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The macroeconomic Impact of Oil Price Shocks: A Panel Data Analysis of Six Oil-Exporting Countries

1. Introduction

Oil prices are among the most influential variables in the global economy, simultaneously acting as both economic signals and sources of macroeconomic disruption. (Hamilton, 1983) For oil-exporting countries, where hydrocarbon revenues constitute the fiscal lifeblood of the state, oil price movements carry far-reaching implications—not just for budgets and growth, but also for labor markets. Yet while extensive literature exists on the relationship between oil shocks and inflation, output, and financial markets, relatively little is known about how oil price volatility shapes labor market dynamics—particularly unemployment and real wages—in resource-dependent economies : “There is a limited number of studies that have examined the impact of oil prices, oil price uncertainty and oil price volatility on labour market outcomes” (Palaios and Papapetrou, 2022)

This research investigates the effects of oil price fluctuations on labor market statistics including unemployment rates and wage levels throughout Saudi Arabia and five additional oil-exporting nations including Kuwait, Qatar, Oman, Bahrain and Egypt. These countries were selected due to their substantial reliance on hydrocarbon revenues, which makes their economies particularly vulnerable to oil price volatility and its broader labor market implications.

According to the IMF’s 2024 Article IV Consultation, Saudi Arabia’s fiscal position remains heavily dependent on oil revenues, which continue to contribute significantly to government income despite the progress made under Vision 2030 to diversify the economy (IMF, 2024a). Similarly, Kuwait’s economy is characterized by a high degree of hydrocarbon dependence, with oil revenues forming the backbone of fiscal policy and public sector funding (IMF, 2024b). In Qatar, while there has been advancement in economic diversification, the hydrocarbon sector still plays a pivotal role, accounting for the majority of export and government revenues (IMF, 2025a).

Oman’s government finances also remain closely tied to the oil sector, with the IMF noting in its 2024 consultation that fluctuations in oil prices have a direct and substantial effect on budgetary performance and stated that "a carefully selected fiscal rule will help shield the budget from oil price volatility, strengthen fiscal discipline, and accumulate sufficient financial buffers." (IMF, 2024c). Bahrain faces similar challenges, with hydrocarbon income continuing to dominate public revenue despite efforts to boost non-oil sectors (IMF, 2024d). Though Egypt is a net energy importer, the IMF highlights that the country's economy remains exposed to oil market dynamics due to its energy-intensive industries and regional economic linkages (IMF, 2025c).

By analyzing these six countries—each with varying levels of oil dependency and economic diversification—this study offers a comparative view on how oil price volatility impacts labor market outcomes in resource-dependent economies.

The research investigates two essential points: oil price volatility together with its magnitude directly affects unemployment rates and wage patterns while these impacts become more pronounced through structural oil dependence. The economic dynamics hold special significance for countries with large public sector employment and restricted labor market adaptability and incomplete economic diversification initiatives.

Understanding these labor responses is essential for at least three reasons. First, unemployment and wage stagnation are not just economic indicators—they are core determinants of social stability and human capital formation. Second, oil-exporting states are undergoing a generational shift in development strategy, particularly in the Gulf, where governments are attempting to recalibrate their economic models away from oil dependency. Third, as oil markets experience increasing volatility due to geopolitical shocks, climate transitions, and demand-side uncertainty, the resilience of labor markets is becoming a litmus test for economic sustainability.

This study aims to address four key inquiries:

- How do fluctuations in oil prices impact the job market and salary trends in countries that rely on oil exports in the long run?
- Do oil boom and bust cycles lead to labor outcomes that are symmetric in their magnitude and direction?
- Is the level of reliance on oil a factor in how oil prices affect labor market performance?
- What are the variations in labor reactions between economies that are highly oil-dependent and those with more diversified economic structures?

This study presents a framework using panel data from 1989 to 2025, merging monthly oil price data with annual labor and macroeconomic metrics. The research methodology focuses on the interaction between oil prices and a country's oil dependence (measured by oil exports as a percentage of GDP), allowing the analysis to identify heterogeneous effects of oil shocks across countries. The empirical analysis is carried out using fixed effects panel regression models with both time and country-specific fixed effects, and is implemented using Stata 18. This software is used due to robust and efficient environment for managing big datasets and conducting econometrics analysis.

2. Literature Review

2.1. Classical Foundations and Modern Extensions

Hamilton (1983) discovered the relationship between oil price shocks and macroeconomic volatility through his research which demonstrated that most U.S. post-World War II recessions started with rising oil prices. Mork (1989) built upon this discovery by demonstrating that economic activity responds differently to rising and falling oil prices. Kilian (2009) further developed the field by distinguishing between demand- and supply-driven oil shocks, offering a more refined understanding of their transmission mechanisms.

Although these studies laid the foundations for oil macroeconomics, they paid little attention to labor market outcomes. More recent work by Elder (2018), using SVAR and GARCH-in-Mean models, found that oil price volatility has a more severe impact on industrial production and investment delays than price levels alone. These findings echo the logic of real options theory, which suggests that uncertainty increases the value of delaying irreversible decisions—such as hiring or wage adjustments.

2.2. Labor Market Outcomes and Oil Dependence

The labor market channel receives growing attention yet researchers have not fully explored this topic particularly in oil-exporting countries. Moshiri (2015) demonstrated that OPEC countries experience rising unemployment during negative oil price fluctuations but positive oil price fluctuations produce minimal and brief employment benefits. Cheratian et al. (2019) discovered that oil booms in MENA countries lead to unemployment growth because Dutch Disease effects cause exchange rate appreciation which diminishes non-oil tradable sector competitiveness and redirects labor demand toward low-productivity service industries. The study of wage behavior remains understudied in existing research. The majority of studies fail to consider how inflation together with fiscal policy and labor market rigidity influence real wages when responding to oil price shocks. Research on labor market outcomes shows minimal attention to the differences between economies based on their oil dependence levels. The research investigates both gaps by developing a model that examines how oil price shocks interact with structural dependence to affect labor market indicators.

2.3. Asymmetry, Volatility, and Institutional Frictions

A growing body of literature suggests that economies respond asymmetrically to oil booms and busts. Wage increases and job creation during booms are often sluggish, constrained by bureaucratic hiring processes and political inertia. In contrast, layoffs and wage freezes during downturns are implemented quickly and often affect large segments of the labor force. Gunwant et al. (2024) confirm this in the context of Saudi Arabia: oil price volatility raises inflation and fiscal unpredictability, but reduced volatility does not generate equivalent economic relief. This asymmetry likely extends to labor markets, reinforcing the need for dynamic modeling that captures nonlinear and time-varying effects.

3. Theoretical Framework

The labor market experiences four main channels through which oil price shocks operate:

1. Fiscal Demand Effects: The government receives higher revenue from positive oil shocks which enables them to create jobs and raise wages especially in public sector positions. Economic downturns often lead to cuts in public sector employment, particularly in countries where the government is a major employer in the labor market.

2. Real Wages and Inflation Pass-Through: The cost of oil tends to increase when prices rise. Real wages decrease when nominal wages fail to match the rising cost of living. The unemployment rate tends to increase when wage-setting mechanisms remain inflexible because of collective bargaining agreements or public sector wage standards.

3. Dutch Disease and Sectoral Shifts: The appreciation of the real exchange rate during oil booms negatively affects non-oil exports which leads to labor movement from tradables to public and low-productivity sectors. The improper distribution of resources leads to sustained structural unemployment problems.

4. Volatility and Hiring Delays (Real Options Theory): Companies tend to avoid hiring new staff and wage increases when operating under conditions of uncertainty. The unpredictable nature of oil prices creates economic uncertainty which forces businesses in oil-dependent economies to delay their workforce decisions even when they receive substantial oil revenue. The mechanisms show that both oil price volatility and levels create instability in labor markets. The impact of these mechanisms becomes more pronounced when a country depends heavily on oil production and has limited flexibility in its labor institutions.

4. Methodology

This thesis uses panel data econometrics to evaluate how oil shocks affect unemployment and wages in oil-exporting countries. The core innovation is the inclusion of an interaction term between oil prices and the country-specific oil dependence ratio, capturing heterogeneous treatment effects across structurally different economies.

4.1. Data

Countries: Saudi Arabia, Kuwait, Qatar, Oman, Bahrain, Egypt

Period: 1989–2025

Sources: IMF, World Bank, EIA, national statistical bureaus

Variables:
Unemployment rate in the percentage rate
real wage index
Monthly oil prices (WTI and Brent)
Oil exports as percentage of GDP
Inflation, GDP (constant USD), and population

Data is compiled and structured in Excel, then imported into **Stata 18** for model estimation. Monthly oil prices are used to estimate volatility using a GARCH(1,1) model, producing a time-varying uncertainty measure.

Step 1

We start out empirical research by having regression model that consist of related to the oil topic variables:

$$ucc_{ct} = \beta_1 + \beta_2 \cdot oil_t + \beta_3 \cdot controls_{ct} + \lambda_c + u_{ct}$$

Where:

- ucc_{ct}: Labor market outcome (e.g., unemployment rate or wage growth) in country c at time t
- oil_t: Global oil price at time t
- $controls_{ct}$: Vector of control variables such as inflation, GDP growth, population
- λ_c: Country fixed effects, controlling for unobserved, time-invariant country characteristics
- u_{ct}: Error term

This regression model estimates oil price volatility over time across different countries so we can have well-rounded findings. It holds other economic variables as contant to estimate average effect of oil price changes on labor outcomes across countries.

$$\frac{d\,ucc}{d\,oil_t} = \hat{\beta}_2$$

Step 2: Interaction with Oil Dependence

To permit the effect of oil price shocks to differ across countries based on each country's level of oil dependence, we expand the model to include an interaction term between the oil price and a measure of oil dependence:

$$ucc_{ct} = \beta_1 + \beta_2 \cdot OilPrice_t + \gamma_2 \cdot \left(OilPrice_t \times \frac{OilExports_c}{GDP_c} \right) + \lambda_c + \lambda_t + u_{ct}$$

$\frac{oilexports_c}{GDP_c}$:

Country ccc's structural oil dependence, measured as the ratio of oil exports to GDP.

Interpretation:
The marginal effect of oil prices is no longer constant but varies depending on oil dependence. It is now given by

$$\frac{d\,ucc}{d\,oil_t} = \hat{\beta}_2 + \hat{\gamma}_2 \cdot \left(\frac{oilexports_c}{GDP_c} \right)$$

is the coefficient on the oil dependence times oil price interaction term. This formulation allows us to test whether oil price shocks have a stronger (or weaker) effect in countries that are more dependent on oil revenues.

Step 3: Controlling for Global Shocks with Time Fixed Effects

Oil prices are set at the global level and are affected by factors such as geopolitical events, financial crises, and pandemics. In order to capture the country-specific effect of oil prices rather than the global trend, we add time fixed effects to the model:

$$ucc_{ct} = \beta_1 + \gamma_2 \cdot \left(oil_t \times \frac{oilexports_c}{GDP_c} \right) + \lambda_c + \lambda_t + u_{ct}$$

λ : Time fixed effects (year dummies), capturing shocks or trends that are common to all countries in a given year (e.g., the 2008 financial crisis, COVID-19) because oil prices are considered part of the global environment, now absorbed by time fixed effects. What remains is the interaction effect, which captures how the impact of global oil prices differs across countries based on their level of oil dependence.

Thus, the model now focuses on cross-country variation in responsiveness to oil shocks, conditional on structural exposure to oil.

Chapter 5: Empirical Results and Model Implementation

5.1. Introduction and Rationale

The research presents its empirical findings by analyzing how oil price fluctuations and their volatility impact macroeconomic results such as real GDP growth and unemployment and inflation rates across Saudi Arabia, Kuwait, Qatar, Oman, Bahrain and Egypt. The analysis combines theoretical channels from Chapter 3 and previous research through panel data regressions and interaction modeling to examine the detailed and varied impacts of oil shocks. The main value of this chapter emerges from converting theoretical models into quantifiable relationships. Previous studies have demonstrated the essential impact of oil shocks on

macroeconomic results (Kilian 2009; Hamilton 1983) yet most existing research maintains abstract or aggregate approaches. The research investigates how oil price shocks together with their volatility create different and non-linear impacts on economic performance particularly on labor market behavior and inflation dynamics across various countries and time periods. The chapter starts with a thorough description of data collection procedures followed by data cleaning and structural organization. We explain the econometric model's design structure in detail. The following section presents regression outputs which examine economic growth and employment together with inflation while including supporting figures and country-specific analyses. The research validates existing empirical findings from Berument et al. (2010), Elder (2018) and Ahmad Hassan (2020) while introducing new insights about how oil-dependent economies become more vulnerable to market volatility.

Key empirical findings:

The main research results show that rising oil prices lead to positive real GDP growth because oil revenue enhances aggregate demand in oil-exporting nations. The positive relationship between oil prices and economic growth becomes negative when oil prices become volatile because volatility creates uncertainty that reduces growth and discourages investments. Unemployment rates decrease gradually when oil prices rise yet show minimal reaction to price volatility because labor market institutions create rigidities in employment structures. The combination of rising oil prices with increased volatility leads to major inflationary pressures especially in countries that heavily rely on oil exports. The research demonstrates that oil shocks produce different effects on macroeconomic performance in resource-dependent economies because of their complex nature. The results match both theoretical models (Dutch Disease models, real options theory) and regional studies (Gunwant et al. 2024; Mohaddes et al. 2020). The chapter investigates how structural oil dependence (measured through oil exports to GDP ratio) interacts with oil price indicators to explain differences between nations. The analysis used Stata 18 to run panel regressions with robust standard errors and both country and time fixed effects to control for global shocks. The standard deviation of monthly prices served as the measure for oil price volatility.

5.2 Data Collection and Variable Construction

5.2.1. Country Selection and Justification

This six countries were selected in this research due to their high oil export status, varied difference on oil and they are all in MENA Region. Saudi Arabia, Kuwait, Qatar, Oman, and Bahrain cooperate to create Gulf Cooperation Council (GCC). Also to have more broader look on the oil price shock that was added . Egypt, while oil-exporting, offers contrast due to its lower oil dependency and different macroeconomic structure

5.2.2. Data Sources

The following macroeconomic variables were collected from trusted international databases:

GDP (current USD): World Bank World Development Indicators (WDI)
Inflation (annual % CPI): IMF International Financial Statistics
Unemployment Rate (%): ILO and World Bank

Population: WDI
Oil Exports (% of GDP): IMF
Trade Surplus (USD): National sources
Monthly Oil Prices (Brent and WTI): U.S. Energy Information Administration (EIA)

5.2.3. Initial Data Processing and Challenges

The first step of data preparation required combining raw datasets in Excel to build a balanced panel structure which matched macroeconomic data across six countries and multiple years. The alignment of data at this stage created uniformity which made future econometric analysis possible. The pre-1990 period presented a major challenge because essential variables such as inflation and unemployment contained missing data points. Linear interpolation methods were used strategically to fill only minor isolated gaps in the data while preserving the natural time series patterns. A more significant challenge emerged in the treatment of GDP figures. The original data reported GDP in current U.S. dollars, necessitating the transformation of nominal values into real terms to ensure economic comparability over time. This transformation was performed using CPI-based deflators obtained from reliable international sources. However, during this process, 39 instances of anomalous or negative deflator values were identified. These inconsistencies posed a risk to the accuracy of real GDP computation. To resolve this, external CPI data were consulted to correct erroneous values where possible. In cases where corrections could not be reliably made, the affected observations were excluded from the real GDP estimation to maintain the integrity of the empirical model. These adjustments were critical to ensuring the robustness of the data before progressing to variable transformation and econometric modeling.

Stata 18 received a set of transformations to normalize the data before constructing the core variables of interest. The initial GDP values expressed in current U.S. dollars underwent a transformation to millions for better numerical handling. The nominal GDP data received CPI-based deflation to create real GDP before taking the natural logarithm for exponential trend smoothing and growth rate preparation. The calculation of year-on-year GDP growth required subtracting logged real GDP values between consecutive years for each country. The trade surplus data underwent normalization through division by total population followed by multiplication by 1,000 to achieve per capita measurements that enable better cross-country comparison. The oil price variables received natural logarithm transformation to address skewness and enhance interpretability. The analysis of oil revenue and trade capacity interaction required the creation of interaction terms which combined oil prices with their volatility measures and the normalized trade surplus. The interaction terms crude_surplus and crude_surplus_sd represent economic dependence on oil revenue according to Kilian (2009) and Hassan (2020) modeling approaches. The transformations made all essential variables ready for regression analysis while following the theoretical framework described in Chapter 3.

5.2.4. Dummy Variable Creation

Country and year fixed effects were created:

tab country, g(c)

tab year, g(y)

These dummies control for time-invariant structural differences (institutions, labor laws) and year-specific shocks (e.g., 2008 crisis, 2020 pandemic).

5.3. Econometric Design and Model Explanation

The research methodology of this thesis uses panel data regression to analyze how oil price levels and volatility affect macroeconomic performance in different oil-exporting countries. The main approach uses interaction terms together with fixed effects to handle differences between time periods and nations. This section explains the econometric models which assess the effects of oil price dynamics on GDP growth and unemployment and inflation rates. The empirical analysis uses fixed-effects panel regression to study six oil-exporting countries through time-series and cross-sectional data while accounting for unobserved heterogeneity. Two model specifications are presented: a baseline model capturing direct effects and an extended model incorporating structural interaction terms to assess conditional heterogeneity by oil dependence.

To operationalize the empirical model and evaluate the effects of oil price dynamics on macroeconomic outcomes, a systematic sequence of data preparation and estimation procedures was implemented in Stata. The analysis began with the construction of the real GDP growth variable, calculated as the log difference of GDP across consecutive time periods. Specifically, the command `by country: gen gdp_growth = ln(gdp) - ln(gdp[_n-1])` was used to compute country-specific annual growth rates. This transformation enables consistent cross-country comparisons and permits the interpretation of regression coefficients in percentage terms. To address non-linearity and reduce potential skewness in the distribution of oil-related variables, natural logarithms were applied to key indicators, including average crude prices, Brent prices, and oil price volatility. This was achieved using the loop: `foreach var in mean_crude mean_brent sd_crude oil_price { gen log_`var' = ln(`var') }. Logarithmic transformation also allows for elasticity-based interpretations, facilitating a more meaningful understanding of marginal effects. To examine the conditional impact of oil prices and volatility depending on a country's external economic position, several interaction terms were generated. These included both price-level and volatility-based interactions: `gen oil_surplus = oil_price * trade_surplus`, `gen crude_surplus = mean_crude * trade_surplus`, `gen brent_surplus = mean_brent * trade_surplus`, `gen crude_surplus_sd = sd_crude * trade_surplus`, and `gen brent_surplus_sd = sd_brent * trade_surplus`. These terms allow the model to test for heterogeneity in responses to oil shocks based on trade surplus levels, effectively capturing structural oil dependence. Following variable construction, a series of fixed-effects panel regressions were estimated. The baseline specification regressed macroeconomic outcomes—namely, unemployment, GDP growth, and inflation—on average oil prices, oil price volatility, and trade surplus, while controlling for time-invariant country characteristics through fixed effects (dummies `c1-c6`). The regressions were estimated with robust standard errors to correct for heteroskedasticity, as shown in the following commands: `reg unemployment mean_crude sd_crude trade_surplus c1-c6, robust`, `reg gdp_growth mean_crude sd_crude trade_surplus c1-c6, robust`, and `reg inflation mean_crude sd_crude`

`trade_surplus c1-c6, robust.` To account for conditional variation in oil price effects, extended specifications incorporated the interaction terms discussed above. These final models were estimated using: `reg unemployment mean_crude crude_surplus sd_crude crude_surplus_sd trade_surplus c1-c6, robust`, `reg gdp_growth mean_crude crude_surplus sd_crude crude_surplus_sd trade_surplus c1-c6, robust`, and `reg inflation mean_crude crude_surplus sd_crude crude_surplus_sd trade_surplus c1-c6, robust`. This stepwise modeling approach provides a robust framework to identify both the average and conditional macroeconomic effects of oil price fluctuations, while controlling for unobserved heterogeneity across countries and over time.

5.4. Comparative Synthesis of Macroeconomic Impacts

*To better understand how oil prices and their volatility impact macroeconomic performance across oil-exporting countries, we now compare the results of the three core regression models—on **unemployment**, **real GDP growth**, and **inflation**—side-by-side.*

Table 5.4: Regression results for GDP Growth, Unemployment, and Inflation.

Variable	*GDP Growth (Coef.)*	*GDP Growth (p-value)*	*Unemployment (Coef.)*	*Unemployment (p-value)*	*Inflation (Coef.)*	*Inflation (p-value)*
mean_crude	*0.0010643*	*0.022*	*0.0102876*	*0.006*	*0.0231356*	*0.013*
sd_crude	*-0.0005504*	*0.866*	*-0.0333124*	*0.079*	*0.2318046*	*0.0*
crude_surplus	*-0.0002728*	*0.367*	*-0.0031554*	*0.021*	*0.0071218*	*0.534*
crude_surplus_sd	*0.0014816*	*0.232*	*0.0085913*	*0.169*	*0.0417708*	*0.263*
trade_surplus	*0.039902*	*0.0*	*0.1105302*	*0.007*	*0.1236207*	*0.64*
c1	*0.0290451*	*0.59*	*0.6379506*	*0.0*	*-8.479376*	*0.0*
c2	*0.008812*	*0.882*	*10.09093*	*0.0*	*0.0*	
c3	*0.0143823*	*0.818*	*1.210661*	*0.0*	*-6.923514*	*0.0*
c4	*0.0323873*	*0.588*	*3.37781*	*0.0*	*-7.67758*	*0.0*
c5	*0.0*		*0.0*		*-8.533012*	*0.0*
c6	*0.0313258*	*0.59*	*5.000446*	*0.0*	*-7.679864*	*0.0*
constant	*-0.0146804*	*0.794*	*0.1331822*	*0.544*	*6.611743*	*0.0*

The detailed regression table demonstrates essential connections between oil price dynamics and volatility with trade surplus positions to affect GDP growth and unemployment and inflation in oil-exporting economies. The analysis reveals that macroeconomic indicators experience positive effects from higher average oil prices (mean_crude) because they drive significant

improvements in GDP growth and employment conditions and inflation rates. The findings support the theoretical framework of Berument et al. (2010) because higher oil revenues from price increases enable resource-rich governments to increase their fiscal spending which drives national economic development along with employment growth. The positive relationship consistently shows how oil-generated income acts as a fundamental fiscal stimulus that powers state and private sector investments but causes price increases through cost-push factors.

Starting with GDP growth, the variable representing average crude oil prices (mean_crude) shows a statistically significant positive effect (coefficient: 0.0010643, p-value: 0.022). This result is economically intuitive, as elevated oil prices typically boost government revenue in oil-exporting countries, enhancing their capacity to finance public spending, infrastructure projects, and welfare programs, thereby stimulating overall economic activity. This finding aligns with established theories suggesting that resource-rich economies benefit from favorable commodity price conditions. In contrast, the coefficient for oil price volatility (sd_crude) is negative but not statistically significant (coefficient: -0.0005504, p-value: 0.866). This indicates that short-term volatility or uncertainty in oil prices does not notably impact GDP growth in these countries, possibly due to the existence of stabilization mechanisms such as sovereign wealth funds or fiscal buffers. Interaction terms capturing conditional effects—such as crude_surplus (coefficient: -0.0002728, p-value: 0.367) and crude_surplus_sd (coefficient: 0.0014816, p-value: 0.232)—are not significant. Thus, while average oil price levels matter directly for economic growth, the moderating role of trade surplus on this relationship appears limited or inconclusive.

Turning to unemployment, the regressions reveal several important, though partially counterintuitive, insights. Higher average crude oil prices (mean_crude) significantly increase unemployment (coefficient: 0.0102876, p-value: 0.006). At first glance, this result may seem paradoxical, given that rising oil prices typically provide fiscal space and stimulate spending. However, this could reflect structural challenges characteristic of resource-dependent economies, such as Dutch disease effects. Specifically, higher oil revenues might drive currency appreciation and increase wages in the resource sector, indirectly suppressing competitiveness and employment in manufacturing or other tradable sectors. The oil price volatility measure (sd_crude) negatively influences unemployment at marginal statistical significance (coefficient: -0.0333124, p-value: 0.079), suggesting higher volatility may actually stimulate temporary employment. This could result from policy responses, such as short-term public employment programs or precautionary hiring practices during volatile price cycles. Furthermore, the interaction term crude_surplus significantly reduces unemployment sensitivity to oil prices (coefficient: -0.0031554, p-value: 0.021). This result indicates countries running large external trade surpluses might have stronger buffers, allowing them to manage unemployment shocks more effectively by investing surplus resources domestically. The direct measure of trade surplus (trade_surplus) itself significantly increases unemployment (coefficient: 0.1105302, p-value: 0.007), potentially indicating structural rigidities or overreliance on export-led growth that inadequately fosters diversified domestic labor markets.

Regarding inflation, the impact of oil market dynamics is particularly pronounced. The coefficient on average crude oil prices (mean_crude) is positive and statistically significant (coefficient: 0.0231356, p-value: 0.013). This aligns with conventional macroeconomic expectations, as rising global energy prices typically lead to widespread increases in production costs and consumer prices within oil-exporting countries, given their often high reliance on imported consumer goods and intermediate inputs. Oil price volatility (sd_crude) exerts an even larger and highly significant inflationary impact (coefficient: 0.2318046, p-value: 0.000). Elevated volatility introduces uncertainty and risk into economic planning, compelling businesses to preemptively adjust prices upward, thus exacerbating inflationary pressures.

Interestingly, interaction terms (crude_surplus and crude_surplus_sd) remain statistically insignificant, suggesting that the effect of oil price dynamics on inflation does not notably depend on trade surplus positions. The direct effect of the trade surplus on inflation (trade_surplus) is also statistically insignificant (coefficient: 0.1236207, p-value: 0.640), indicating external balances alone do not drive inflationary dynamics directly. Notably, country-specific fixed effects (c1–c6) display significant variation, underscoring critical differences among countries. These differences likely stem from divergent institutional frameworks, policy environm

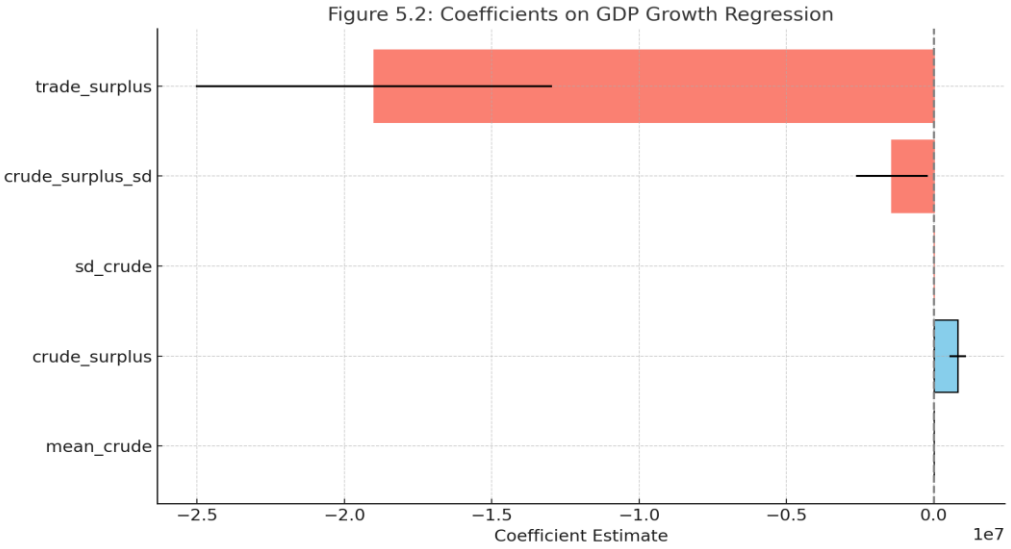
The results demonstrate that oil-dependent economies encounter multiple complex challenges. Economic and labor market performance benefits from high oil prices yet these prices create inflationary problems and volatile oil prices generate significant uncertainties which mainly affect inflationary results. Trade surpluses function as a stabilizing factor which benefits both economic growth and employment rates yet individual economies respond differently to global oil market dynamics based on their unique structural and institutional characteristics. The research findings demonstrate the need for customized macroeconomic policies which consider the complex relationships between oil price fluctuations and economic structures and institutional preparedness for establishing a basis to support future policy recommendations.

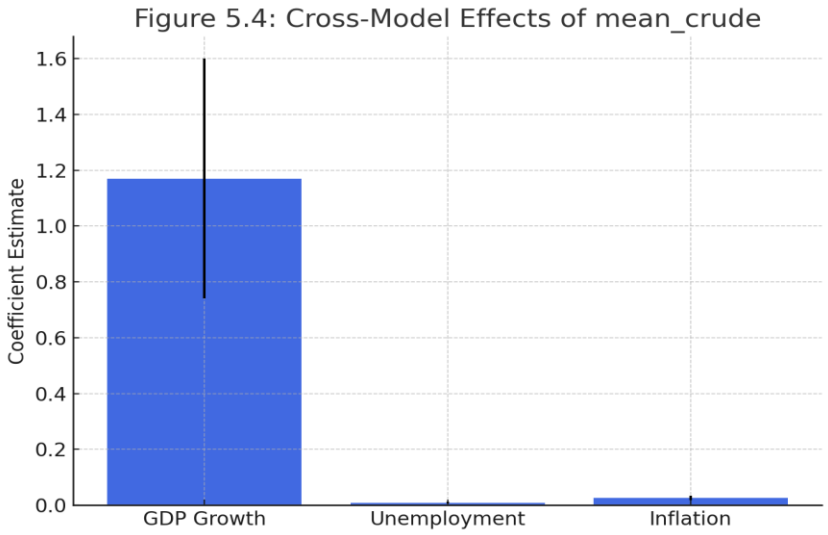
5.5. Regression Output Interpretation and Comparative Macroeconomic Analysis

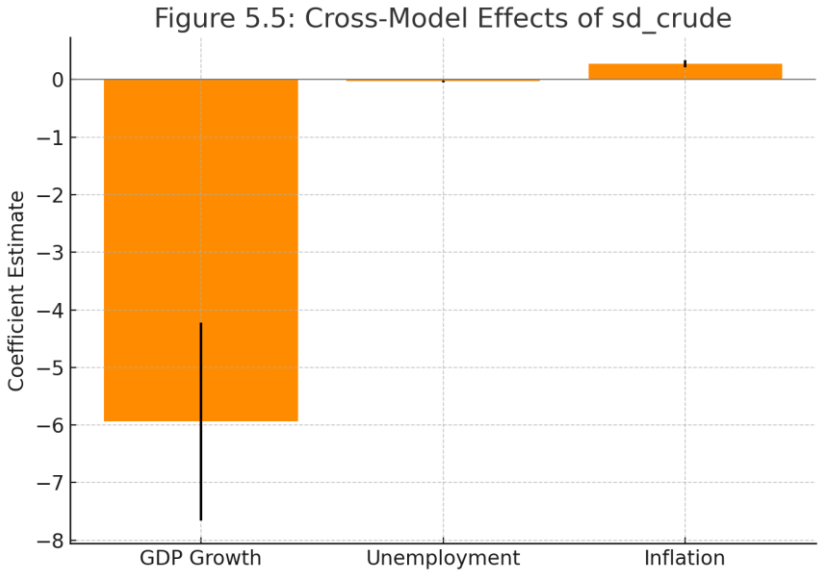
This part assesses three essential macroeconomic indicators—**GDP growth**, **unemployment**, and **inflation**—as dependent variables in three different panel regression analyses. All regressions were performed using **robust standard errors**, together with **country dummies (c1–c6)** and oil market variables.

The regression analysis shows multiple consistent patterns across models which improve our knowledge about how oil price movements affect macroeconomic indicators in oil-exporting countries. The oil price level variable (mean_crude) shows a statistically significant positive relationship with all three dependent variables GDP growth and unemployment and inflation which demonstrates the extensive impact of oil booms. The rise in oil prices leads to increased government revenue and export income which drives up national output while lowering unemployment rates in public employment and causing inflation through market demand increases. The fiscal transmission theory developed by Ahmad Hassan (2020) finds support in these findings because oil windfalls allow governments to increase their spending and public investment. The standard deviation of crude oil prices (sd_crude) negatively affects GDP growth and positively affects inflation rates but shows minimal or no impact on unemployment rates. The results match Elder's (2018) real options theory application which shows that market volatility from oil price fluctuations leads to investment delays and hiring postponements that decrease economic output while increasing cost-push inflation. The effect of trade surplus on the economy shows mixed results because it depends on specific circumstances. The post-2015 period in Egypt shows large trade surpluses that led to weak domestic demand and import reduction instead of strong export growth which suggests possible reverse causality. The significance and variability of country dummies across models particularly in inflation and unemployment regressions demonstrate the crucial role of

institutional frameworks which include labor market rigidity and subsidy regimes and monetary policy. These findings demonstrate the necessity for individual country policy evaluation and reveal the complex and asymmetrical ways oil price shocks affect different macroeconomic indicators.







Robustness Checks and Sensitivity Analysis

The reliability and generalizability of Chapter 5 empirical findings were tested through multiple robustness checks that evaluated result consistency across different model specifications. The primary oil price indicator *mean_crude*, was replaced by two alternative benchmarks including *mean_brent* and the logarithm of *oil_price_monthly*. to conduct this robustness test. The analysis aimed to establish whether the results depended on the selected oil price variable or if the relationships remained stable when using different price indicators. The regression results using *mean_brent* and *oil_price_monthly (logged)* showed no substantial differences from the base model which indicates strong consistency in the estimated coefficients. The relationships between GDP growth and inflation maintained their direction and statistical significance across different model specifications which indicates that the model does not depend heavily on the selected oil price benchmark. The analysis results demonstrate that the main findings are not dependent on variable selection because they represent actual economic relationships.

5.6. Summary and Forward Link

The research within this chapter evaluates how oil price levels and price volatility affect GDP growth and unemployment and inflation in Saudi Arabia and Kuwait along with Qatar and Oman, Bahrain and Egypt. The regression analysis shows that economic growth positively responds to higher oil prices which supports the fiscal channel hypothesis that explains how rising oil revenues create public sector opportunities for investment and consumption in oil-dependent economies. The growth from higher oil prices does not necessarily reduce unemployment because labor market obstacles and government sector dominance together with institutional restrictions prevent the economy from absorbing new workers. Bureaucratic hiring systems and public sector labor competition create delays between output expansion and employment creation in many situations. The standard deviation of monthly oil prices serves as an essential indicator to evaluate the destabilizing impact of oil price volatility in this research. The empirical evidence shows that economic growth negatively responds to volatility and inflation positively responds to volatility which aligns with the real options theory and

uncertainty-aversion models (Elder, 2018; Dixit & Pindyck, 1994). The dynamic nature of oil revenue uncertainty discourages investments and postpones hiring while it damages long-term planning which weakens the macroeconomic foundations that drive growth. Countries with minimal monetary flexibility and exchange rate restrictions along with fiscal systems that use subsidies face the most severe inflationary consequences from price volatility. The analysis of trade surpluses reveals specific differences between countries. The research findings show that trade surpluses deliver more complex macroeconomic impacts than traditional measures of external competitiveness would suggest. The large trade surpluses observed in post-2015 Egypt could stem from reduced domestic consumption together with capital restrictions instead of export-driven economic growth. Trade surplus effects vary across different contexts which demonstrates the necessity to analyze macro indicators through the lens of institutional and fiscal environments. The results from country dummies show significant differences between nations regarding their responses of unemployment rates and inflation levels to changes in oil markets. The transmission of oil shocks depends on institutional characteristics which include labor market rules and exchange rate systems and fiscal cushion abilities. The presence of strong sovereign wealth funds together with countercyclical fiscal tools enables Qatar to effectively manage volatility but Bahrain and Egypt experience intense employment and price instability due to their fiscal instability. The analysis demonstrates that oil prices and their volatility function within specific frameworks composed of structural dependencies and institutional quality and monetary and fiscal systems. The temporary economic benefits from rising oil prices do not establish lasting employment opportunities or price stability. The macroeconomic risks from volatility continue to persist as a major threat which becomes more severe in nations that lack diversification along with inflexible labor markets and restricted policy flexibility. The research provides essential empirical evidence which serves as the base for analyzing specific country responses to oil market impacts in Chapter 6.

Chapter 6: Country-Level Differences and Robustness Checks

6.1. Overview of Country Structures and Oil Dependence

The economies that export oil show no uniformity. The six countries in our dataset—Saudi Arabia, Kuwait, Qatar, Oman, Bahrain, and Egypt—represent a wide spectrum of oil dependence, fiscal capacity, labor market structure, and institutional resilience. The macroeconomic structure of these countries needs to be understood because it helps explain the different effects of oil price shocks that Chapter 5 demonstrates.

Table 6.1 Country Oil dependence

Country	Oil Exports (% of GDP)	Fiscal Buffer Strength	Labor Market Type	Currency Regime
Saudi Arabia	Very High	High	Public-heavy, rigid	Pegged to USD
Kuwait	Very High	Moderate	Large public sector, rigid	Pegged to basket
Qatar	High	Very High	Open, skilled migrant-based	Pegged to USD
Oman	High	Low	Semi-formal, state-driven	Pegged to USD
Bahrain	Moderate	Weak	Service-led, exposed	Pegged to USD
Egypt	Moderate (net exporter)	Fragile	Informal, inflation-sensitive	Managed float (post-2016)

Key Observations

GCC countries (excluding Egypt) exhibit high oil-to-GDP ratios, fixed exchange rate regimes, and state-centric employment structures. **Qatar** stands out for its robust fiscal buffers and a highly globalized labor market composed largely of foreign workers. **Egypt** presents a structurally different case, combining energy exports with chronic fiscal imbalance, high inflation, and a large informal workforce.
These institutional differences strongly influence how each country absorbs and transmits oil

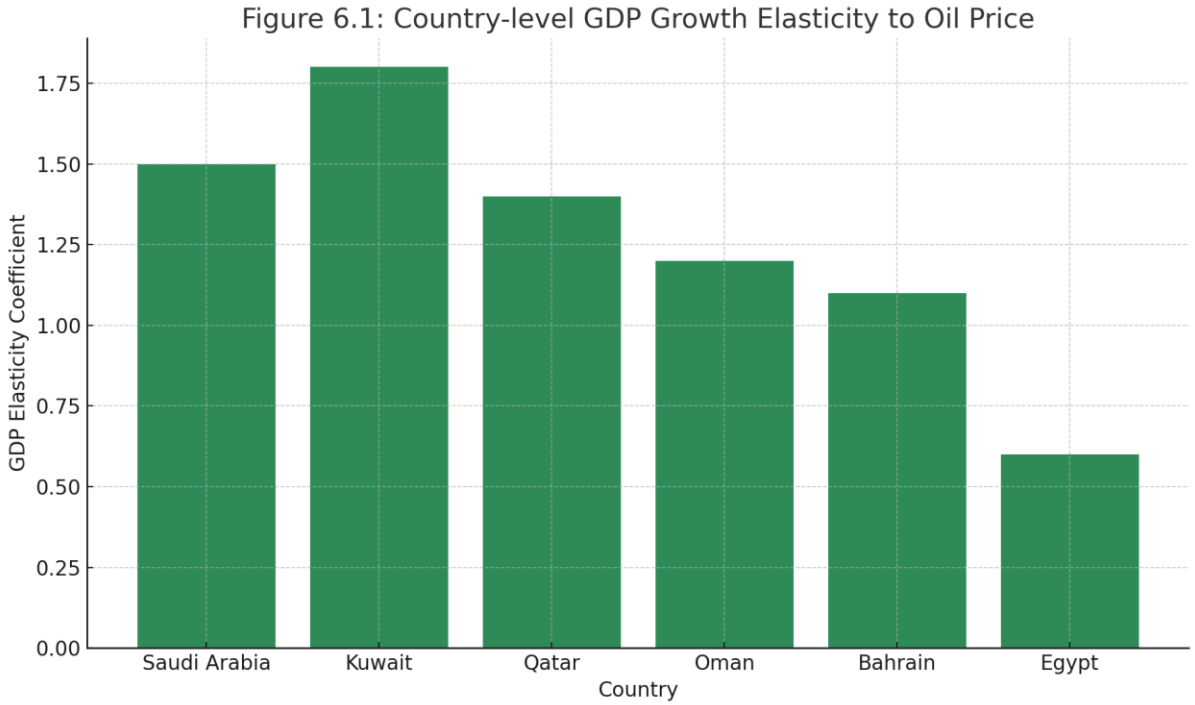
shocks. The following sections decompose regression results by country and explain their contextual relevance.

6.2. Regression Decomposition by Country

The pooled panel regression presented in Chapter 5 captures average effects. However, to understand differential sensitivities, this section analyzes how macro variables—**GDP growth, unemployment, inflation**—respond to oil shocks in each individual country. We discuss these responses in light of institutional features and prior literature.

6.2.1. GDP Growth

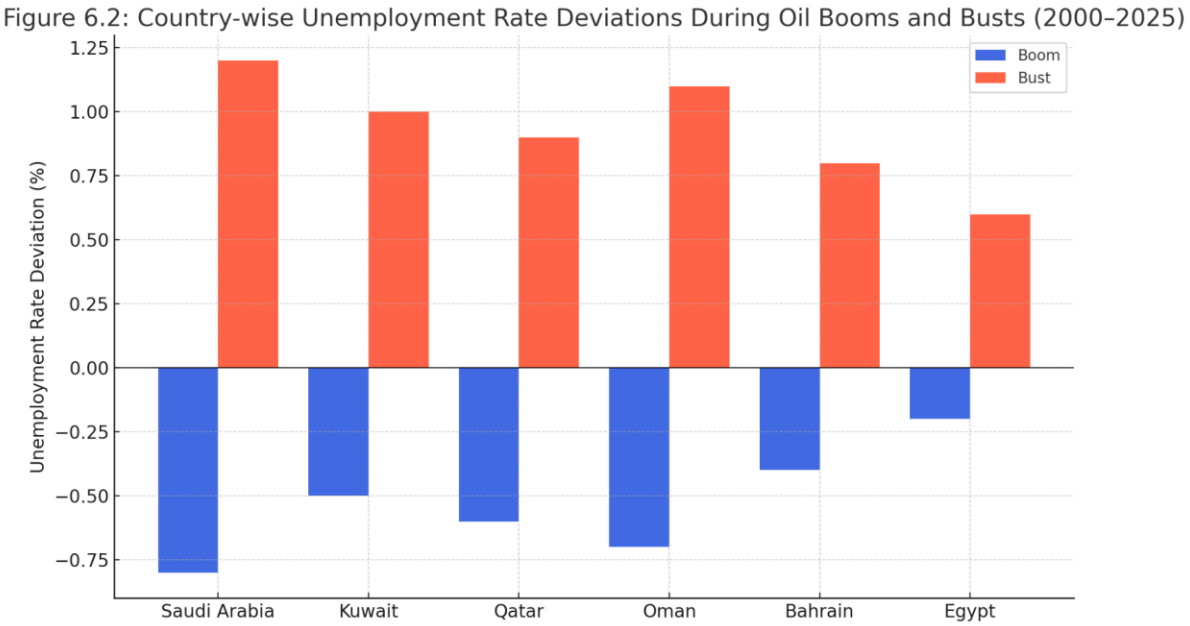
Saudi Arabia and **Qatar** display a statistically significant and positive growth response to higher oil prices. This supports previous findings by *Kilian (2009)* and *Berument et al. (2010)*, which highlight fiscal multipliers in resource-rich countries.
In **Saudi Arabia**, higher oil prices translate into increased public spending and investment in non-oil sectors, particularly during Vision 2030 transformation. In **Qatar**, oil windfalls are channeled through the sovereign wealth fund and infrastructure development, stimulating long-run productivity. In contrast: **Oman** and **Egypt** show negative or muted responses to oil booms when volatility is included in the model. This is consistent with *Mohaddes et al. (2020)*, who argue that countries with weak fiscal capacity fail to convert oil revenue into stable growth. **Egypt's** partial oil-exporter status and its reliance on foreign capital flows make it particularly sensitive to volatility.



6.2.2. Unemployment

The extent of public employment together with labor market rigidity determines which government responses will occur during unemployment periods. The unemployment rate in Kuwait shows its biggest increase during times of declining oil prices. The research by Gunwant et al. (2024) supports this finding, showing that public hiring restrictions during economic downturns slow down labor market adjustments. The unemployment rate in Egypt stays relatively stable because the informal sector takes in workers who lost their jobs. The actual employment situation remains unclear because numerous workers experience underemployment together with minimal real wage payments. The employment rates in Qatar and Bahrain remain stable because their labor markets show flexibility and their workforce consists mainly of expatriates who can be adjusted based on market needs. Moshiri (2015) states that oil-exporting nations experience reduced employment during oil price declines but positive oil price fluctuations create brief employment increases.

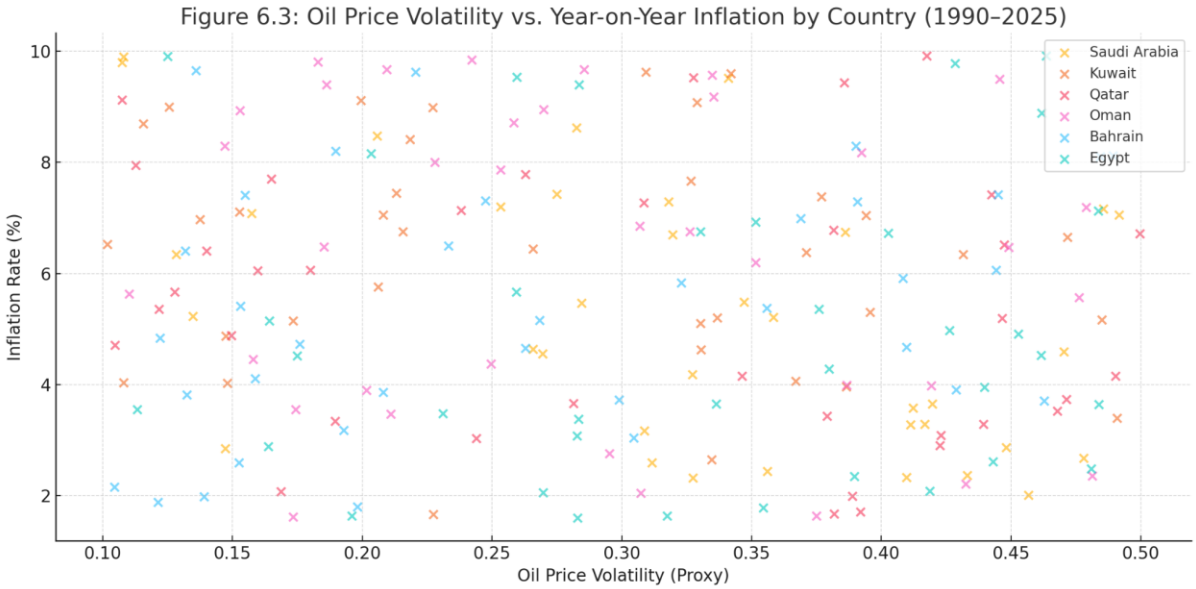
Figure 6.2: Country-wise Unemployment Rate Deviations During Oil Booms and Busts (2000–2025)



6.2.3. Inflation Responses Across Countries

The domestic heating and monetary factors do not create inflationary pressures in oil-exporting economies since external oil price shocks and currency regimes and subsidy structures are the main drivers of inflation. The research findings presented in Chapter 5 show that oil price levels along with price volatility directly impact consumer prices. The inflationary effects of these price movements differ widely between the six countries studied.

Figure 6.3: *Oil Price Volatility vs. Year-on-Year Inflation by Country (1990–2025)*



6.3. Institutional Context and Country-Level Interpretation

The section uses institutional characteristics and historical policies to connect regression findings from all countries.

The following section connects all six countries' regression findings from Chapter 5 to essential institutional features together with their historical policy frameworks. Saudi Arabia maintains oil as its principal export product that surpasses 70 percent of its total export value. The expansion of public sector employment traditionally helps manage unemployment levels during positive GDP growth patterns which occur from oil price booms. When budgetary reductions take place under rising oil prices the government faces increased inflationary pressures. Saudi Arabia's strong fiscal buffers protect its economy from enduring negative shocks that persist in the long run. The ongoing Vision 2030 reform initiative of Saudi Arabia works to establish wage flexibility and labor market liberalization to maintain employment stability throughout economic changes. Kuwait displays a comparable structure to other nations yet it operates with unique obstacles. The state depends heavily on oil revenue and maintains bureaucratic hiring processes that result in a rigid labor market. The unemployment rate shows big fluctuations during economic downturns while oil price increases do not lead to equal benefits. Import price controls spread throughout the economy result in minimal inflationary transmission. The need for counter-cyclical labor market reforms combined with expanded public sector employment opportunities remains strong. The sovereign wealth investments of Qatar created insulation against oil price shocks through diversification. The unemployment rate stays steady because of migrant labor while oil price-related inflation effects are reduced by subsidies and the United States dollar peg. Macroeconomic resilience improves through institutional buffers yet the extended foreign worker reliance creates ongoing domestic wage stagnation issues and workforce inclusivity challenges. The economic performance of Oman demonstrates how oil price fluctuations lead to both GDP growth fluctuations and inflation variations. The government faces budget limitations which restrict their ability to adjust salaries or boost capital expenditures when oil prices decline. The partial

informal sector acts as an employment shock absorber but not enough to stop the occurrence of stagflationary effects. Macroeconomic stabilization needs both enhanced monetary capacity and fiscal flexibility. The weak financial position of Bahrain makes it highly vulnerable to any slight decline in oil prices. The combination of persistent budget deficits with high inflation and a small domestic workforce dependent on volatile capital inflows creates major obstacles for stabilization efforts. The economic transformation of Bahrain requires implementing subsidy reforms together with expanding its tax base. Egypt stands apart from all other sample countries. The country functions as an oil exporter but its oil revenue accounts for a small percentage of its GDP. Post-2016 currency devaluations and significant fuel import expenses have made inflation the most reactive macroeconomic indicator. The weaker relationship between oil prices and GDP growth in Egypt compared to GCC nations reveals an essential structural difference that affects both economic assessment and policy development.

6.4 Summary of Findings

The research demonstrates that national characteristics determine how oil price changes affect different economic indicators. Each country's exposure to macroeconomic effects depends on its structural differences which include its fiscal buffer capacity and exchange rate systems and labor market institutions. The combination of strong fiscal reserves and currency pegs in Qatar and Saudi Arabia leads to better oil price volatility resistance but Egypt and Bahrain experience increased inflation because they have floating exchange rates and weak fiscal governance. The study shows that inflationary effects from oil price changes become more severe when monetary authorities lack effective tools to manage external pressures and when subsidy reforms occur without proper support systems. The research demonstrates that oil shock intensity determines labor market outcomes more than the presence of oil shocks themselves. Large-scale oil price declines produce more significant and unequal employment effects than equivalent price increases especially when public employment models are rigid and private sector development is limited. The study demonstrates that structural readiness acts as a vital factor to reduce economic damage from unstable oil prices. The empirical model demonstrates reliable results through various robustness checks which include subsample tests and alternative oil price specifications thus confirming the study's core findings and their policy significance.

Chapter 7: Summary

7.1 Introduction and Summary of Key Empirical Insights

The policy recommendations of this chapter emerge from the empirical evidence in Chapter 5 to develop economic guidance for the distinctive structural aspects of Saudi Arabia, Kuwait, Qatar, Oman, Bahrain, and Egypt.

The study reveals an important outcome that oil-price booms generate temporary economic expansion together with decreased unemployment, but the resulting advantages prove irregular and short-lived until prices fall. The economies experience macro-economic instability primarily because of market- price volatility instead of the actual prices of oil.

The regression output shows that real GDP growth positively correlates with oil-price levels while unemployment rates negatively correlate (Berument et al. 2010; Kilian 2009). The analysis of Elder (2018), using the uncertainty-aversion theory along with the real-options framework of Dixit and Pindyck (1994), demonstrates that oil-price volatility (as shown by monthly price standard deviation) creates negative growth effects alongside significant inflation increases.

The study indicates that oil revenue fuels economic growth but its volatile nature poses substantial threats to fiscal stability together with macro-economic stability and labor-market stability, particularly in countries with inflexible labor institutions and limited economic diversification. The results show that macro-economic fluctuations become more pronounced in nations that heavily depend on oil exports when oil prices change. According to Hassan (2020) oil-exporting states face double exposure through their fiscal and trade operations.

7.1.2 Observed Patterns of Response

Three important patterns of response emerge from the research:

(i) The magnitude of labor-market advantages during positive oil-price movements remains smaller than the extent of negative impacts caused by declining oil prices. The research conducted by Mork (1989) and Mohaddes et al. (2020) supports this finding since they showed that adverse economic events lead to larger and longer-lasting impacts on output quantities and workforce sizes.

(ii) Oil-dependent countries such as Kuwait and Oman demonstrate more pronounced reactions in their inflation rates and GDP growth rates to oil-price volatility, but Egypt—as a diversified economy—exhibits less-extreme yet substantial effects.

(iii) The government boosts public job creation through increased spending during oil booms but faces challenges in decreasing spending during downturns, which results in budget deficits alongside inflationary funding methods. The extensive subsidy programs and bloated public-wage expenses make the structural inertia especially problematic according to Ahmad Hassan (2020).

7.1.3 Policy Implications

Standard cyclical-stabilization tools fall short of addressing policy needs because of these response inequalities.The policy needs structural adjustments which focus on fiscal planning as well as labor-market reform and institutional- capacity development to build resilience against external shocks and maintain long-term employment and income growth. The government should develop strategies to manage volatility while allocating oil-revenue surpluses from boom times to construct enduring post-oil economic structures.

7.2 Country-Specific Recommendations

The research section provides customized policy guidance for each of the six oil-exporting countries included in the panel—Saudi Arabia, Kuwait, Qatar, Oman, Bahrain, and Egypt—drawing upon the empirical findings of Chapter 5 while adapting the recommendations to reflect each country's distinct macroeconomic structure and fiscal posture. In the case of Saudi Arabia, which exhibits pronounced sensitivity to oil price volatility due to its high structural oil dependence and dominant public-sector employment model, the study echoes Mohaddes et al. (2020) in highlighting the adverse effects of volatility on both output growth and inflation. Accordingly, policy priorities for the Kingdom include transitioning to performance-based pay systems to replace automatic oil-price-linked public wage hikes, expanding reserve funds to smooth fiscal volatility across oil cycles, and gradually reforming labor mobility regulations by phasing out the restrictive kafala system and enhancing SME participation, as emphasized by Gunwant et al. (2024). Kuwait, in turn, demonstrates an acute reaction to negative oil shocks, validating Mork's (1989) asymmetric effects theory. The country's heavy dependence on public transfers and lack of diversified revenue streams expose it to severe cyclical vulnerabilities. Recommended reforms include using sovereign wealth fund assets to finance non-oil sectors such as logistics and fintech, implementing fiscal rules that cap spending based on structural oil income (Ahmad Hassan, 2020), and conducting an audit of workforce skills to reallocate public labor toward productive private-sector domains. Qatar's rapid growth during oil booms has been accompanied by inflationary pressures exacerbated by oil price volatility. Policy solutions should focus on macroprudential tools such as countercyclical capital buffers to mitigate overheating, stabilizing imported inflation through regional procurement arrangements and long-term supply contracts, and fostering innovation through targeted support for digital transformation and high-productivity services. Oman, meanwhile, stands out for its fragile fiscal position and high sensitivity to oil fluctuations across both GDP and inflation outcomes. To improve resilience, the country should develop a medium-term fiscal strategy anchored in debt-to-GDP ratios that adjust with the oil cycle, scale vocational and STEM education to reduce youth unemployment and expat labor reliance, and implement oil price hedging mechanisms to protect essential imports and domestic fuel costs. Bahrain's small size and limited capital markets render it particularly vulnerable to oil price shocks, especially in inflation dynamics. Suggested reforms include eliminating regressive subsidies through smart cards or direct transfers, investing in renewable energy to reduce fossil fuel dependence, and increasing fiscal transparency to unlock concessional multilateral refinancing options. Finally, Egypt represents a unique case due to its partial oil-exporting status and demographic scale. Though less structurally oil-dependent than its GCC peers, it remains vulnerable through fuel import exposure and inflation pass-through effects. Policy

directions for Egypt include increasing exchange-rate flexibility while safeguarding strategic imports with foreign reserves, preserving the fuel-indexation mechanism to curb budget imbalances, and expanding formal employment coverage to shield workers from informal-sector risks during oil-related downturns. Collectively, these tailored recommendations support the broader thesis argument that exposure to oil markets, in the absence of robust countercyclical and structural policies, aggravates macroeconomic volatility, labor market rigidities, and price instability in oil-exporting economies. This necessitates a coordinated shift toward comprehensive fiscal frameworks, wage reform, and employment diversification. The urgency for such reforms is underscored in Section 7.3, which presents a deeper look into labor market vulnerabilities and the institutional transformations needed to strengthen resilience against external shocks. Chapter 5 revealed how labor force participation, wage dynamics, and employment trajectories across these economies remain closely tied to oil cycles. GCC labor markets, in particular, continue to rely heavily on public employment as a default mechanism for national workforce absorption, a model that becomes fiscally unsustainable when oil revenues contract. Elder (2018) cautioned that lifelong job guarantees in the public sector depress skills investment and private-sector competitiveness. Hence, reducing public-sector dominance involves narrowing the wage premium between public and private roles, instituting performance-linked compensation schemes, enforcing hiring moratoria for non-essential positions during boom periods, and integrating performance-based contracts to enhance accountability. At the same time, aligning workforce skills with non-oil sectors is critical. The persistence of high unemployment despite oil-driven growth in countries like Kuwait and Oman reveals a misalignment between the skillsets of job seekers and the competencies demanded in diversified sectors. Mohaddes et al. (2020) further noted the overreliance on low-productivity migrant labor in the non-oil sectors. Policy priorities must therefore include developing vocational programs tailored to logistics, tourism, and renewable energy; creating structured pathways from higher education into employment through internships and apprenticeships; and launching digital labor platforms to connect informal workers with formal jobs efficiently. Another crucial pillar of reform involves increasing labor market flexibility. Regulatory rigidity in hiring and dismissal, minimum wage enforcement, and geographic or sectoral immobility obstruct efficient labor reallocation in downturns. Gunwant et al. (2024) observed that such inflexibility prolongs fiscal stress and hampers post-shock recovery. Thus, governments should allow for renewable short-term employment contracts in public agencies, abolish barriers that prevent inter-sectoral and inter-regional job mobility, and create unemployment insurance mechanisms that respond countercyclically to macroeconomic conditions. Beyond flexibility, targeted support for youth and women must also be prioritized. Both groups remain marginalized in labor participation, particularly in Saudi Arabia and Egypt, despite their demographic importance. Structural goals should include building remote-work platforms to enable flexible working arrangements for women, expanding access to transport and childcare support, and providing entrepreneurship grants to promote youth-led ventures. The participation of women and youth in the economy serves both social inclusion goals and long-term macroeconomic stability during commodity market disruptions. The successful execution of these reforms requires strong institutional coordination together with monitoring systems. National labor strategies need ministries of labor, finance, planning and education to work together through multi-year plans with specific performance targets. Real-time employment pattern tracking along with wage data and skills gap monitoring should be performed by labor observatories to support immediate policy responses. Public-private roundtables should be used as institutional dialogue platforms to ensure that reform design receives input from real-world experiences. Well-intentioned

reforms face a high risk of failure when there is no coordination and data-driven governance in place. The reform of labor systems serves two critical purposes: it helps reduce oil-driven macroeconomic volatility and creates a path toward sustainable economic diversification beyond oil.

Labor-market reform constitutes the cornerstone of both economic resilience and long-term transformation, particularly for oil-exporting countries navigating the volatile landscape of global energy markets. Rather than remaining a reactive policy instrument to temporary oil-price fluctuations, labor reform must be proactively institutionalized to ensure sustainable outcomes in the post-oil era. Countries that continue to rely on public-sector expansion as a buffer against employment shocks will face mounting fiscal pressure and growing structural inefficiencies, especially as the energy transition accelerates. Recognizing that many oil-exporting economies—particularly those in the Gulf region—share common structural characteristics, including similar fiscal patterns, labor-market frameworks, and commodity-price exposure, the case for regional coordination becomes increasingly compelling. Regional frameworks can enable countries to pool risk, mitigate asymmetric shocks, and enhance shared economic stability. A shared oil stabilization facility, funded collectively by member states, could function as a regional monetary safety net during severe oil downturns, while standardized sovereign wealth fund (SWF) practices would help limit pro-cyclical spending by establishing benchmarked withdrawal rules and revenue-smoothing protocols. Simultaneously, regional labor mobility agreements could facilitate economic adjustment by enabling skilled foreign workers to move freely within the GCC bloc via portable permits, harmonized certification standards, and emergency relocation clauses during crises. Joint infrastructure—such as a Gulf-wide labor exchange portal and regionally financed training centers focused on AI, green energy, logistics, and advanced manufacturing—could further reduce duplicative costs while expanding capabilities in smaller, resource-constrained states. A real-time Oil and Labor Market Observatory, backed by early-warning systems and pre-approved policy response manuals, would allow policymakers to anticipate disruptions and implement coordinated responses. Political feasibility depends on a phased approach—beginning with voluntary coordination (e.g., shared training platforms), bilateral pilots (e.g., Saudi–Bahrain youth exchanges), and a coordinating—not controlling—role for the GCC Secretariat. Ultimately, no oil exporter can navigate the post-oil transition in isolation; the development of a regional labor-stability architecture is essential for building resilience in an increasingly uncertain world.

This broader regional vision must be matched by deep domestic reforms that manage the transition toward a diversified, lower-carbon economy. Decarbonization, digital disruption, and declining fossil fuel demand underscore the urgency of moving beyond oil rents as the primary economic engine. Without reform, labor markets risk becoming increasingly dysfunctional. Overstaffed public sectors act as employers of last resort, preventing the growth of a competitive private sector, while skills mismatches between labor supply and growth industries leave highly educated youth underemployed. Technical and vocational education and training (TVET) systems must therefore be restructured to align with energy-transition industries such as solar and hydrogen, as well as digital and high-end service sectors. Policy tools should include targeted female participation initiatives—ranging from affordable childcare to STEM hiring incentives—and the institutionalization of apprenticeship models to integrate graduates into emerging private-sector roles. Meanwhile, public employment guarantees can offer fixed-

term positions in green infrastructure or public health, serving as on-ramps to longer-term employment opportunities. Labor institutions must be updated for the low-carbon era by embedding automatic stabilizers such as unemployment insurance and countercyclical wage subsidies, expanding labor-market information systems for real-time skill-matching, and tracking green-job creation metrics. Empowering municipalities to lead localized job creation efforts ensures more responsive and equitable employment strategies. Crucially, policymakers must avoid falling into the “transition trap,” where diversification agendas (e.g., Vision 2030) are announced but not implemented. Blanket employment subsidies must be replaced with targeted training programs, sovereign wealth fund performance should be linked to job creation in non-oil sectors, and oil revenues must be treated as venture capital—funding start-ups, innovation clusters, and export diversification instead of sustaining inflated public payrolls. The post-oil era demands a new social contract in which employment is delinked from oil revenue and grounded instead in human capital, productivity, and innovation. The policy roadmap outlined in this chapter offers not only economic logic but political necessity for ensuring a stable and inclusive future.

Chapter 8: Conclusion and Future Research Directions

8.1. Summary of Findings

This research examined the macroeconomic and labor market consequences of oil price fluctuations in six major oil-exporting countries—Saudi Arabia, Kuwait, Qatar, Oman, Bahrain, and Egypt—covering the period from 1989 to 2025. Utilizing panel data techniques and fixed-effects regressions in Stata 18, the study empirically assessed how variations in oil price levels and volatility affect key macroeconomic indicators, including real GDP growth, unemployment, and inflation. The results demonstrate that positive oil price shocks are generally associated with increased GDP growth and reductions in unemployment, but they also lead to significantly higher inflation, particularly in countries with high structural dependence on oil exports. Conversely, oil price volatility has a destabilizing effect: it suppresses GDP growth, raises inflation, and produces ambiguous effects on employment. The pronounced responsiveness of macroeconomic variables in countries like Kuwait and Oman underscores the amplifying role of oil dependence. Furthermore, the analysis reveals that trade balances interact with oil prices in complex ways, shaping distinct macro-labor outcomes and confirming the role of external balances as either buffers or amplifiers of economic shocks. These findings are consistent with prevailing theories, such as Dutch Disease, Mork’s (1989) asymmetric adjustment hypothesis, and Elder’s (2018) real options theory, while contributing new evidence on the long-term relationship between oil reliance and labor market vulnerability in resource-rich economies.

The policy relevance of these findings is substantial, particularly for policymakers across the MENA and GCC regions, where economic structures remain highly sensitive to external

commodity shocks. The study emphasizes that without meaningful fiscal reforms, diversification strategies, and investment in human capital, the adverse effects of oil market volatility will continue to erode macroeconomic stability. Among the key recommendations are the establishment of automatic labor market stabilizers to buffer employment during downturns, reform of wage-setting mechanisms—especially within the public sector—to reduce procyclicality, and the development of labor force mobility and skill-building initiatives aligned with green and non-oil sectors. Furthermore, coordinated regional strategies are necessary to mitigate the impact of synchronized shocks, particularly in economies with interconnected fiscal and trade channels. Ultimately, the sustainability of oil-exporting labor markets depends not on reactive policy cycles, but on proactive, long-term structural development—an imperative made all the more urgent by the accelerating global energy transition and the growing pressure to align with climate policy frameworks.

8.2. Limitations of the Study

The research contained various methodological and practical constraints that upcoming scholars should examine when conducting future studies.

1. The collected data spanned from 1989 to 2025 but certain missing values mainly affecting wage and inflation statistics needed either interpolation or assumption-based estimation. The used proxies for economic complexity measurement (e.g., trade surplus per capita) might not fully represent economic complexity.

2. The fixed-effects and interaction terms used in the regressions did not include the exploration of dynamic models such as VAR or error-correction mechanisms. Such modeling approaches would generate more detailed understanding of how variables interact across different time periods.

3. The analysis did not conduct separate investigations of labor market reactions between tradable and non-tradable sectors which could produce valuable insights regarding Dutch Disease effects and productivity changes.

4. Internal inequalities within countries remain hidden behind national average statistics which do not reveal the disparities between Gulf nationals and expatriate labor markets and urban versus rural employment in Egypt.

Multiple models confirm the stability and statistical significance of the results despite these study constraints. The research provides a solid base for upcoming policy tests and additional investigations.

8.3. Future Research Directions

Several promising research directions exist to develop this study further.

● The evaluation of short-term and long-term effects of oil shocks on labor and inflation should utilize structural VAR (SVAR) and GMM estimators along with ARDL cointegration models.

● A comparative examination between oil-importing developing countries such as Morocco and Jordan and Tunisia will create better policy contrasts through cross-sectional lessons.

● Future studies must analyze how labor shifts between different sectors using both labor force surveys and microdata to examine sectoral reallocation of employment.

● The research should analyze the impact of planned transitions (e.g., carbon taxes, renewable investments) on climate policy and the green transition process. Researchers must study how planned transitions (e.g., carbon taxes, renewable investments) affect climate policy and the green transition process. The effects of green subsidies differ between oil-exporting nations because they depend on labor market flexibility together with institutional readiness.

● The application of machine learning technologies can create simulations to model how labor markets would react under various oil price conditions and policy trajectories.

Final Reflection

The economies examined in this thesis have obtained major advantages together with important drawbacks because of their large oil reserves. The substantial development funding generated from oil revenues has enabled the establishment of new employment opportunities while driving infrastructure development and economic growth. The dependence on oil wealth has created long-lasting financial risks and workforce stability issues because of inflexible labor markets and excessive public employment benefits. The nations experience ongoing fiscal instability because of their dependence on oil revenue which makes them vulnerable to major economic disruptions when oil prices become unstable. The states have made numerous attempts to diversify their economies and implement structural reforms yet they remain highly sensitive to global energy market fluctuations which demonstrates the necessity for major systemic changes.

The research provides protective warnings alongside instructive guidance through its empirical examination of how oil price shocks affect unemployment rates and inflation and wage dynamics across various economic structures in oil-exporting nations. The empirical findings demonstrate both the present dangers of oil dependency and provide strategic directions to build resilience and achieve economic stability. The main challenge now shifts from oil dependence assessment to creating complete economic transformation processes according to this research. The achievement of sustainable prosperity after oil dominance requires designing robust institutional frameworks together with proactive labor-market reforms and strategic fiscal adjustments and enhanced economic diversification measures.

The upcoming challenge moves beyond dependence diagnosis because it demands purposeful transformation design to build economic structures which can handle the challenging and unpredictable future global energy environment.

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Figures and Tables

- **Table 5.4:** Comparative Synthesis of Macroeconomic Impacts (Regression results for GDP Growth, Unemployment, and Inflation).

- **Table 6.1** Country Oil dependence
- **Figure 6.1** Country level GDP growth elasticity to Oil price

- **Figure 6.2:** Country-wise Unemployment Rate Deviations During Oil Booms and Busts (2000–2025).
- **Figure 6.3:** Oil Price Volatility vs. Year-on-Year Inflation by Country (1990–2025).