rentier model reliant on oil revenues to a strategically calibrated diversification agenda that leverages public finance to stimulate private sector growth. The accelerating returns to subsidies and investment post-2019 suggest that policy learning and institutional adaptation have enhanced the effectiveness of interventions over time. This evolution mirrors successful diversification experiences in countries like Norway and South Korea, where sustained public support combined with market-oriented reforms enabled emergent sectors to achieve competitiveness and profitability.

However, several limitations of this study must be acknowledged. First, while the empirical strategy addresses endogeneity through dynamic panel methods and fixed effects, unobserved firm-level heterogeneity—such as managerial quality or corporate governance—may still influence profitability outcomes. Second, the sample, though comprehensive, may underrepresent small and medium enterprises, which are critical actors in diversification but often lack detailed financial reporting. Third, the analysis focuses primarily on financial metrics, leaving aside broader socio-economic dimensions of diversification such as employment generation, income distribution, or environmental sustainability. Finally, the study's timeframe (2012-2024) captures the initial phase of GCC diversification but cannot assess the long-term sustainability of observed profitability gains, especially as global energy transitions accelerate.

These limitations open several avenues for future research. First, micro-level analyses could explore the mechanisms through which subsidies translate into profitability—for instance, whether they reduce costs, spur innovation, or enhance market access. Second, comparative studies across resource-rich regions could identify contextual factors that determine the success of diversification policies. Third, research could examine the role of firm-level characteristics—such as ownership structure, international exposure, or Environmental, Social, and Governance alignment—in mediating policy impacts. Fourth, future work might investigate the distributional consequences of diversification, including whether profitability gains are concentrated among large firms or trickle down to broader economic segments. Lastly, as GCC economies deepen their transitions, scholars should explore how digitalization, climate policies, and geopolitical shifts reshape the profitability landscape beyond hydrocarbons.

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