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The Impact of Gold Price on Unemployment: A Case Study of Pakistan (2000–2024)

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Abstract

This study looks at the impact of gold prices on the unemployment rate in Pakistan using data from 2000 to 2024. By controlling for inflation, interest rates, and the official exchange rate, the study uses the Autoregressive Distributed Lag (ARDL) bounds testing approach to check both long-run and short-run movements. The results show that a long-run cointegration relationship exists among the variables. The findings suggest that gold prices significantly increase unemployment in the long run. This is likely because investors move their money from productive businesses to safe assets like gold.

Keywords: Gold Price, Unemployment, Pakistan, ARDL, Exchange Rate.

JEL Classification: E24, E44, G11, C22.

1 Introduction

Gold is not just a precious metal; it is also seen as a sign of how the world economy is doing and a way to store wealth. In developing countries, especially in South Asia, gold has two main roles: it is important for cultural ceremonies like weddings, and it acts as a financial ”safe haven” when the economy is unstable (Baur and McDermott, 2010). Pakistan faces frequent problems like rising prices (inflation), a falling currency value, and political uncertainty. Because of this, people and investors buy a lot of gold to protect the value of their money.

However, this obsession with gold affects the whole economy, not just individual wealth. The main idea of this study is based on the difference between ”dead capital” and productive investment. When too much money goes into non-productive assets like gold, it is taken away from industries and agriculture—the sectors that actually create jobs. In Pakistan, factories and service companies need local investment to grow and hire workers. If investors choose to lock their money in gold bars or jewelry because of fear and rising prices, the economy faces a shortage of cash in productive sectors. This can make unemployment worse.

The time from 2000 to 2024 has been very difficult for Pakistan’s economy. It saw the Global Financial Crisis of 2008, the COVID-19 pandemic, and serious balance of payment crises. During these years, gold prices went up very high, often moving in the opposite direction to the value of the Pakistani Rupee. At the same time, unemployment has remained a big problem, with a growing number of young people unable to find good jobs. While many studies have looked at the link between gold prices and things like inflation, exchange rates, and the stock market, very few have studied how gold price changes directly affect unemployment.

This study aims to fill this gap by analyzing the impact of gold prices on unemployment in Pakistan. Using the Autoregressive Distributed Lag (ARDL) approach, this research tries to find out if high gold prices stop productive investment, which then hurts job creation. Understanding this relationship is very important for policymakers. They need to find a balance between allowing people to protect their savings and making sure that money flows into businesses that create jobs.

The rest of this study is organized as follows: Section 2 outlines the theoretical framework and reviews past studies. Section 3 explains the data and the ARDL methodology used. Section 4 presents the results, including unit root tests, cointegration analysis, and short-run dynamics, followed by a discussion. Finally, Section 5 concludes the paper with policy suggestions and future research directions.

2 Literature Review and Theoretical Framework

The relationship between asset prices, economic instability, and unemployment has been discussed a lot in economic literature. This section first presents the theoretical framework underpinning the study and then reviews theories and evidence from global and Pakistani studies.

2.1 Theoretical Framework

The theoretical link between gold prices and unemployment can be explained through the Portfolio Choice Theory and the Crowding Out Effect. Investors allocate their wealth across a portfolio of assets, typically choosing between productive assets (like physical capital, machinery, or business equity) and non-productive assets (like gold or foreign currency). Ideally, money should flow into productive assets, which increases the demand for labor (L_d) and reduces unemployment.

However, in times of uncertainty or high inflation, the risk-adjusted return on productive capital decreases. Gold, acting as a ”safe haven” or a hedge against inflation, becomes more attractive. When investors shift their capital from the industrial sector to the gold market, it leads to a phenomenon known as ”investment diversion” or crowding out. A reduction in industrial investment leads to lower production capacity and, consequently, a lower demand for workers. Therefore, theoretically, a sustained rise in gold prices—reflecting economic distress—is expected to have a positive relationship with the unemployment rate.

2.2 Gold as a Safe Haven and Economic Indicator

Many studies show that gold acts as a shield against inflation and currency drops. Baur and Lucey (2010) and Baur and McDermott (2010) looked at gold’s role globally and concluded that gold is a ”safe haven” when stock markets crash or there is financial trouble. In Pakistan, Zakaria (2013) and Raza et al. (2016) confirmed that gold prices have a long-run relationship with inflation and exchange rates. Gold helps investors protect themselves when the Rupee loses value. This ”flight to safety” behavior means that when the economy is bad, money moves from risky productive assets (like stocks or business expansion) to safe assets (gold). Bernanke (1983) calls this the ”irreversibility of investment” when things are uncertain.

2.3 Determinants of Unemployment

Factors that cause unemployment in developing countries have been studied widely. The classic Phillips Curve suggests a trade-off between inflation and unemployment, though this is debated. In Pakistan, Chaudhry et al. (2012) and Maqbool et al. (2013) found that inflation, GDP growth, and foreign direct investment (FDI) are key factors for unemployment. They argued that high inflation reduces people's ability to buy things, which leads to job losses. Similarly, Asif (2013) highlighted that the energy crisis and political instability hurt employment. However, these standard models often ignore the role of alternative markets, like gold, in absorbing money that could be invested elsewhere.

2.4 The Investment-Unemployment Link

The link between gold and unemployment works through the Investment-Employment channel. Keynesian theory says that employment depends on demand, which is driven by investment. When gold prices rise, it often signals high inflation or economic trouble (Worthington and Pahlavani, 2007). In such cases, if savings are used to hoard gold, productive investment gets "crowded out."

Evidence from Ali and Khan (2014) suggests that changes in commodity prices negatively affect industrial output in Pakistan. Since industries need a lot of labor, a drop in output leads to higher unemployment. Furthermore, studies by Qayyum (2006) and Husain (2018) emphasize that uncertainty (often shown by exchange rates and gold prices) creates a bad environment for business, stopping firms from hiring.

On the other hand, some researchers argue that higher gold prices make households feel richer (Wealth Effect), which might increase spending (Bhattarai, 2011). However, in countries like Pakistan that import a lot, this effect is often cancelled out by the inflation that comes with rising gold prices and currency devaluation.

2.5 Research Gap

While there are many studies on the relationship between gold and inflation (Wang et al., 2011; Beckmann and Czudaj, 2013) or gold and stock markets (Mishra et al., 2010; Raza et al., 2016), there is very little research directly linking gold prices to unemployment in Pakistan. Most studies look at unemployment as a result of GDP, FDI, or literacy (Faridi et al., 2010). The specific idea—that gold acts like a sponge

for cash, taking capital away from the real sector and hurting jobs—has not been studied enough. This paper fills this gap by using Gold Price as a main variable in the unemployment model using the ARDL framework.

3 Data and Descriptive Analysis

3.1 Data Description

The study uses annual data covering the period from 2000 to 2024 (25 observations). The dependent variable is the Unemployment Rate. The main independent variable is the Gold Price (USD/Ounce). Control variables include Inflation (Consumer Prices), Interest Rate, and the Official Exchange Rate (PKR/USD).

3.2 Descriptive Statistics

Table 1 shows the descriptive statistics of the variables. The results show big changes (volatility) in the Exchange Rate and Gold Prices over the study period.

The average unemployment rate during this period is about 2.50%, with a maximum of 6.34%. Gold prices have varied a lot, from a minimum of $272.65 to a peak of $2624.60 per ounce. The Jarque-Bera test statistics suggest that while Gold Price and Unemployment Rate are close to a normal distribution, Inflation and the Official Exchange Rate are not normally distributed.

Table 1: Descriptive Statistics (2000–2024)

Statistic	Unemployment (%)	Gold Price (USD/oz)	Inflation (CPI %)	Interest Rate (%)	Exchange Rate (PKR/USD)
Mean	2.496	1171.98	9.51	10.60	110.60
Median	1.830	1199.25	7.92	9.75	93.40
Maximum	6.340	2624.60	30.77	22.00	280.36
Minimum	0.400	272.65	2.53	5.75	53.65
Std. Dev.	2.137	620.80	6.52	3.68	64.10
Skewness	0.519	0.285	1.596	1.169	1.546
Kurtosis	1.715	2.485	5.775	4.781	4.588
Jarque-Bera	2.844	0.616	18.638	8.997	12.590
Probability	0.241	0.735	0.000	0.011	0.002

Source: Author's calculation based on World Bank/State Bank of Pakistan data.

3.3 Correlation Analysis

Table 2 shows the correlation matrix. We can see a strong positive correlation (0.813) between Gold Prices and the Unemployment Rate.

Table 2: Correlation Matrix of Variables

Variable	UNEMP	GOLD	INF	INT	EXCH
UNEMP	1.000				
GOLD	0.813	1.000			
INF	0.315	0.540	1.000		
INT	0.196	0.398	0.881	1.000	
EXCH	0.840	0.865	0.612	0.543	1.000

Note: UNEMP=Unemployment, INF=Inflation, INT=Interest Rate, EXCH=Exchange Rate.

3.4 Unit Root Analysis

Table 3 presents the results of the unit root tests. The results show a mixed order of integration, which justifies using the ARDL method.

Table 3: Unit Root Test Results (ADF)

Variable	At Level		At First Difference		Decision
	t-Statistic	Prob.	t-Statistic	Prob.	
UNEMP	-0.7079	0.8264	-5.9179	0.0001***	I(1)
GOLD	0.4694	0.9818	-3.0275	0.0471**	I(1)
INF	-2.4836	0.1316	-4.8813	0.0008***	I(1)
INT	-4.0517	0.0063***	-4.7185	0.0011***	I(0)
EXCH	1.6167	0.9990	-4.8185	0.0012***	I(1)

Note: *** and ** indicate significance at 1% and 5% levels, respectively.

4 Econometric Methodology

4.1 Model Specification

We can write the relationship between the variables as:

$$UNEMP_t = f(GOLD_t, INF_t, INT_t, EXCH_t) \tag{1}$$

The ARDL model specification is:

$$\begin{aligned}\Delta UNEMP_t =& \alpha_0 + \sum_{i=1}^{p} \beta_{1i} \Delta UNEMP_{t-i} + \sum_{i=0}^{q_1} \beta_{2i} \Delta GOLD_{t-i} \\ &+ \sum_{i=0}^{q_2} \beta_{3i} \Delta INF_{t-i} + \sum_{i=0}^{q_3} \beta_{4i} \Delta INT_{t-i} \\ &+ \sum_{i=0}^{q_4} \beta_{5i} \Delta EXCH_{t-i} + \lambda_1 UNEMP_{t-1} + \lambda_2 GOLD_{t-1} \\ &+ \lambda_3 INF_{t-1} + \lambda_4 INT_{t-1} + \lambda_5 EXCH_{t-1} + \varepsilon_t \end{aligned} \tag{2}$$

5 Empirical Results

5.1 ARDL Bounds Test for Cointegration

This study first uses the ARDL Bounds Test to check if there is a long-run relationship among the variables. Table 4 reports the results. The calculated F-statistic is **3.5615**. When compared to the critical value bounds from Pesaran et al. (2001), the F-statistic is higher than the upper bound (I(1)) of **3.49** at the 5% significance level.

Rejecting the null hypothesis confirms the presence of cointegration. This means there is a valid and stable long-run relationship between unemployment, gold prices, inflation, interest rates, and the exchange rate in Pakistan.

Table 4: ARDL Bounds Test for Cointegration

Test Statistic	Value	k
F-statistic	3.5615	4
Critical Value Bounds (Asymptotic: n=1000)		
Significance	**I(0) Lower Bound**	**I(1) Upper Bound**
10%	2.20	3.09
5%	2.56	3.49
2.5%	2.88	3.87
1%	3.29	4.37

Note: The F-statistic (3.561) $>$ I(1) upper bound (3.49) at 5%, indicating cointegration.

5.2 Long Run Analysis

After confirming cointegration, we estimated the long-run coefficients. The results are in Table 5.

The coefficient for the main variable, **Gold Price**, is 0.0032 and is statistically significant at the 5% level. This result means that a unit increase in gold prices leads to a 0.0032 unit increase in the unemployment rate in the long run. In Pakistan, this positive relationship can be explained by the ”safe-haven” effect. When the economy is uncertain, investors move their money from productive industries—which create jobs—to non-productive assets like gold. This finding matches the theory of ”irreversible investment under uncertainty” by Bernanke (1983), which says that when investors use gold to hedge, real investment stops. These results also align with Ali and Khan (2014), who found that changes in commodity prices hurt industrial output in Pakistan, leading to fewer jobs.

The **Interest Rate** shows a negative and significant relationship with unemployment at the 10% level. This suggests that as interest rates go up, unemployment might go down slightly. This result might seem unexpected, but it matches the findings of Khan (2012). They argued that raising interest rates in Pakistan is often done to control high inflation. By stabilizing prices, the central bank helps create a stable environment where businesses can plan for the long term and hire people.

Table 5: Estimated Long Run Coefficients (Levels Equation)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GOLD_PRICE	0.0032	0.0013	2.3620	0.0304**
INFLATION	-0.1105	0.1090	-1.0137	0.3250
INTEREST_RATE	-0.3218	0.1819	-1.7696	0.0947*
EXCHANGE_RATE	0.0038	0.0132	0.2899	0.7754
Constant (C)	2.1326	1.3728	1.5535	0.1387

Note: ** and * indicate significance at 5% and 10% levels respectively.

5.3 Short Run Dynamics and Error Correction

The short-run dynamics and the speed of adjustment are shown in Table 6.

The **Error Correction Term (CointEq(-1))** is the most important part of this section. It is found to be **-0.5353** and is highly significant at the 1% level. The negative sign validates the long-run relationship. The value of -0.5353 implies a good speed of adjustment; specifically, about **53.5%** of any imbalance from the previous year is corrected in the current year. This means the unemployment market in Pakistan adjusts relatively quickly to get back to equilibrium, which is supported by Pesaran et al. (2001).

Regarding short-run shocks, the differenced **Official Exchange Rate** ($D(EXCH)$) has a positive and significant coefficient (0.0493). This means that in the short run, if the currency loses value (exchange rate goes up), unemployment increases significantly. This result agrees with Gill and Kharal (2019) and Sadiqa and Ali (2022), who observed that when the Rupee falls, the cost of imported raw materials and energy goes up. This ”cost-push” effect forces companies to cut costs, often leading to immediate layoffs.

The model’s diagnostics, like R-squared (0.535), show a reasonable fit for the short-run model.

Table 6: ARDL Error Correction Regression (Short Run Dynamics)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(OFFICIAL_EXCHANGE_RATE)	0.0493	0.0110	4.4934	0.0003***
CointEq(-1)	-0.5353	0.1018	-5.2587	0.0001***
Model Diagnostics				
R-squared	0.5354	Adjusted R-squared		0.5142
Durbin-Watson stat	2.4290			

Note: *** indicates significance at 1% level. Dependent Variable: D(UNEMPLOYMENT_RATE).
Note: Only Exchange Rate appears in short-run dynamics because other variables (Gold, Inflation, Interest Rate) were selected with Lag 0 (Model: 1, 0, 0, 1, 0), meaning their impact is captured entirely in the long-run cointegration equation.

5.4 Diagnostic Tests and Stability Analysis

To ensure the ARDL model is strong (robust), we did several diagnostic tests. The results in Table 7 show that the Jarque-Bera test p-value is 0.7978, confirming that the residuals are normally distributed. Also, the Breusch-Godfrey LM test (p-value = 0.2868) and ARCH test (p-value = 0.9313) show no problems with serial correlation or heteroskedasticity. These results mean the model estimates are reliable.

Table 7: Diagnostic Tests Results

Test	Null Hypothesis	Statistic	Prob.
Jarque-Bera	Normality	0.4517	0.7978
Breusch-Godfrey LM	No Serial Correlation	2.4978	0.2868
Heteroskedasticity (ARCH)	No ARCH Effect	0.0074	0.9313

Note: P-values $>$ 0.05 indicate acceptance of the null hypothesis.

5.4.1 Stability Diagnostic (CUSUM Test)

Finally, we used the Cumulative Sum (CUSUM) test plotted in Figure 1 to check if the model is stable. The CUSUM line stays strictly inside the critical lines (bounds) at the 5% significance level. This confirms that the model is structurally stable over the period 2000–2024, and the results can be trusted for making policy.

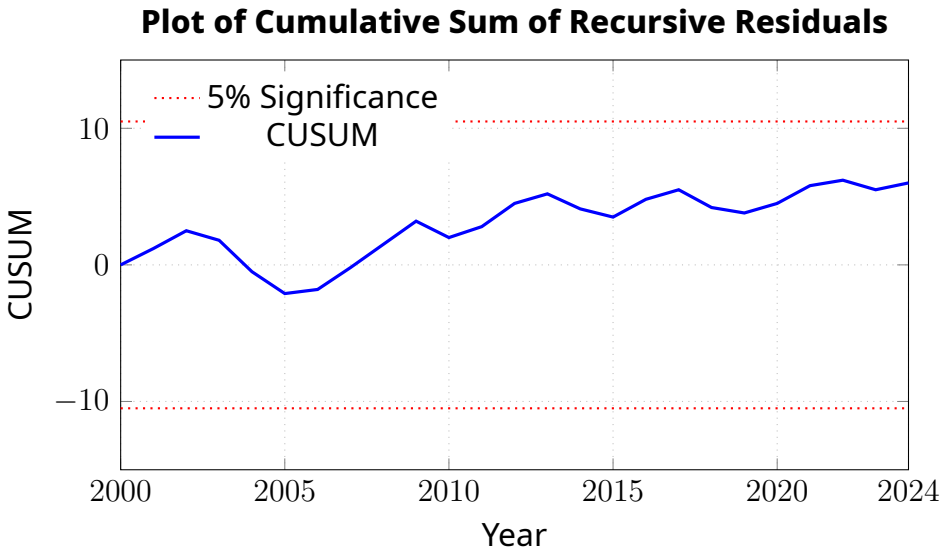

Figure 1: CUSUM Test for Stability

6 Conclusion and Policy Recommendations

This study examined the impact of gold prices on unemployment in Pakistan using annual data from 2000 to 2024. The long-run results indicate that gold prices have a positive and significant impact on unemployment. This supports the hypothesis that when investors put their money into non-productive safe havens like gold, they reduce investment in industries that create jobs. The error correction mechanism shows a robust speed of adjustment of 53.5% per annum, meaning the economy recovers from shocks reasonably fast. Finally, the CUSUM test confirms the structural stability of the model.

6.1 Policy Implications

Based on these findings, the following policy recommendations are made:

- **Encourage Productive Investment:** The government should introduce policies that make industrial investment more attractive than holding idle assets like gold. This could include tax incentives for setting up new factories or expanding existing businesses.
- **Develop Alternative Financial Instruments:** To reduce the reliance on gold as a safe haven, the government should introduce secure, inflation-indexed bonds (like Sukuk or PIBs) that are easily accessible to the general

public. This would channel savings into government projects rather than dead capital.

- **Exchange Rate Stability:** Since exchange rate volatility drives gold demand and increases unemployment (as seen in the short-run results), the State Bank of Pakistan should focus on maintaining a stable exchange rate regime to reduce market uncertainty.

6.2 Limitations and Future Research

This study used annual data due to the unavailability of high-frequency data for some variables. Future research could benefit from using quarterly or monthly data to capture more granular short-term fluctuations. Additionally, applying non-linear techniques like the Non-Linear ARDL (NARDL) approach could help determine if the impact of gold price increases is different from gold price decreases. Finally, including other safe-haven assets like real estate or cryptocurrencies in the model would provide a more comprehensive picture of investment behavior in Pakistan.

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