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CORRUPTION PERCEPTION INDEX (CPI) AND MACROECONOMIC DYNAMICS: FRAGILE FIVE PERSPECTIVE

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ABSTRACT

This study examines the correlation between the corruption perception index (CPI) and economic and social indices in the Fragile Five nations (Brazil, India, Indonesia, Turkey, and South Africa) from 2012 to 2022. The study examines foreign direct investment (FDI), gross domestic product per capita (GDPP), human development index (HDI), income inequality (PALMA), and unemployment rate (UNEMP) as independent factors, with the Corruption Perception Index (CPI) serving as the dependent variable. The analysis, employing the least squares (LS) method and heteroskedasticity-robust standard errors, demonstrates that economic growth (GDPP) and the unemployment rate (UNEMP) exert statistically significant influences on the impression of corruption. Nonetheless, the impacts of social indices like the Human Development Index (HDI) and income inequality (PALMA) are insignificant in the model.The findings suggest that economic growth improves the perception of corruption, but FDI has an unexpectedly negative effect. The positive association of the unemployment rate with the CPI can be explained by structural differences in the labor market and the impact of social perceptions of unemployment. These results, largely consistent with the literature, reveal the multidimensional relationship of corruption perception with economic and social indicators. The study also emphasizes the necessity of strengthening basic principles such as transparency, accountability, and the rule of law in the fight against corruption. An effective anti-corruption policy design will be possible through a holistic approach that simultaneously pursues economic growth and social equality goals. In this context, the findings provide both theoretical and practical guidance for policymakers.

Keywords: *Corruption Perception Index (CPI), Palma Ratio, Human Development Index (HDI), Least Squares Method (LSM.)*

Jel Codes: *H83, D31, O15, C20.*

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1.INTRODUCTION

Corruption is a multifaceted issue characterized by the use of public authority for personal benefit, which erodes accountability systems in public administration and causes significant disturbances in economic, social, and political frameworks. Transparency International (2023), characterizes corruption as "the abuse of entrusted power for personal gain" and highlights that it not only jeopardizes economic stability but also erodes democratic governance processes.

The effects of corruption are too extensive to be confined merely to the unethical behavior of individuals. The phenomenon has much wider implications in critical areas such as economic growth, income inequality, and social justice. The "corruption formula" (corruption = monopoly power + discretion - accountability) developed by Klitgaard (1998) provides an essential framework for understanding the structural dimensions of this problem (Yaşar and Hızarcı Beşer, 2018). The formula reveals that the spread of corruption in public administration is directly related to deficiencies in institutional mechanisms and power imbalances.

In economic terms, corruption wastes resources, reduces the quality of public services, and increases uncertainty in the investment climate. Wilhelm (2002) argues that corruption is a deterrent to foreign investment and negatively affects economic growth in the long run. Similarly, Erbuğa and Gürsoy (2023) argue that corruption weakens social justice mechanisms by increasing income inequality.

The social effects of corruption are also quite extensive. In particular, widespread corruption in basic services such as education and health negatively affects social equality by limiting the long-term economic productivity of individuals. Indicators such as the Palma Index, used to assess the strong relationship between income inequality and corruption, are important analytical tools in this context. Analyzing income inequality contributes to a better understanding of corruption's economic and social effects.

The CPI issued by Transparency International serves as a fundamental benchmark for international comparisons by assessing the perceived extent of corruption in the public sector. Nonetheless, the perception-based nature of the CPI invites critiques regarding its inadequacy in accounting for local dynamics and micro-level effects (Efeoğlu and Emsen, 2021).

This study will analyze the correlation between the perception of corruption and indicators such as the Palma Index, Human Development Index, growth rate, unemployment rate, and foreign direct investments, focusing on collectively referred to as the Fragile Five countries from 2012 to 2022. The research seeks to assess the impact of corruption on macroeconomic indicators and social dynamics from a comparative standpoint and to formulate recommendations for anti-corruption strategies based on the results.

2. CORRUPTION PERCEPTION INDEX (CPI)

2.1. Definition and Historical Development of Corruption

Corruption is characterized as the exploitation of delegated authority for individual benefit and is a systemic issue that erodes social trust, obstructs economic advancement, and diminishes democratic processes. Transparency International characterizes corruption as "the abuse of entrusted power for personal gain" and highlights its detrimental impact on public administration and accountability (Transparency International, 2023). This term offers a crucial framework for comprehending the multifaceted and extensive impacts of corruption.

The concept of corruption has been addressed in various ways in different societies and periods throughout history. Although commonly framed in contemporary discourse within the realms of public administration and economic development, corruption has been perceived as a social problem since ancient times. Wilhelm (2002) argues that corruption is a systemic problem that encourages the use of public resources for individual interests, which has devastating effects on economic growth. Similarly, Erbuğa and Gürsoy (2023) emphasize that corruption weakens social justice by increasing income inequality and that this effect is more pronounced in developing countries.

Beyond its economic effects, corruption undermines the effectiveness of democratic systems and limits the capacity of public policies to improve social welfare. Rose-Ackerman (1999) argues that corruption is a problem encouraged by inadequate oversight mechanisms and low public salaries, which should be considered a systemic deficiency (Efeoğlu and Emsen, 2021). These weak institutional structures and insufficient transparency practices cause corruption to be more widespread.

Historically, the emergence of corruption is viewed as a consequence of institutional weaknesses and social inequalities rather than merely the result of individual moral failures. In this sense, building strong institutional structures and developing effective oversight mechanisms are critical in the fight against corruption.

2.2. Corruption Perception Index Methodology

Since 1995, Transparency International has released the CPI, which is regarded as one of the most prevalent instruments for assessing perceptions of corruption in the public sector. The index evaluates countries' corruption levels by measuring perceptions of the misuse of public authority for personal benefit (Transparency International, 2023).

The CPI is a composite index comprising data from business and expert opinions. The data used in the index is based on various surveys and assessments conducted by independent and credible organizations. These data comprehensively capture perceptions of public sector corruption and its

administrative and political aspects (Lambsdorff, 2007). Moreover, data sources with different scales are standardized before being included in the index (Thompson and Shah, 2005).

In 2012, updates to its methodology increased the transparency and accountability of the CPI. These changes enabled the index to have a broader coverage and provide information on more countries. According to the revised methodology, countries receive a score between 0 and 100, with 0 representing a high level of corruption and 100 representing the lowest perception of corruption (Berksoy and Yıldırım, 2017).

The sources used to construct the CPI vary according to each year's needs and data reliability. For example, the 2008 index was constructed with data from surveys of various organizations such as the Asian Development Bank (ADB), Economist Intelligence Unit (EIU), Freedom House, and the World Economic Forum (WEF) (Lambsdorff, 2005). The rankings of countries in the index are calculated by averaging the standardized scores provided by each source (Lambsdorff, 1999).

The CPI not only measures levels of corruption but also provides a tool for comparing countries' success in combating corruption. However, as a perception-based measure, it is also subject to criticism. For example, it is argued that the index does not adequately take into account local dynamics and reflects general perceptions rather than direct experiences of corruption (Rohwer, 2009).

Internationally, the CPI has been an important motivator for countries to step up their anti-corruption efforts. In addition, it has played an influential role in the ease of doing business and the level of economic development of countries by creating a reliable reference point for the business world and investors (Tsao and Hsueh, 2023).

2.3. International Cooperation in the Fight against Corruption

Corruption is considered a complex problem that needs to be addressed at the global level. In this context, international organizations, governments, and civil society organizations have developed comprehensive cooperation mechanisms to reduce the impact of corruption. In particular, the United Nations Convention against Corruption (UNCAC) provides one of the most comprehensive global legal frameworks in this area. The UNCAC strengthens coordination in this area by binding state parties to prevent and punish corruption and promoting international cooperation (Transparency International, 2007).

Furthermore, international financial institutions such as the World Bank and the International Monetary Fund (IMF) have emphasized the impact of anti-corruption on economic development and stressed the importance of supporting low-income countries in this regard. These institutions have implemented several programs and reform initiatives to enhance governance standards in developing nations (Koeswayo, Handoyo and Hasyir, 2024). Such activities are crucial in mitigating the impacts of corruption that hinder economic progress.

CPI, published by Transparency International, is a crucial tool that fosters international cooperation by evaluating global perceptions of corruption. The index offers guidance to governments and policymakers on the domains requiring advancement in the battle against corruption (Tsao and Hsueh, 2023). This approach facilitates the tackling of corruption on a global scale and the formulation of unified solutions.

2.4. Social and Macroeconomic Impacts of Corruption

Corruption is characterized as the exploitation of official authority for personal benefit, significantly affecting social, economic, and political frameworks. Transparency International (2007), publications highlight that corruption is a primary issue hindering economic growth. In developing nations, the primary causes of this effect are the inefficient utilization of public resources and the misallocation of investments to non-targeted sectors. These impacts result in significant issues at both macroeconomic and societal levels.

From a macroeconomic perspective, corruption has a deterrent effect on foreign direct investment (FDI). Wilhelm (2002) argues that corruption reduces investments by increasing investors' perception of risk. Preventing the flow of foreign capital not only negatively affects economic growth but also local economic efficiency, making it challenging to allocate resources efficiently. Lambsdorff (2007) argues that in countries where corruption is widespread, the growth rate decreases and income inequality increases. This shows the impact of corruption on economic and social inequalities.

At the social level, corruption increases income inequality and limits access to public services. Yaşar and Beşer (2018) argue that corruption reduces resources allocated to basic services such as education and health, and this effect is more pronounced for low-income groups. Moreover, this phenomenon leads to a decline in confidence in democratic values and weakens social trust (Transparency International, 2014). Thus, corruption is not only an economic but also a social and political problem.

In the political dimension, corruption is observed to undermine social justice by manipulating public policies. Transparency International (2007) states that corruption leads to serious injustices in resource allocation and creates insecurity in large segments of society. Especially in developing countries, political corruption is considered one of the biggest obstacles to economic and social progress. In this context, it is clear that corruption is a systemic problem, and its effects need to be addressed in a multidimensional manner.

The Fragile Five countries are among the countries where the perception of corruption has a profound impact on economic and social structures. In these countries, corruption not only hinders economic growth but also threatens social sustainability. The CPI reveals that perceived levels of

corruption in the public sectors of these countries are high, seriously hindering the efficient use of economic resources (Transparency International, 2023).

In Brazil, corruption undermines the effectiveness of public policies and increases the costs of public projects. Political corruption, in particular, significantly undermines government accountability and transparency. This leads to a decline in the quality of public services and a slowdown in economic growth. The increase in corruption cases has reduced the Brazilian public's trust in the state and caused social unrest (Efeoğlu and Emsen, 2021).

In India, corruption is widespread, especially in the public sector. This phenomenon, which makes it challenging to access basic services such as education and health, deepens inequalities in income distribution and deprives low-income groups of basic services (Iliman and Tekeli, 2014). This shows that corruption in India has a negative impact not only on economic growth but also on social equality.

In Indonesia, corruption stands out as an important factor hindering FDI. High levels of corruption increase the risk perception of foreign investors due to legal uncertainties and limit their investments. This leads to slower economic growth and higher unemployment rates (Buz and Erul, 2018). The Indonesian case demonstrates that corruption is a systemic problem hindering economic development.

In Turkey, the perception of corruption has increased in recent years, leading to a decrease in transparency in the public sector. This situation hinders the efficient use of public resources, weakens public trust in the state, and negatively affects the perception of social justice. Moreover, corruption limits the applicability of public policies (Usanmaz, 2022).

In South Africa, political corruption is a significant problem that directly affects social and economic development. Frequent corruption in public projects undermines social justice and reduces trust in democratic values (Transparency International, 2014; Efeoğlu and Emsen, 2021). This situation emphasizes the need for stronger policies and effective oversight mechanisms in the fight against corruption.

In conclusion, corruption in the Fragile Five countries creates serious problems in both economic and social areas. Inefficient use of public resources, barriers to access to social services, and weakening belief in democratic values are the main problems in these countries. In this respect, developing stronger anti-corruption policies and implementing effective oversight mechanisms is vital.

3. LITERATURE REVIEW

Studies examining the Corruption Perceptions Index (CPI) and its relationship with economic, social, and political indicators reveal the multidimensional nature of this index. Wilhelm (2002) and Papageorgiou et al. (2018) emphasized the positive impact of CPI on economic growth, demonstrating that improvements in corruption perceptions enhance per capita income and economic performance.

Similarly, Begu et al. (2019) highlighted the positive influence of GDP on CPI in Europe, emphasizing the close link between economic prosperity and corruption perceptions. Usanmaz (2022) argued that economic freedoms contribute to combating corruption in Turkey, although low CPI scores negatively affect development.

Konu and Ata (2016) and Şahin (2017) underlined the positive effect of increased economic freedoms on corruption perceptions, noting significant reductions in corruption levels. These studies demonstrate the critical role of economic policies in long-term anti-corruption efforts. Koçdemir and Yılmaz (2020) examined the impact of budget transparency on reducing corruption, emphasizing the pivotal role of improving governance quality. Domashova and Politova (2021) analyzed the relationship between CPI and economic freedom using machine learning methods, revealing how corruption perceptions are shaped by various economic factors.

Research on CPI's links with social and human development also presents significant findings. Alves et al. (2017) and Sarabia et al. (2020) identified a strong positive correlation between CPI and the Human Development Index (HDI), highlighting the beneficial effects of these indicators on social welfare and development. Sarabia et al. (2020) also noted that higher HDI and CPI scores mitigate social conflicts. Buz and Erul (2018) questioned the influence of education and urbanization rates on CPI, demonstrating that economic development plays a more prominent role. Yoon and Klasen (2017) explored the relationship between gender inequality and corruption perceptions, revealing that inequality exacerbates corruption levels.

Methodologically, CPI represents a critical tool for measuring corruption. Lambsdorff (1999, 2005, 2007) elaborated on CPI's methodology, highlighting its vital role in understanding cross-country corruption perceptions. Rohwer (2009) compared CPI with the World Bank's indicators, addressing the advantages and limitations of both tools. Ahmad and Aziz (2001) analyzed various corruption indices in terms of temporal consistency, showing that these indices produce similar results.

Studies focusing on the relationship between income inequality and corruption perceptions have unveiled the complex links between these variables. Erbuğa and Gürsoy (2023) analyzed this relationship in E-7 countries but found no causality. Berksoy and Yıldırım (2017) highlighted the negative effects of corruption on income inequality, noting that this situation harms Turkey's CPI ranking.

Ulman (2014) examined the positive correlation between CPI and national competitiveness, exploring how corruption perceptions influence economic performance. Tsao and Hsueh (2023) assessed CPI's effects across consecutive years, demonstrating that countries with low corruption levels tend to maintain this status. Melgar et al. (2010) investigated the impact of individual and societal factors

on corruption perceptions, emphasizing the role of income inequality and democratic satisfaction in shaping perceptions. Beşel (2014) analyzed changes in Turkey's CPI scores, highlighting improvements in corruption perceptions.

4. MODEL AND METHODOLOGY

This study analyzes the correlation between corruption perception and diverse economic and social indices in the Fragile Five (Brazil, India, Indonesia, Turkey, and South Africa) utilizing annual data from 2012 to 2020. The CPI serves as the dependent variable. The CPI is a metric that assesses the perception of corruption within a nation, particularly in the public sector, where elevated values signify a lower perception of corruption.

The independent variables in the study include FDI, GDPP, HDI, Palma ratio indicating income inequality, and unemployment rate. These variables denote economic, social, and structural elements that may affect the perception of corruption. The primary aim of the study is to elucidate the impact of these variables on the CPI and to comprehend the factors influencing corruption perception in the Fragile Five nations.

One of the most common issues in cross-sectional analyses is the problem of heteroskedasticity, which can significantly undermine the reliability of estimation results. This occurs when the variance of error terms is not constant, leading to incorrect calculation of standard errors and, consequently, biased parameter estimates. Such a problem makes it particularly challenging to accurately determine the effects of independent variables on the dependent variable. Therefore, addressing the impact of heteroskedasticity is critical to ensuring the validity and accuracy of the estimates.

In this study, to address the issue of heteroskedasticity, the "White heteroskedasticity-consistent standard errors & covariance" method was applied, as recommended in the studies by Konu & Ata (2016). This approach, developed by Wooldridge (2001), enhances the robustness of the model against heteroskedasticity, ensuring reliable standard error estimates. By applying this method, the model's estimates were corrected for the effects of heteroskedasticity, thereby improving the credibility of the results.

This methodology provides an effective solution frequently employed in cross-sectional analyses to enhance the validity of the estimates. Consequently, the application of this approach ensures that the findings are not only statistically robust but also theoretically reliable for drawing meaningful conclusions.

The heteroskedasticity-consistent covariance matrix method developed by White is a technique designed to address issues arising from the incorrect estimation of variances. This method aims to prevent misleading results in t and F tests when parameter variances are over- or underestimated. Although heteroskedasticity is not entirely eliminated, this technique minimizes the adverse effects

caused by incorrect variance estimation (Sümer, 2006, p. 19). The calculation of the heteroskedasticity-consistent covariance matrix proposed by White is carried out through the following steps (White, 1980, p. 817):

$$\widehat{\sum w} = \left(\frac{T}{T-k}\right)(X'X)^{-1}(\sum_{t-1}^{T} u_t^2 x_t x_t')(X'X)^{-1} \quad (1)$$

T → Number of observations,

k → Number of regressors (number of variables),

u_t → OLS residuals (error terms).

If the estimated error terms exhibit serial correlation (autocorrelation) and there are issues with both heteroskedasticity and unknown forms of autocorrelation, the Newey-West HAC Consistent Covariances (1987) method is preferred as a more generalized approach. This method is designed to correct the effects of autocorrelation and heteroskedasticity. The calculation procedure for Newey-West HAC Consistent Covariances is implemented as follows:

$$\widehat{\sum Nw} = \frac{T}{T-k}(X'X)^{-1}\widehat{\Omega}(X'X)^{-1} \quad (2)$$

$$\widehat{\Omega} = \frac{T}{T-k}\left\{\sum_{t=1}^{T} u_t^2 x_t x_t' + \sum_{v=1}^{q}\left((1-\frac{v}{1+q})\sum_{t=v+1}^{T} x_t u_t u_{t-v} x_{t-v}' + x_{t-v} u_{t-v} u_t x_t'\right)\right\} \quad (3)$$

Here, q represents truncation lags, and u_t denotes the OLS residuals (error terms). To determine q, Newey and West use the following formula:

$q = @floor(4(T/100)^{\frac{2}{9}})$ 'make use of this formula.

In the empirical analysis, cross-sectional analysis was conducted using annual data for the 2012–2022 period. The study examined the effects of selected variables presumed to influence the Corruption Perceptions Index (CPI) using the "Ordinary Least Squares (OLS)" method and a linear framework. For this analysis, cross-sectional methodology was employed to analyze variations among different country groups. Cross-sectional analysis allows the examination of variations across countries within a specific time frame, enabling the assessment of the impact of independent variables on the dependent variable. This approach offers the advantage of controlling for systematic differences between countries, thereby providing a clearer understanding of the factors that influence perceptions of corruption.

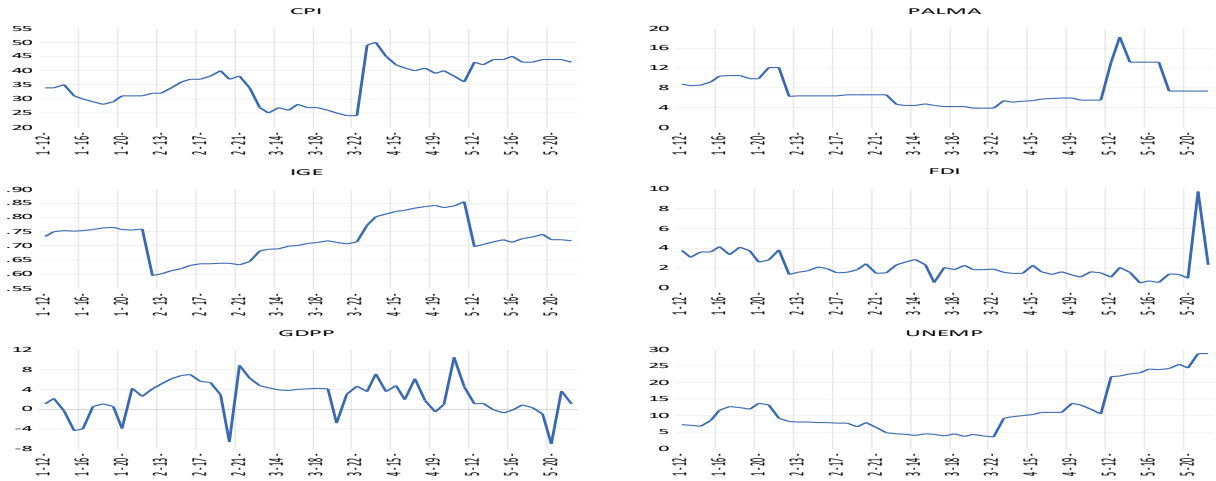
The mathematical expression of the model used in the analysis is presented as follows:

$$CPI_{it} = \alpha_i + \beta_{1i}PALMA_{it} + \beta_{2i}IGE_{it} + \beta_{3i}FDI_{it} + \beta_{4i}GDPP_{it} + \beta_{5i}UNEMP_{it} + \varepsilon_{it} \quad (4)$$

Here, CPI represents the Corruption Perceptions Index, while PALMA (Palma Ratio) is a measure of income inequality. The Palma Ratio is calculated by dividing the share of total income received by the richest 10% of the population by the share received by the poorest 40%. IGE denotes the Human Development Index, FDI represents net inflows of foreign direct investment, GDPP indicates the growth rate of per capita gross domestic product, and finally, UNEMP stands for the unemployment rate. In the

model, the notations β_0 and ε_t represent the constant term and the error term, respectively. The parameters β_0 to β_5 correspond to the coefficients of the explanatory variables included in the function. The graphs of the variables are presented in Figure 1.

Figure 1. Graphs of Variables Used in the Analysis



When the variables presented in the graphs are examined, the CPI generally exhibits a fluctuating trend, with sudden changes observed in certain years. This can be attributed to the periodic successes or failures of anti-corruption policies, as well as political and economic instability. Years with higher CPI values indicate periods when transparency and accountability mechanisms in public administration were strengthened, while years with declining CPI values are associated with events that heightened the perception of corruption. Within the framework of economic theory, low CPI scores reflect inefficient use of public resources, which can negatively impact economic growth and social welfare.

The PALMA, representing income inequality, demonstrates a relatively stable trend but exhibits sharp fluctuations during certain periods. Increases in the Palma Ratio highlight growing income disparities and a greater share of income accruing to the wealthiest segments of the population. Such fluctuations are more pronounced during economic crises or periods when economic policies fail to adequately support low-income groups. Particularly in developing countries, distortions in income distribution can directly influence perceptions of corruption, deepening social inequalities and eroding public trust.

The HDI generally shows an upward trend, reflecting gradual improvements in education, healthcare, and living standards within the Fragile Five countries. However, periods of stagnation or decline observed in some years can be associated with economic shocks or deficiencies in social policies. This trend in HDI is directly connected to the perception of corruption, as higher human development

levels are linked to the more effective delivery of public services, which can reduce corruption perception.

FDI exhibits a highly volatile pattern, with notable increases and decreases in certain years. These fluctuations can be explained by changes in the investment climate, political instability, or global economic dynamics. FDI plays a critical role in fostering economic growth. However, in countries with high levels of corruption, heightened risk perceptions among investors may result in disruptions to FDI flows. This graph supports the existence of a bidirectional relationship between FDI and corruption perception, highlighting how governance quality and transparency can influence investment decisions.

GDPP reflects patterns of economic growth and contraction, indicating the economic cycles experienced by the Fragile Five countries. The fluctuations in growth rates over the years highlight these countries' vulnerability to external shocks and economic crises. From the perspective of economic theory, economic growth can have a positive impact on the perception of corruption, as higher national income supports more efficient management of public resources and helps reduce corruption perception.

The UNEMP follows a volatile trend in the graphs, showing periods of both increases and decreases. High unemployment rates align with periods of economic contraction, leading to declines in societal welfare. According to economic theory, elevated unemployment exacerbates income inequality and contributes to a worsening perception of corruption. In particular, rising youth unemployment intensifies social unrest and economic inefficiencies, further complicating governance challenges.

When these graphs are examined collectively, the relationships between CPI and other variables offer significant insights into how economic, social, and structural factors influence corruption perception, aligning with economic theory. The year-to-year fluctuations in each variable provide a deeper understanding of the economic and social dynamics in the Fragile Five countries, shedding light on the multifaceted determinants of corruption perception.

4.1.Data Set

Descriptive information about the variables used in the analysis and the estimated effects of these independent variables on the dependent variable are presented in Table 1.

Table 1. Variables Table

Variable	Notation	Definition	Source	Expected Sign
Corruption Perceptions Index	CPI	Measures perceived corruption in the public sector	transparency.org	
Foreign Direct Investment	FDI	Net inflows of foreign direct investment (% of GDP)	worldbank.org	Positive
Per Capita Gross Domestic Product	GDPP	Per capita GDP growth (annual %)	worldbank.org	Positive
Human Development Index	HDI	Measures development in education, health, and income	hdr.undp.org	Positive
Palma Ratio	PALMA	Measures income inequality	ourworldindata.org	Negative
Unemployment Rate	UNEMP	Unemployment, total (% of total labor force, modeled ILO estimate)	worldbank.org	Negative

The CPI is an essential metric that assesses the perceived extent of corruption inside a nation's public sector. Expressed on a scale from 0 to 100, high CPI scores (e.g., 80-100) indicate very low or negligible levels of perceived corruption in the public sector. High CPI values are associated with the presence of the rule of law, transparent governance, and robust accountability mechanisms. Conversely, low CPI scores (e.g., 0-20) reflect a perception of widespread corruption, signifying poor governance, weak rule of law, and inadequate accountability frameworks. This scenario negatively impacts not only economic development but also social welfare.

FDI is a key indicator of a country's economic growth and development. Foreign investors typically prefer countries with transparency and low corruption risks. In this context, an environment with low corruption enhances predictability and attractiveness for investors. In countries with high CPI values, increased FDI inflows can positively influence economic growth. Thus, the rise in FDI contributes positively to CPI, supporting a reduction in perceived corruption.

GDPP is a critical indicator of a country's level of economic prosperity. Economic growth enhances the financing of public services and improves living standards within society. This creates a foundation for the expansion of transparency and accountability practices, contributing to a reduction in corruption perception. Additionally, rising income levels increase education and social awareness, leading to greater public demand for oversight of government actions. Consequently, an increase in GDPP generally has a positive impact on CPI, helping to reduce the perception of corruption.

The HDI measures a country's social indicators such as education, healthcare, and living standards. High HDI values reflect a society that is better educated, healthier, and more socially aware. This fosters increased demands for accountability and transparency in governance, positively influencing corruption perception. A well-developed education system and social structure also promote the adoption of ethical norms in the public sector. Thus, an increase in HDI has a positive impact on CPI, contributing to a decrease in perceived corruption.

The PALMA is a measure of income inequality, with higher values indicating increasing disparities in income distribution. Such inequalities can hinder the equitable delivery of public services, thereby heightening perceptions of corruption. In societies with high income inequality, perceptions that public resources are distributed unfairly and that wealthier segments have easier access to public resources tend to intensify. As a result, an increase in PALMA is expected to have a negative impact on CPI.

The UNEMP is a significant economic indicator that reflects how effectively an economy utilizes its labor force. High unemployment rates are associated with economic stagnation and societal dissatisfaction. This weakens public trust in governance and exacerbates perceptions of corruption. In countries with high unemployment, corruption cases in the public sector are more likely to become visible, further reinforcing negative perceptions. Therefore, an increase in unemployment is expected to negatively affect CPI and worsen corruption perception.

The relationships between CPI and economic and social indicators clearly highlight the impact of factors such as economic growth and social equity on corruption perception. Indicators such as FDI, GDPP, and IGE play a role in improving perceptions of corruption, whereas PALMA and UNEMP negatively influence it. Consequently, improving a country's CPI requires not only achieving economic growth but also implementing policies that enhance social equity and promote efficient labor force utilization. These efforts are essential for fostering both economic development and transparent governance.

4.2. Findings

These findings demonstrate that the model used in the study provides a reliable analysis and supports the theoretical and practical validity of the results. Thus, the accuracy and significance of the model in explaining the economic and social determinants of corruption perception are validated.

Table 2. Regression Results

Dependent Variable: CPI			
Variable	Coefficient	t-Statistic	p-Value
FDI	-1,188**	-2,458	0,017
GDPP	0,416**	2,011	0,049
HDI	14,486	1,427	0,159
PALMA	-0,180	-0,657	0,514
UNEMP	0,766***	6,340	0,000
Constant Term	19,309**	2,498	0,015
R^2	0,566		
F-Statistic	12,819		
Probability (F-Statistic)	0,000		

Note: ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

The estimation outcomes of the economic model employed in the study are displayed in Table 3. The dependent variable, CPI, yielded statistically significant results concerning the independent factors in the model. The R^2 value of the model was determined to be 0.566, signifying that 56.6 % of the total variation in the dependent variable is elucidated by the independent factors. The significance level of the F-statistic ($p = 0.000$) indicates that the model is statistically significant and that the independent variables together exert a substantial influence on the dependent variable.

The coefficient for the FDI variable was estimated at -1.188, and this result was found to be statistically significant at the 5 % level ($p = 0.017$). This finding indicates that an increase in foreign direct investment has a negative impact on CPI. This result can generally be associated with the institutional weaknesses and political vulnerabilities of these countries. While FDI is typically regarded as a tool expected to improve the investment environment, strengthen institutional structures, and enhance transparency, the sectors in which these investments are concentrated and the characteristics of the investment processes in fragile five countries cause this mechanism to operate in the opposite direction.

In particular, the concentration of FDI in these countries in high-corruption-risk sectors such as energy, infrastructure, construction, and mining increases corruption perception. The lack of transparency in tender processes in these sectors may lead foreign investors to resort to informal mechanisms to reduce their operating costs. For instance, criticisms regarding public tenders in Turkey or scandals such as Petrobras in Brazil demonstrate how FDI can fuel corruption mechanisms. Similarly, in Indonesia, cases where foreign investors have established non-transparent relationships with local governments in mining and deforestation processes explain the negative impact of FDI on the CPI.

This situation demonstrates that the effect of FDI depends not only on the volume of investment but also on the sectors it targets and how transparently these processes are managed. Additionally, the tendency of foreign investors in fragile five countries to exploit weak institutional structures to gain more advantages further strengthens the negative impact of FDI on the CPI. In conclusion, the underlying factors behind FDI increasing corruption perception rather than reducing it in these countries include institutional deficiencies, lack of transparency, and inadequacies in the regulatory processes of investments.

The coefficient for GDPP was estimated at 0.416 and found to be statistically significant at the 5% level ($p = 0.049$). The GDPP variable has a positive and statistically significant effect on CPI. This result is consistent with theoretical expectations and indicates that economic growth can improve the perception of corruption. Increasing per capita income can contribute to the more efficient management of public resources, strengthening transparency mechanisms, and improving institutional structures. However, in fragile five countries, the impact of growth may be limited; because economic growth, when not effectively addressing income inequality or promoting more inclusive policies, may only

benefit certain segments of society and fail to create a widespread impact. This situation can affect the magnitude and sustainability of the positive relationship.

For the IGE variable, the estimated coefficient is 14.486; however, this result was not statistically significant (p = 0.159). The IGE variable, despite showing the expected positive effect on CPI, is not statistically significant. This result suggests that the direct impact of human development levels on the perception of corruption is not evident in the short term. Improvements in dimensions such as education, health, and income in human development can have a positive impact on institutional structures, but this effect may take time. In fragile five countries, the fact that social reforms are often concentrated on specific groups may prevent a widespread change in the perception of corruption. Moreover, the weakness of institutional structures in these countries can limit the direct effects of human development.

The PALMA, a measure of income inequality, was estimated with a coefficient of -0.180 but was not found to be statistically significant (p = 0.514). PALMA, an important variable measuring income inequality, does not have a statistically significant effect on CPI. The indirect nature of the impact of income inequality on the perception of corruption may explain why this relationship is not apparent in the model. In fragile five countries, increasing income inequality can indirectly affect the perception of corruption by exacerbating social injustices and undermining institutional trust. However, the lack of a direct reflection of these effects on perceptions, as well as their masking by other economic or social factors, may have prevented the variable from producing statistically significant results. This situation suggests that the effects of income inequality on the perception of corruption are more closely tied to the general economic and social contexts of countries.

The predicted coefficient for the UNEMP variable is 0.766 and is statistically significant at the 1% level (p = 0.000). The UNEMP variable has a positive effect on CPI, and this effect is statistically significant. This result is inconsistent with theoretical expectations but can be explained by the differences in the social and economic dynamics of fragile five countries. The positive relationship between rising unemployment and CPI may indicate that individuals' priorities shift to economic concerns, reducing their sensitivity to the perception of corruption. Additionally, in some societies, corruption may be perceived as a "normalized" phenomenon, overshadowed by the perceived importance of factors like unemployment. This finding highlights the complex relationship between structural issues in the labor market and the perception of corruption in fragile five countries.

The coefficient of the constant term is evaluated at 19.309 and is statistically significant at the 5% level (p = 0.015). This denotes the baseline level of CPI when the independent factors exert no influence. In conclusion, while some independent variables (e.g., FDI, GDPP, and UNEMP) have significant impacts on CPI, others (IGE and PALMA) do not exhibit statistically significant effects. The overall explanatory power of the model (R^2 = 0.566) and the significance of the F-statistic confirm that the model provides reliable and meaningful analysis. These findings highlight that the impacts of economic

and social indicators on corruption perception occur at varying levels, underlining the complexity of their relationships. The resulting formula is as follows;

$$(CPI_i) = 19.309_i \pm 0.180_i(PALMA_i) + 14.486_i(IGE_i) + 1.188_i(FDI_i) + 0.416_i(GDPP_i) + 0.766_i(UNEMP_i)$$

5. DISCUSSION

This study examines the relationships between the Corruption Perceptions Index (CPI) and various economic and social indicators, providing a comparative analysis with the existing literature. The findings are largely consistent with prior studies, though some differences have been observed.

The positive relationship between economic growth and CPI aligns with the studies of Wilhelm (2002) and Papageorgiou et al. (2018). These works emphasize that economic growth improves corruption perceptions and enhances governance quality. Similarly, Begu et al. (2019) investigated the positive effect of GDP growth on CPI in European countries and supported this connection.

Regarding the relationship between income inequality and CPI, the findings of this study differ from those of Berksoy and Yıldırım (2017), who highlighted that income inequality negatively affects corruption perceptions. In contrast, this study found no significant impact of income inequality on CPI. However, Erbuğa and Gürsoy (2023) also reported no significant relationship between income inequality and CPI in E-7 countries. These differences may stem from variations in the economic structures of the countries examined.

On the relationship between the Human Development Index (HDI) and CPI, Alves et al. (2017) and Sarabia et al. (2020) emphasized that increases in HDI improve corruption perceptions. However, this study found no significant effect of HDI on CPI. Sarabia et al. (2020) highlighted the role of HDI and CPI in reducing social conflicts, which makes these differences notable. These discrepancies may be attributed to the economic and social differences among the countries analyzed.

The positive effect of unemployment rates on CPI has not been directly studied in the literature but is indirectly linked to the findings of Yoon and Klasen (2017), who examined how social inequalities influence corruption perceptions. This result indicates that high unemployment rates might warrant further investigation into their potential impacts on corruption perceptions.

In conclusion, this study contributes to the literature by exploring the relationships between CPI and economic and social indicators, shedding light on the role of country-specific factors in these dynamics. The observed differences with the literature emphasize the need for more detailed analyses of corruption perception dynamics within country-specific contexts.

6. CONCLUSIONS AND POLICY RECOMMENDATIONS

This study examines the relationships between corruption perception and economic and social indicators for the Fragile Five countries using data from the 2012–2022 period. The analysis, which employs the Corruption Perceptions Index as the dependent variable, reveals that factors such as foreign direct investments, economic growth and the unemployment rate have statistically significant impacts on corruption perception. However, indicators such as the Human Development Index and income inequality (PALMA) were not found to have significant effects on CPI within the scope of the model. These findings suggest that corruption perception is directly linked to economic growth and labor market dynamics, while the effects of social indicators may be more indirect and long-term.

This discussion on the alignment and divergence of findings with the literature provides valuable insights for developing policy recommendations. Firstly, policies that promote economic growth appear to be an effective tool for improving corruption perception. Strengthening transparency and accountability mechanisms in the public sector can enhance economic growth and the efficiency of public services, positively influencing corruption perception. Secondly, reforms aimed at combating corruption are critical for increasing foreign direct investment. Raising transparency standards and reinforcing the rule of law are essential for building investor confidence and fostering a more secure investment climate.

Considering the indirect effects of social indicators such as income inequality and unemployment on corruption perception, social policies should aim to ensure a more equitable income distribution and improve labor market efficiency. In countries with high unemployment rates, strengthening social support programs and expanding public employment opportunities can increase public trust in governance and reduce perceptions of corruption. Additionally, investments in education and healthcare to improve human development can play a significant role in combating corruption in the long term.

In conclusion, it is evident that the impacts of corruption perception on economic growth and social indicators vary across countries, highlighting the need for an integrated approach to economic and social policies in the fight against corruption. The Fragile Five countries should implement more comprehensive reforms to improve corruption perception and achieve sustainable development by adopting a policy framework that simultaneously addresses economic growth and social equity objectives. Within this framework, establishing the rule of law, raising transparency standards, and ensuring accountability in public administration will not only improve corruption perception but also support long-term development goals.

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