

Mediating Role Of Alcohol Consumption On The Relation Between Unemployment And Economic Growth In India And China

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The relationship between unemployment and economic growth has long been a critical area of economic research. ¹Unemployment is often seen as a direct result of economic downturns or structural economic shifts, while economic growth tends to be linked with improved employment opportunities, income levels, and living standards. However, these relationships are often not as straightforward as they seem. In particular, ² the role of alcohol consumption as a mediator between unemployment and economic growth remains an understudied but potentially influential factor. Alcohol consumption can have significant economic and social implications, affecting both individuals' well-being and broader societal economic conditions.

As a coping mechanism during periods of economic hardship, alcohol consumption often increases in response to rising unemployment rates. ³This increase in consumption, particularly in countries experiencing economic instability, may have both positive and negative effects on the economy. On one hand, alcohol consumption can stimulate certain industries, creating economic benefits in the alcohol production and distribution sectors. On the other hand, it can negatively impact labor productivity, increase healthcare costs, and contribute to social issues, all of which can hinder long-term economic growth. ⁴The connection between alcohol consumption and economic conditions is particularly relevant in global contexts, where economic crises, labor market fluctuations, and changes in consumption patterns frequently intersect. In developed countries, the effects of alcohol consumption on economic productivity and public health have been widely studied, showing that excessive alcohol use can reduce workforce participation and overall economic output. Meanwhile, in ⁵developing economies, alcohol consumption may be growing due to urbanization and shifts in social norms, with implications for both individual economic outcomes and national economic performance.

In countries with high levels of unemployment, alcohol may serve as an emotional escape, contributing to reduced economic productivity and social instability, further exacerbating the cycle of economic decline.

¹ Blanchard, O. J., & Summers, L. H. (1986). Hysteresis and the European unemployment problem. *NBER Macroeconomics Annual*, 1, 15–78.

² Zhang, W., & Wan, Y. (2019). The relationship between alcohol consumption and economic development in China. *Asian Economic Policy Review*, 14(2), 194-210.

³ Meier, P. S., Nilsen, P., & Wallin, E. (2016). The relationship between alcohol consumption and economic productivity: A systematic review. *Addiction*, 111(6), 1110-1120.

⁴ Foley, E. E., & Meng, X. (2020). Alcohol consumption in China and its socio-economic determinants. *Journal of Economic Studies*, 47(3), 643-661.

⁵Kessler, R. C., Aguilar-Gaxiola, S., Alonso, J., Benjet, C., Bromet, E. J., et al. (2016). The burden of mental disorders and the need for a global perspective. *Journal of the American Medical Association*, 310(5), 547-548.

Conversely, in some cases, the alcohol industry can provide a temporary boost to local economies, through job creation and tax revenue. However, this is often at the cost of longer-term sustainable growth due to the broader negative impacts on public health, education, and other sectors of the economy.

⁶Understanding the mediating role of alcohol consumption in this context is crucial, as it offers valuable insights into how social behaviors and economic policies interact. It also highlights the importance of considering public health and social well-being alongside traditional economic metrics when analyzing the broader implications of unemployment and economic growth. The interrelationship between economic variables such as unemployment, economic growth, and the consumption of goods, including alcohol, has long been a subject of scholarly inquiry. In particular, the nexus between unemployment and economic growth has been studied extensively, often with a focus on how one influences the other. While ⁷unemployment is often seen as a direct consequence of economic downturns or structural changes, its implications may extend beyond economic indicators, influencing social behaviors such as consumption patterns. Alcohol consumption, as a widespread social phenomenon, has been suggested to serve as a coping mechanism in times of economic distress, potentially mediating the effects of unemployment on economic growth.

In countries like India and China, where rapid economic transitions and significant fluctuations in employment rates are observed, ⁸the role of alcohol consumption in shaping or mediating the impacts of unemployment on economic performance warrants closer examination. Both countries, as emerging economic powers, have experienced tremendous growth but also face challenges like rising unemployment rates and increasing alcohol consumption, particularly among their working-age populations. However, little attention has been paid to how alcohol consumption might mediate the effects of unemployment on broader economic dynamics in these countries.

Understanding this mediating role is essential because alcohol consumption may have multifaceted effects on individuals' productivity, health, and social behaviors, which in turn influence macroeconomic performance. ⁹If alcohol consumption increases due to unemployment, it could exacerbate public health issues, reduce labor market participation, and increase healthcare expenditures, ultimately hindering economic growth. Conversely, alcohol consumption may also have indirect economic benefits through increased demand in the alcohol industry, though these effects are less widely studied in relation to unemployment. As such, this study aims to explore how alcohol consumption mediates the relationship between unemployment and economic growth in India and China, providing insights for policymakers in both countries.

By examining this phenomenon, the study contributes to the growing body of research on the socio-economic impacts of alcohol consumption and offers insights into the complexities of economic behavior in the context of developing economies. The findings of this study are crucial for understanding how unemployment, alcohol consumption, and economic growth are interconnected in a rapidly changing global economy.

This study seeks to explore how alcohol consumption mediates the relationship between unemployment and economic growth on a global scale, shedding light on the complex interactions between social behaviors, economic policies, and public health. By examining the potential positive and negative effects of alcohol consumption, it aims to contribute to a more comprehensive understanding of economic growth dynamics in the context of global unemployment challenges.

Objective: The objective of this study is to examine the mediating role of alcohol consumption on the relationship between unemployment and economic growth in India and China. A quantitative approach has been adopted to examine the relationship between key economic variables. The study utilizes time series data collected from reliable sources, such as the World Development Indicators (WDI) published by the World Bank.

⁶ Blanchard, O. J., & Summers, L. H. (1986). Hysteresis and the European unemployment problem. *NBER Macroeconomics Annual*, 1, 15–78.

⁷Zhang, W., & Wan, Y. (2019). The relationship between alcohol consumption and economic development in China. *Asian Economic Policy Review*, 14(2), 194-210.

⁸ Foley, E. E., & Meng, X. (2020). Alcohol consumption in China and its socio-economic determinants. *Journal of Economic Studies*, 47(3), 643-661.

⁹Meier, P. S., Nilsen, P., & Wallin, E. (2016). The relationship between alcohol consumption and economic productivity: A systematic review. *Addiction*, 111(6), 1110-1120.

Robust least squares method: In regression analysis, the Ordinary Least Squares (OLS) method is widely used to estimate relationships between variables. However, OLS is highly sensitive to outliers and heteroskedasticity, which can lead to biased or inefficient estimates. To address these limitations, the Robust Least Squares (RLS) method has been developed as an alternative approach that provides reliable estimates even in the presence of outliers and deviations from standard regression assumptions.

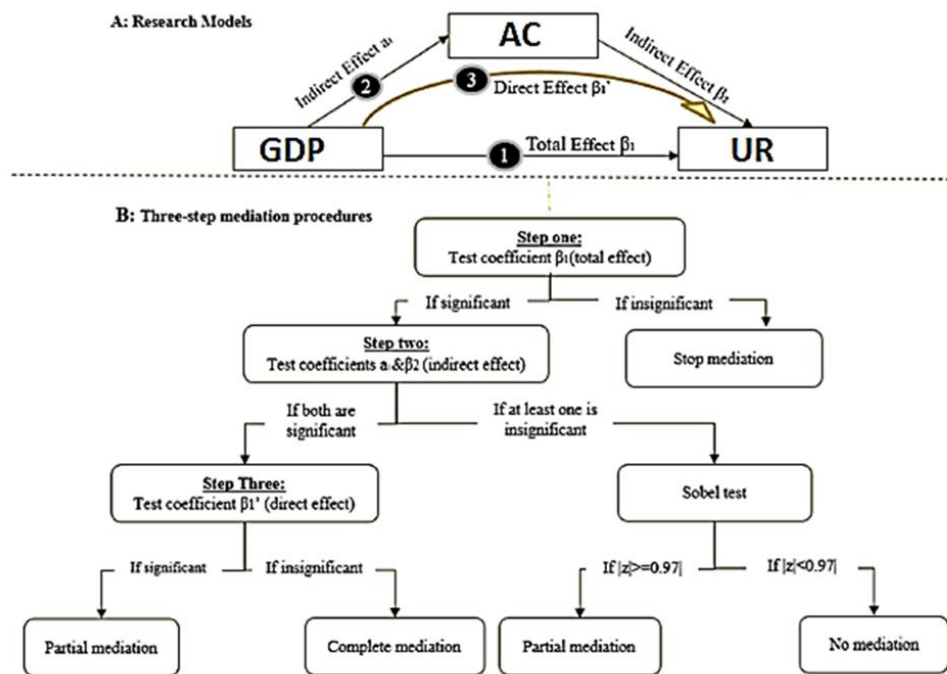
The Robust Least Squares method minimizes the influence of extreme values by applying weighted estimators or alternative loss functions that reduce the effect of outliers. Unlike OLS, which assumes normally distributed residuals with constant variance, RLS techniques accommodate non-normal errors and heteroskedasticity, making them suitable for real-world datasets that often contain anomalies.

Several robust regression techniques exist, including Huber regression, Least Absolute Deviations (LAD), and M-estimation, each designed to enhance model stability and reliability. By improving robustness, these methods ensure that regression models provide more accurate and meaningful results in diverse fields such as economics, finance, and engineering, where data irregularities are common.

The use of Robust Least Squares is particularly important in empirical research, where ensuring the validity of statistical inferences is crucial. This study employs RLS to obtain robust parameter estimates, minimizing the distortions caused by outliers and model specification issues, thereby leading to more precise and reliable conclusions.

Robust least squares method is used to examine the mediating role of alcohol consumption on the relationship between unemployment and economic growth in India and China. Following Sobel (1982, 1986) and Baron and Kenny (1986), a three-step procedure (Preacher and Hayes, 2004; Wu et al., 2020) is adopted to estimate the mediating effect of AC on the relationship between UR and GDP. The first step is to examine whether a causal relationship exists between UR and GDP, estimated using Model (1). The second step examines whether a significant relationship exists between the independent variable (UR) and the mediator variable (AC), estimated using Model (2). The third step is to examine the effect of the independent variable (UR) on the dependent variable (GDP) when controlling for the mediator (AC), estimated using Model (3).

Figure 1. Mediation effect of alcohol consumption



$$\text{Model 1: } GDP_t = \beta_0 + \beta_1 UNR_t + \sum CV + \varepsilon_{1t} \quad (7)$$

$$\text{Model 2: } AC_t = \alpha_0 + \alpha_1 UNR_t + \sum CV + \varepsilon_{1t} \quad (8)$$

$$\text{Model 3: } GDP_t = \beta'_0 + \beta'_1 UNR_t + \beta_2 AC_t + \sum CV + \varepsilon_{1t} \quad (9)$$

where, UNR is the unemployment rate, GDP is Gross Domestic Product growth rate and AC is the alcohol consumption. CV represents the control variables viz. Trade (TRADE), Remittances (REMIT), Population (POP), Infrastructure facilities (INFRA), foreign direct investment (FDI), domestic investment (DI), domestic credit (DC) and Inflation (CPI). The detailed three-step mediation procedure is presented in figure 3. Model (1) tests the total effect of UR on GDP (β_1). If β_1 is significant (otherwise, the analysis is terminated), then the process proceeds to Models (2) and (3), which examine the indirect effect of UR on GDP mediated by AC. If both the indirect effects (α_1 and β_2) and the direct effect (β_1') are significant, then a partial mediation effect exists (Preacher and Hayes, 2004). Otherwise, if the direct effect (β_1') is insignificant, but the indirect effects (α_1 and β_2) are significant, a complete mediation effect exists. If either α_1 or β_2 is not significant, the Sobel (1982) test⁵ must be conducted. If the absolute z-value of the Sobel test is greater than the critical value of 0.97 (MacKinnon et al., 2002), a partial mediating effect of AC can be confirmed; otherwise, no mediation effect exists.

The data for this study has been obtained from the World Development Indicators (WDI), a comprehensive and reliable database published by the World Bank. Due to limitations in data availability, the analysis of alcohol consumption is based on annual data for a period of 23 years from 2001 to 2023. Understanding alcohol consumption trends is essential for assessing their socio-economic implications, including public health concerns, government policies, and economic factors affecting consumption patterns.

Hypotheses:

H₀: Alcohol consumption do not mediates on the relation relationship between the unemployment and economic growth

H₁: Alcohol consumption mediates on the relation relationship between the unemployment and economic growth

The study of unemployment has been a central theme in economic, historical, and social research for centuries. Scholars have explored its causes, consequences, and policy responses across different historical periods and economic systems. This chapter provides a comprehensive review of existing literature on unemployment, tracing its conceptual development from early economic thought to contemporary debates.

Lin Yi, Song Kaifeng, Tu Jingbin, and Lai Liangrong, (2022) explored the asymmetry of Okun's Law, analyzing unemployment's impact on economic growth with alcohol consumption as a mediating factor. Using WDI data (2000–2020) and a two-way fixed-effects model, they found that unemployment negatively affects growth, with alcohol consumption exacerbating its effects. The study confirms Okun's Law asymmetry and highlights unemployment's social consequences on re-employment and economic contribution. Lucía Artazcoz, Joan Benach, Carme Borrell, and Immaculada Cortès, (2004) examined how unemployment affects mental health, considering gender, family roles, and social class using data from the 1994 Catalan Health Survey. They found unemployment impacted men's mental health more, while benefits helped but varied by social class. Family roles influenced mental health differently by gender, highlighting the need for tailored policies addressing these factors.

Zhihao Xu, Jialong Tan, Stephen Nicholas, Elizabeth Maitland, Yue Zhong, Lu Han, Jian Wang (2024) examine how unemployment affects health expenditures in China, highlighting regional disparities. The study finds that unemployment reduces healthcare spending, especially in central and western regions, while unemployment insurance helps mitigate this impact. Policymakers should strengthen social security, expand healthcare access, and support unemployed individuals through financial aid and job creation programs. Marcus Hagedorn, Fatih Karahan, Iourii Manovskii, and Kurt Mitman, (2013) analyzed the macroeconomic effects of unemployment benefit extensions during the Great Recession. They found that extended benefits raised wages, reduced job vacancies, and increased unemployment by influencing firms' hiring decisions. The study highlights the need to balance income support with minimizing negative labor market impacts.

Matilde Leonardi, Davide Guido, Rui Quintas, Fabiola Silvaggi, Erika Guastafierro, Andrea Martinuzzi, Somnath Chatterji, Seppo Koskinen, Beata Tobiasz-Adamczyk, Josep Maria Haro, Maria Cabello, Alberto Raggi, (2018) examined factors influencing unemployment in Finland, Poland, and Spain using the COURAGE survey. Health issues, low education, and sensory impairments increased unemployment risk, while marriage and moderate alcohol consumption were protective factors. The study highlights the need for health-focused policies to improve labor market participation. Wei Ge (2008) analyzed urban unemployment in China, highlighting rapid urbanization, rural-to-urban migration, and structural job losses, especially in manufacturing and SOEs. The study found skill mismatches and underestimated unemployment rates, emphasizing the need for vocational training, financial support for private enterprises, and balanced economic policies.

John Knight and Jinjun Xue (2006) found that official urban unemployment rates in China were underestimated due to excluded groups like rural migrants and discouraged workers. Their adjusted estimates showed unemployment rising from 4.2% in 1982 to 11.5% in 2000, with layoffs from state enterprises and young job seekers most affected. The study highlights the need for comprehensive labor surveys and policies supporting re-employment and migrant integration. Shuaizhang Feng et al. (2023) analyze youth unemployment in China, highlighting demand- and supply-side factors worsened by the COVID-19 pandemic. Key issues include

declining job creation, skill mismatches, and a preference for government jobs over private-sector roles. The study recommends economic stimulus, targeted support for vulnerable groups, and improved education-to-job alignment.

Milan Vodopivec and Minna Hahn Tong (2008) analyze China's unemployment insurance (UI) system, identifying key challenges such as limited coverage, low benefits, and weak enforcement. They recommend expanding coverage, improving benefit structures, and strengthening administration for better efficiency. The study highlights the need for balanced reforms to enhance income security while ensuring labor market sustainability.

Ritika Agrahari, Ankita, Kumari Neelam, (2023) analyze unemployment in India, its causes, and government initiatives. The study finds an 8.2% unemployment rate in December 2022, driven by population growth, slow economic expansion, and technological changes. Effective policy implementation, education reforms, and investment promotion are key to reducing unemployment.

The socio-demographic factors that are playing a role in rising consumption in Asia are changing social norms that make it easier for both young men and women to drink, and higher life expectancy that increases the years of drinking among consuming adults, which raises gross national consumption. However, high alcohol consumption and problem drinking increases the risk of leaving the labour market and is a barrier to re-employment. From a psychological perspective, the financial challenges associated with unemployment could increase tension, anxiety, and family discord, thus leading to increased alcohol use. The unemployment increases alcohol consumption, which causes incurable harm to the unemployed. It reduces the willingness and probability of the unemployed to re-employ and further reduces the potential for economic growth. Therefore, alcohol consumption plays an intermediary role in the relationship between unemployment and economic growth.

The linear growth rate of India's per capita alcohol consumption is 3.432 percent and 2.436 percent for the Chinese economy. This implies that population consuming alcohol in India is relatively more than the China. Indians drink to get intoxicated rather than use it for socializing or recreation. The consequences include higher healthcare and social care costs, crime, loss of life, accidents, and loss of employment which are directly linked to high per capita intake of alcohol. Unemployment is a permanent injury to the unemployed. In order to subside the harm caused by unemployment with respect to economic activity, the policy makers and regulators should examine and taken into consideration the mediating role alcohol consumption on the relationship between the unemployment rate and economic growth in India.

Table 1 shows a result of trend analysis for the unemployment rate (UNR), GDP Growth Rate and Alcohol Consumption into India and China. The unemployment rate in India has decreased annually by 0.076 percent and it has decreased by 0.0309 percent for China. The linear growth rate implies that the unemployment rate in India decreased at a growth rate of 1.050 percent for India and 0.689 percent for China for the period from 2001 to 2023. India is relatively better performing in reducing the unemployment rate than China. This shows that India maintains a well-functioning labour market and balanced economic conditions than the Chinese economy. The regression coefficients are significant at one percent level. The value of R-square shows that it is more than 48 percent of variation in dependent variables and it is explained by the independent variable for both India and China.

Table 1. Trend Analysis for the Unemployment rate, Economic Growth and Alcohol Consumption in India and China

Country	Variable	Parameter	Coefficient	t-Statistic	Prob.	R ²	Linear Growth Rate (%)
India	UNR	β_1	-0.076577	-3.353700	0.0029	0.48329	-1.050895
		α_1	161.3223	3.512331	0.0020	2	
China	UNR	β_1	-0.030913	-3.775377	0.0010	0.49316	-0.689381
		α_1	-57.69742	-3.503099	0.0020	2	
India	GDPR	β_1	-0.016465	-2.176068	0.0419	0.47980	-0.266527
		α_1	39.29655	2.208908	0.0364	7	
China	GDPR	β_1	-0.271492	-4.656791	0.0001	0.49640	-3.271412
		α_1	554.4059	4.727530	0.0001	3	
India	AC	β_1	0.131730	6.067297	0.0000	0.62592	3.432703
		α_1	-261.1383	-5.979392	0.0000	7	
China	AC	β_1	0.127465	3.830120	0.0009	0.60005	2.436218
		α_1	-251.1642	-3.751940	0.0011	2	

The GDP growth rate has decreased annually by 0.016 percent and it has increased by 0.271 percent for China. The linear growth rate implies that the GDP growth rate in China decreased at a faster rate (3.27 percent) than India (0.26 percent) for the period from 2001 to 2023. The slowdown in China is partly attributed to the collapse of the real estate sector, a crucial growth driver, coupled with rising government debt and declining local infrastructure investments. The regression coefficients are statistically significant and the value of R-square shows

that it is more than 47 percent of variation in dependent variables and it is explained by the independent variable for both India and China.

In terms of alcohol consumption, measured by total alcohol consumption per capita, the Indians consume more than the Chinese. It has increased annually by 0.131 percent for India and increased by 0.127 percent for China. The linear growth rate of India's per capita alcohol consumption is 3.432 percent and 2.436 percent for the Chinese economy. This implies that the population consuming alcohol in India is relatively more than China. Indians drink to get intoxicated rather than use it for socializing or recreation. The consequences include higher healthcare and social care costs, crime, loss of life, accidents, and loss of employment which are directly linked to high per capita intake of alcohol. The regression coefficients are statistically significant and the value of R-square shows that it is more than 60 percent of variation in dependent variable and it is explained by the independent variable for both India and China.

Table 2 provides the summary statistics of unemployment rate, economic growth and alcohol consumption for India and China. The Indian average unemployment rate and economic growth rate of India is 7.2868 percent and 6.1776 percent, respectively. For China, the average unemployment rate and economic growth rate is 4.4841 percent and 8.2989 percent, respectively. The unemployment rate is relatively low for China and the GDP growth rate of China is higher compared to India. The alcohol consumption is found to be relatively higher for India during the study period.

Table 2. Summary statistics

India			
	UR	GDP	AC
Mean	7.286833	6.177605	3.837500
Median	7.628000	7.198633	4.190000
Maximum	7.859000	9.689592	5.040000
Minimum	4.172000	-5.777725	1.970000
Std. Dev.	0.930978	3.103690	1.177360
China			
Mean	4.484167	8.298924	5.232083
Median	4.555000	8.392101	5.255000
Maximum	5.000000	14.23086	7.350000
Minimum	3.260000	2.238638	3.250000
Std. Dev.	0.348611	2.724743	1.425013
Observations	24	24	24

Table 3. Correlation Matrix of determinants of the Indian economy

	GDP	UR	TRADE	REMIT	POP	INFRA	FDI	DI	DC	CPI
GDP	1									
UR	-0.2143	1								
TRADE	0.2075	-0.1701	1.0000							
REMIT	-0.1096	-0.0172	0.5830	1						
POP	0.0207	0.6051	-0.4701	-0.0609	1.0000					
INFRA	-0.0350	-0.3542	0.5266	0.1039	-0.7998	1				
FDI	-0.2794	0.2242	0.4871	0.4794	-0.2521	0.2691	1			
DI	0.3466	0.1065	0.7049	0.4166	0.0942	-0.0863	0.4023	1		
DC	-0.0251	-0.2976	0.7002	0.3609	-0.7350	0.7781	0.5310	0.3178	1	
CPI	0.0039	0.0878	0.7148	0.6958	-0.0857	0.2243	0.4687	0.6412	0.4930	1

Table 4. Correlation Matrix of determinants of the Chinese economy

	GDP	UR	TRADE	REMIT	POP	INFRA	FDI	DI	DC	CPI
GDP	1									
UR	-0.3383	1								
TRADE	0.7271	0.0130	1.0000							
REMIT	0.1716	0.3995	0.2943	1						
POP	0.5026	-0.5477	0.3359	0.2198	1.0000					
INFRA	-0.7145	0.6050	-0.5982	0.0063	-0.6880	1				
FDI	0.7480	-0.3703	0.8160	0.0492	0.6372	-0.7416	1			
DI	-0.2089	0.7310	-0.0187	0.4391	-0.2636	0.6368	-0.2860	1		
DC	-0.7232	0.5069	-0.7291	-0.0853	-0.7907	0.7975	-0.7192	0.3453	1	
CPI	0.2284	0.2250	0.4653	0.3038	0.0492	0.0540	0.2879	0.3986	-0.2299	1

In order to investigate the mediating effect of alcohol consumption on the relationship between unemployment and economic growth in India and China, the robust least square method is applied. Prior to this, Table 3 & 4 shows the correlation matrix of unemployment rate, economic growth and control variables considered for India and China. The existence of high correlation between certain variables may lead to the issue

of multicollinearity. Gujarati, Porter and Gunasekar (2012) stated that multicollinearity occurs if two variables have a correlation coefficient that exceeds the 0.80 benchmark. The findings show no evidence of multicollinearity among the independent variables included in the empirical model.

The robust least squares method is employed to examine the mediating effect of AC in the relationship between UNR and GDP in India and China. Robust least squares refers to a variety of regression methods designed to be robust, or less sensitive, to outliers. The study applied the influence statistics and leverages plots to identify the outliers in the dependent variables and the regressors, respectively. Figure 3 & 3 shows the inferential statistics for the dependent variables GDP and Alcohol consumption, respectively, in the case of the Indian economy. The spikes in the graphs for all three influence measures indicate the presence of outliers. This finding is also confirmed by the leverage plot view depicted in Figure 4 & 5. Leverage is a measure of how far an independent variable deviates from its mean. High leverage points can have a great amount of effect on the estimate of regression coefficients.

Figure 2. Inferential statistics (Dependent variable: GDP – India)

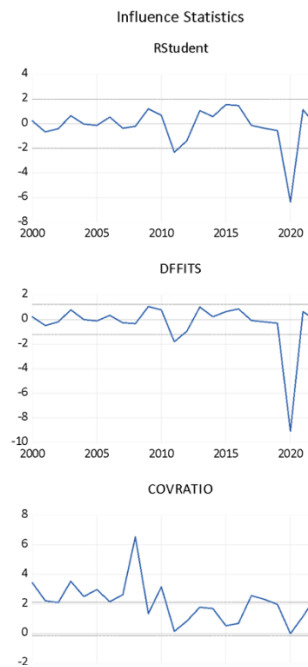


Figure 3. Inferential statistics (Dependent variable: AC – India)

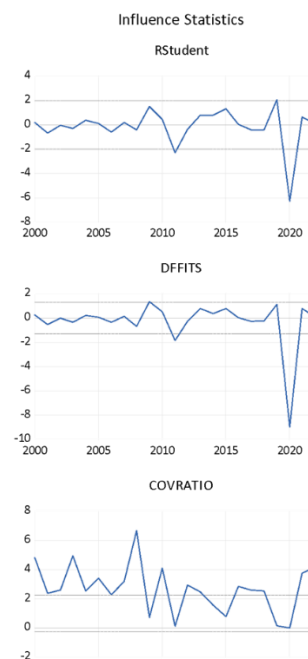


Figure 4. Leverage plots (Dependent variable: GDP – India)

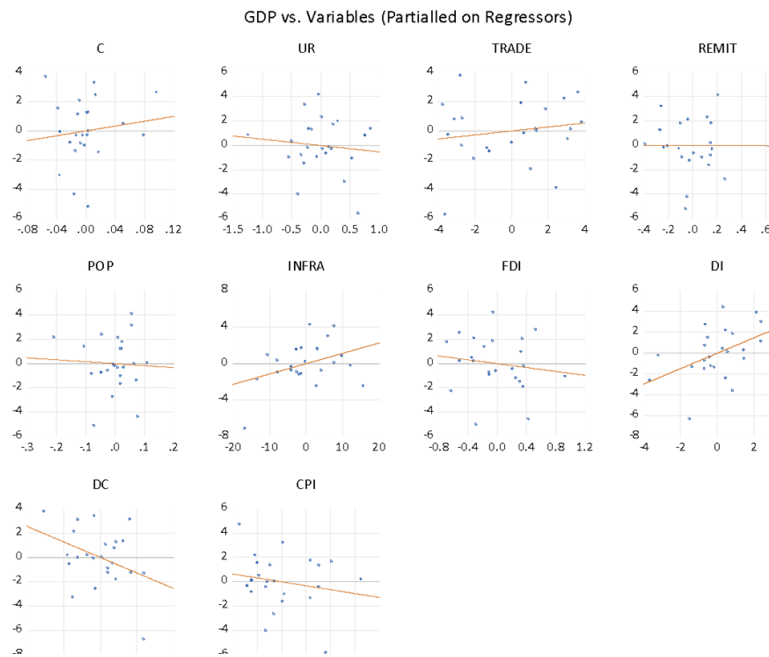


Figure 5. Leverage plots (Dependent variable: AC – India)

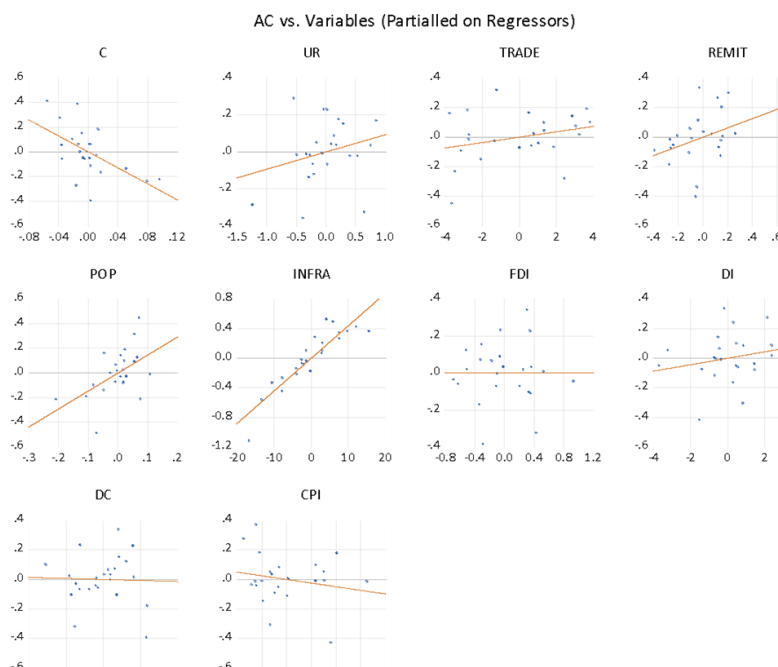


Table 5. The mediating effect of AC in the relationship between UNR and GDP in India

Coefficients	Model 1 Dependent Variable: GDP	Model 2 Dependent Variable: AC	Model 3 Dependent Variable: GDP
C	9.172303 [1.016274]	-2.922009* [-5.348987]	70.34078* [17.02298]
UR	-1.415306** [-2.118880]	0.268433* [6.639718]	-4.208487* [-16.13737]
AC	--	--	15.13840* [20.91997]
TRADE	-0.282647** [-2.331123]	-0.005315 [-0.724298]	0.019456 [0.408734]
REMIT	-0.809566 [-0.588160]	0.265487* [3.186714]	-8.801990* [-15.54081]

POP	-11.01094** [-2.433620]	0.537787** [1.963794]	-13.67731* [-6.821007]
INFRA	-0.074560*** [-1.891126]	0.030364* [12.72415]	-0.533800* [-15.21624]
FDI	-1.913340** [-2.526120]	-0.104481** [-2.279056]	1.256897* [4.399860]
DI	0.269589 [1.320689]	-0.007398 [-0.598824]	-0.070064 [-0.891531]
DC	0.272383 [1.228524]	0.047227* [3.519277]	-0.420415* [5.025493]
CPI	0.370742 [1.567334]	0.034897** [2.437450]	0.142189 [1.562946]
LB -Q stat.	0.3523 (0.553)	2.1538 (0.142)	0.1395 (0.709)
LB -Q ² stat.	0.0080 (0.929)	0.0308 (0.861)	0.3438 (0.558)

Note: *, **, & *** denote statistical significance at 1%, 5% and 10%, respectively. Z statistics in square brackets and the numbers in parentheses are the p-values. Ljung-Box Q statistics testing for autocorrelation under the null hypothesis of no autocorrelation in the standardized residuals. LB -Q² statistics indicates the test for heteroskedasticity under the null hypothesis of homoscedasticity in the squared residuals.

Table 5 depicts the robust least squares estimates on the mediating effect of AC in the relationship between UNR and GDP in India. The results are reported in model (1), (2) and (3) of Table 4. The results indicate that AC partially mediates the positive effect of unemployment rate (UR) on economic growth (GDP). The overall effect of UR on GDP is negative and significant ($\beta_1 = -1.4153$), as shown in model (1). The indirect effect is positive and significant ($\alpha_1 = 0.2684$) as shown in model (2). The significant indirect effect of AC on GDP ($\beta_2 = 15.138$) along with the direct effect ($\beta_1' = -4.2084$) are displayed in model (3). These significant and positive results indicate that stronger AC is associated with better UR and GDP. According to the three-step procedure, based on the significant coefficients for β_1 , α_1 , β_2 and β_1' , it is concluded that alcohol consumption partially mediates the relationship between unemployment and economic growth in India.

For the case of China, the study applied the influence statistics and leverages plots to identify the outliers in the dependent variables and the regressors, respectively. Figure 6 & 7 shows the inferential statistics for the dependent variables GDP and Alcohol consumption, respectively. The spikes in the graphs for all three influence measures point indicates the presence of outlier. This finding is also confirmed by the leverage plot view depicted in the Figure 8 & 9.

Figure 6. Inferential statistics (Dependent variable: GDP – China)

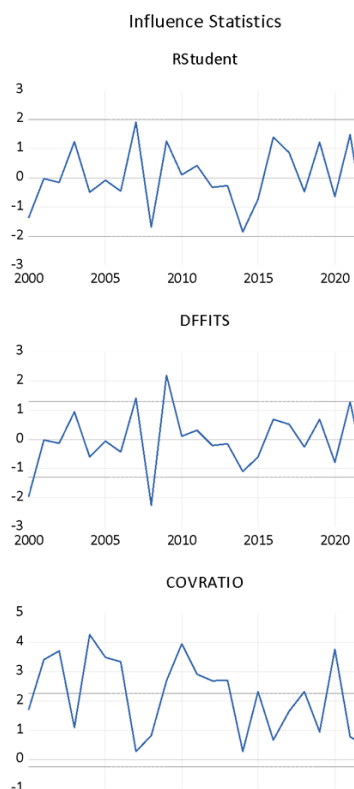


Figure 7. Inferential statistics (Dependent variable: AC – China)

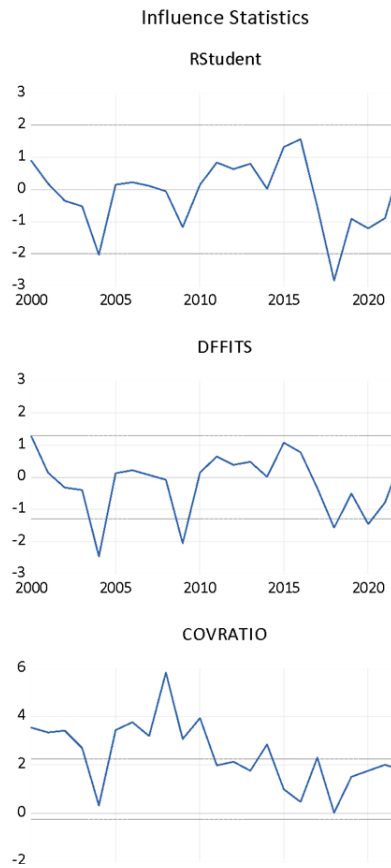


Figure 8. Leverage plots (Dependent variable: GDP – China)

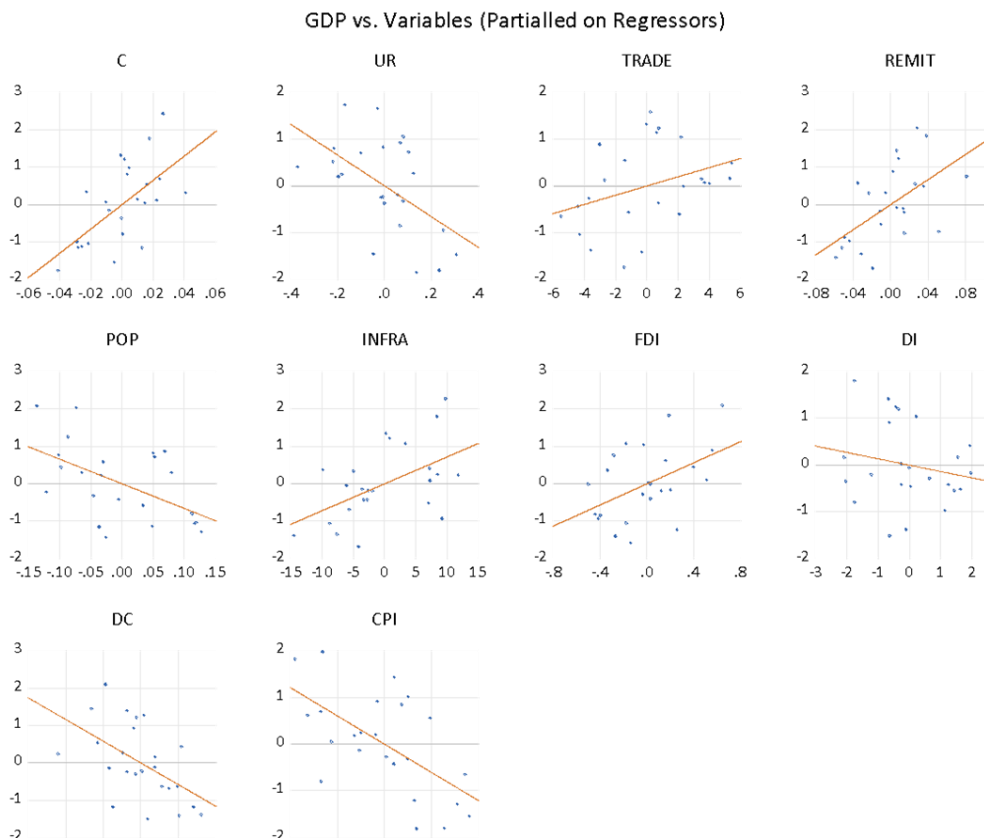


Figure 9. Leverage plots (Dependent variable: AC – China)

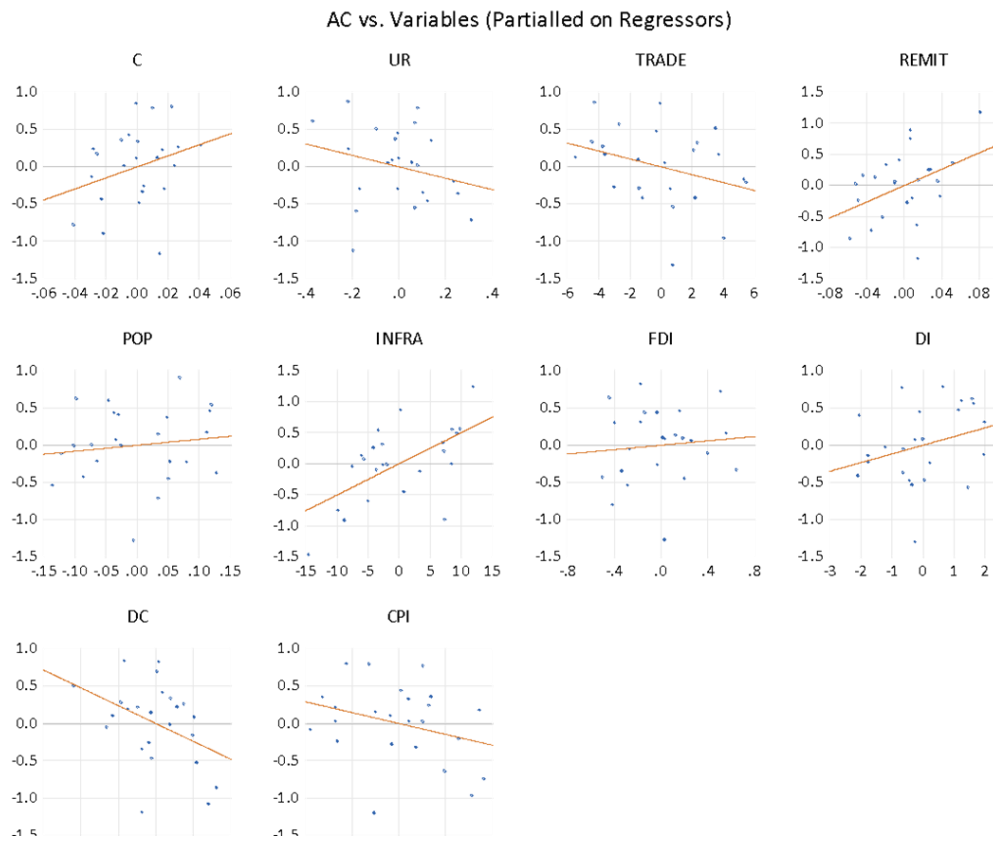


Table 6. The mediating effect of AC in the relationship between UNR and GDP in China

Coefficients	Model 1 Dependent Variable: GDP	Model 2 Dependent Variable: AC	Model 3 Dependent Variable: GDP
C	31.55542** [2.407042]	8.769875 [1.315913]	33.25789** [2.329984]
UR	-3.235013** [-1.992107]	0.735762*** [1.924065]	-3.467648** [-1.987083]
AC	--	--	0.196349* [8.399059]
TRADE	0.092764 [1.098504]	-0.047261 [-1.100898]	0.080835 [0.870618]
REMIT	16.89602** [2.198109]	6.928577*** [1.773099]	18.34480** [2.080767]
POP	-6.601310** [-2.005879]	0.790485 [0.472490]	-6.491909*** [-1.878528]
INFRA	0.069420*** [1.884031]	0.055566* [2.966427]	0.081171*** [1.701035]
FDI	1.394368*** [1.694084]	0.159023 [0.380050]	1.447937*** [1.682180]
DI	-0.108163 [-0.504062]	0.116762 [1.070372]	-0.076028 [-0.326382]
DC	-0.115231** [-1.978007]	-0.049885*** [-1.684430]	-0.126187*** [-1.901246]
CPI	-0.628442** [-2.526280]	-0.159610 [-1.262119]	-0.669437** [-2.464278]
LB –Q stat.	1.8889 (0.169)	4.8925 (0.180)	2.7940 (0.247)
LB –Q ² stat.	0.3366 (0.562)	0.3548 (0.551)	0.6128 (0.434)

Note: *, **, & *** denote statistical significance at 1%, 5% and 10%, respectively. Z statistics in square brackets and the numbers in parentheses are the p-values. Ljung-Box Q statistics testing for autocorrelation under the null hypothesis of no autocorrelation in the standardized residuals. LB –Q² statistics indicates the test for heteroskedasticity under the null hypothesis of homoscedasticity in the squared residuals.

Following the three-step mediation procedure of figure 1, Table 6 reports the mediating effect of AC in the relationship between UNR and GDP in China. The results of robust least squares method indicate that AC partially mediates the positive effect of unemployment rate (UR) on economic growth (GDP). The overall effect of UR on GDP is negative and significant ($\beta_1 = -3.2350$), as shown in model (1). The indirect effect is positive and significant ($\alpha_1 = 0.7357$) as shown in model (2). The significant indirect effect of AC on GDP ($\beta_2 = 0.1963$) along with the direct effect ($\beta_1' = -3.4676$) are displayed in model (3). These significant and positive results indicate that stronger AC is associated with better UR and GDP. According to the three-step procedure, based on the significant coefficients for β_1 , α_1 , β_2 and β_1' , it is concluded that alcohol consumption partially mediates the relationship between unemployment and economic growth in China.

I. Conclusion, Findings And Suggestion Of This Study

The robust least squares estimate on the mediating effect of AC in the relationship between UNR and GDP in India and China. The findings reject the null of Alcohol consumption do not mediates on the relation relationship between the unemployment and economic growth and accepts that alcohol consumption partially mediates the relationship between unemployment and economic growth in India and China.

The findings show that the mediating effect of alcohol consumption is relatively greater in India on the relation relationship between the unemployment and economic growth. The alcohol consumption increases the unemployment rate in India compared to the Chinese economy. Indians drink to get intoxicated rather than use it for socializing or recreation. The consequences include higher healthcare and social care costs, crime, loss of life, accidents, and loss of employment which are directly linked to high per capita intake of alcohol. Unemployment is a permanent injury to the unemployed. In order to subside the harm caused by unemployment with respect to economic activity, the policy makers and regulators should examine and taken into consideration the mediating role alcohol consumption on the relationship between the unemployment rate and economic growth in India. The unemployment increases alcohol consumption, which causes incurable harm to the unemployed. It reduces the willingness and probability of the unemployed to re-employ and further reduces the potential for economic growth. Therefore, alcohol consumption in India has more pronounced intermediary role than China on the relationship between unemployment and economic growth.

Okun's law from a social perspective is validated in India and China. The results suggest that high alcohol consumption and problem drinking increases the risk of leaving the labour market and is a barrier to re-employment. Policy recommendations to address this include strengthening restrictions on alcohol availability, promoting responsible drinking, and ensuring access to treatment and support services. Governments should be encouraged to provide the necessary psychological counseling to the unemployed and to pay attention to the mental health of the unemployed. It is anticipated that the employment situation in India will improve due to the overall economic strength and rising private investments. In the near future, cooperation and flexible approaches will be necessary to promote job opportunities for the labour force.

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