

The Relationship between Economic Growth and Income Inequality in Türkiye: A Post-Keynesian Interpretation Based on Kaldor's Theoretical Perspective

Araştırma Makalesi /Research Article

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ABSTRACT: This study investigated the association between economic growth and income distribution based on Kaldor's post-Keynesian theory of income distribution. The focus was on how the functional distribution of income was affected by macroeconomic dynamics and therefore Kaldor's industry-specific growth laws were not considered in the scope of the study. It was aimed to test if economic growth had an effect on inequality and what were the macroeconomic influence factors on such a relationship. Accordingly, annual data for the period 2006-2022 was used to test the short-run relationship between income inequality (as measured by the Gini coefficient) and a set of key macroeconomic variables like GDP per capita, growth rate, unemployment, inflation, schooling rate, and foreign direct investment. Augmented Dickey-Fuller (ADF) Test, Vector Autoregression (VAR) Model and Granger Causality Test were used for the purposes of analyses. The results indicated that the effect of growth on income inequality was positive in the short run. Nevertheless, it was seen that indirect effects including schooling rate and labor market dynamics were potential mechanisms through which growth could affect distribution. These results were reviewed in the light of Kaldor's post-Keynesian theory and underscored the importance of complementary socio-economic strategies for achieving inclusive growth.

Keywords: Growth-Inequality Relationship, Kaldor Model, Post-Keynesian Economics, Türkiye

Türkiye'de Ekonomik Büyüme ve Gelir Eşitsizliği Arasındaki İlişki: Kaldor'un Teorik Perspektifine Dayalı Post-Keynesyen Bir Yorum

ÖZ: Bu çalışma, Kaldor'un post-Keynesyen gelir dağılımı teorisine dayanarak ekonomik büyüme ve gelir dağılımı arasındaki ilişkiyi araştırmıştır. Gelirin fonksiyonel dağılımının makroekonomik dinamiklerden nasıl etkilendiğine odaklanılmış ve bu nedenle Kaldor'un sektöre özgü büyüme yasaları çalışma kapsamında değerlendirilmemiştir. Ekonomik büyümenin eşitsizlik üzerinde bir etkisi olup olmadığı ve böyle bir ilişki üzerinde makroekonomik etki faktörlerinin neler olduğu test edilmeye çalışılmıştır. Bu doğrultuda, gelir eşitsizliği (Gini katsayısı ile ölçülen) ile kişi başına GSYH, büyüme oranı, işsizlik, enflasyon, okullaşma oranı ve doğrudan yabancı yatırımlar gibi bir dizi temel makroekonomik değişken arasındaki kısa dönemli ilişkiyi test etmek için 2006-2022 dönemine ait yıllık veriler kullanılmıştır. Analizler için Augmented Dickey-Fuller (ADF) Testi, Vektör Otoregresyon (VAR) Modeli ve Granger Nedensellik Testi kullanılmıştır. Sonuçlar, büyümenin gelir eşitsizliği üzerindeki etkisinin kısa vadede pozitif olduğunu göstermiştir. Bununla birlikte, okullaşma oranı ve işgücü piyasası dinamikleri gibi dolaylı etkilerin büyümenin dağılımı etkileyebileceği potansiyel mekanizmalar olduğu görülmüştür. Bu sonuçlar Kaldor'un post-Keynesyen teorisi ışığında incelenmiş ve kapsayıcı büyümenin sağlanması için tamamlayıcı sosyo-ekonomik stratejilerin önemini altı çizilmiştir.

Anahtar Kelimeler: Büyüme- Gelir Eşitsizliği İlişkisi, Kaldor Modeli, Post-Keynesyen İktisat, Türkiye

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1. Introduction

The relationship between economic growth and income inequality should be investigated in-depth vis-a-vis economic theory and policy implications. The dynamic association between these two inputs are of critical importance for policy makers who aim to optimize welfare distribution and improve social justice in the course of economic development. Previous studies suggested a range of theoretical approaches regarding the impact of *economic growth* on *income inequality*. While the Kuznets (1955: 7) hypothesis suggested that the relationship between economic growth and income inequality was in the shape of an "*inverted-U*", others argued that growth could have both positive and negative effects on income inequality. The direction of this relationship is shaped by structural changes and institutional factors in the process of growth, particularly in developing countries.

An investigation of the effects of economic growth on income inequality in developing economies, including Türkiye, is considered essential for an assessment of economic and social policy. Despite the impressive economic growth figures in the last years, income disparities still pose a threat to sustained development gains in Türkiye. Accordingly, a study on the association between income inequality and economic growth, with consideration of macroeconomic indicators and social factors, can make a much-needed contribution to academic literature and government policy.

In this study, the relationship between economic growth and income inequality in the Turkish economy was investigated through econometric methods as inspired by the theoretical insights of the *Kaldor Model*, but not via a direct empirical test of the industrial growth laws thereof. Therefore, the main purpose of the study is twofold: to analyze the effects of macroeconomic indicators (such as GDP per capita, growth, unemployment, inflation, schooling, and FDI) on income inequality, and to investigate the causal relationships between these indicators. The research was supported by econometric methods, including the *Unit Root Test*, *VAR Model* and *Granger Causality Test*. Furthermore, the study results were interpreted upon comparison thereof with the theoretical framework of the *Kaldor Model*.

This study sought to better understand the interaction between economic growth and income inequality in Türkiye and to offer policy suggestions that could support sustainable development goals. The study results offer valuable insights for designing concrete measures to reduce inequality and promote inclusive growth.

2. General Status of Economic Growth and Income Inequality in Türkiye

The recent data on *growth*, *income distribution*, *education*, *unemployment*, *inflation*, and *foreign investment* suggests a volatile but dynamic structure in Türkiye. Below indicators provide critical information on the impact of *economic growth* on equitable distribution and the direction of the development policies.

Table 1 includes a summary of statistics for key macroeconomic indicators used in the analysis, including *Gini coefficient*, *GDP per capita*, *growth rate*, *unemployment rate*, *inflation*, *schooling rate*, and *foreign direct investment*.

Table 1: Statistics of Macroeconomic Variables (2006-2022)

	Mean	SD	Lowest	25%	50%	75%	Highest
Gini Coefficient	0.39	0.01	0.38	0.38	0.39	0.40	0.41
GDP per capita	40,167.1	40,539.8	11,483.6	15,964.3	30,056.2	46,201.99	176,650.7
Growth Rate	5.02	4.06	-4.82	3.01	5.04	8.43	11.44
Unemployment Rate	11.08	1.42	9.21	10.23	10.90	11.88	14.03
Inflation Rate	0.14	0.15	0.06	0.08	0.09	0.11	0.72
Schooling Rate	37.44	8.28	20.14	33.06	39.89	44.41	46.00
Foreign Direct Investment (%)	1.79	0.73	1.07	1.32	1.56	2.23	3.62

Source: Compiled by the author based on the macroeconomic indicators from TurkStat, World Bank, the Presidency of Strategy and Budget, Central Bank of Republic of Türkiye (CBRT), Ministry of Treasury and Finance and Ministry of Industry and Technology. All variables represent annual data for 2006-2022. GDP per capita is in billion USD, while the FDI rate refers to foreign direct investment inflows as a percentage of GDP.

Based on the TurkStat data (TÜİK, 2024a), the Gini coefficient declined to its lowest level (0.38) during the 2010-2014 period and rose to 0.41 in 2022. The mean value of 0.39 and the low standard deviation is indicative of relative stability in inequality over time. Nevertheless, the data show a worsening trend from 2022 onwards.

World Bank data (2024a) show that GDP per capita increased from USD 11,484 in 2006 to USD 176,651 in 2022. The high standard deviation (USD 40,540) and mean value (USD 40,167) indicate dramatic changes over time. The rapid increases after 2020 indicate a strong rise in the rate of economic growth.

Upon a review of the growth rates of the economy (Strategy and Budget Presidency of the Republic of Türkiye, 2024; TÜİK, 2022), the negative growth rate, which was -% 4.82 in 2009 due to the global economic crisis, reached its highest level of 11.44% in 2021. The average growth rate of 5.02% suggests that the economy tends to perform well outside of crisis periods. Nevertheless, the variability in growth rates strongly points out the role of external shocks and domestic economic policies.

In terms of employment, the unemployment rate (World Bank, 2024b) peaked at 14.03% in 2009 and dropped to its lowest level at 9.21% in 2012. The limited fluctuation in the unemployment rate during this period (a standard deviation of 1.42%) suggested that the capacity to create employment during the economic recovery process was limited.

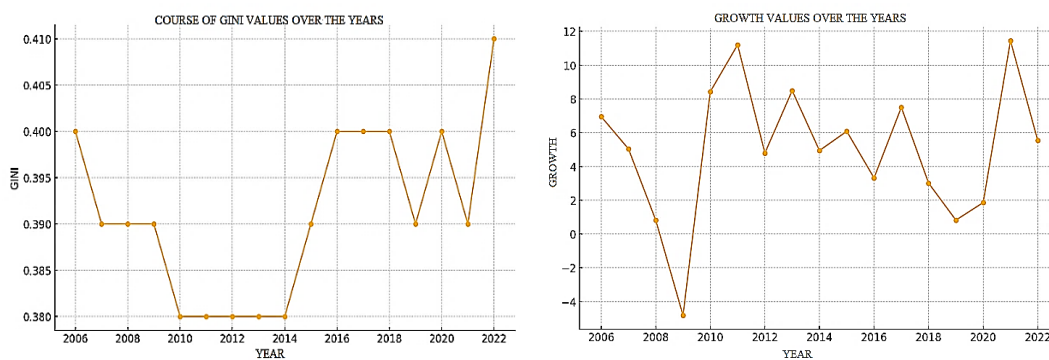
The inflation rates (TCMB, 2024) followed a low and stable course between 2006 and 2019 with a rapid deceleration after 2020. The lowest inflation rate was recorded in 2009 and 2011 (0.06%), and the highest inflation rate was recorded in 2022 (0.72%). The high standard deviation in inflation (an average of 0.14% to 0.154%) was indicative of the fact that there were significant fluctuations in terms of price stability.

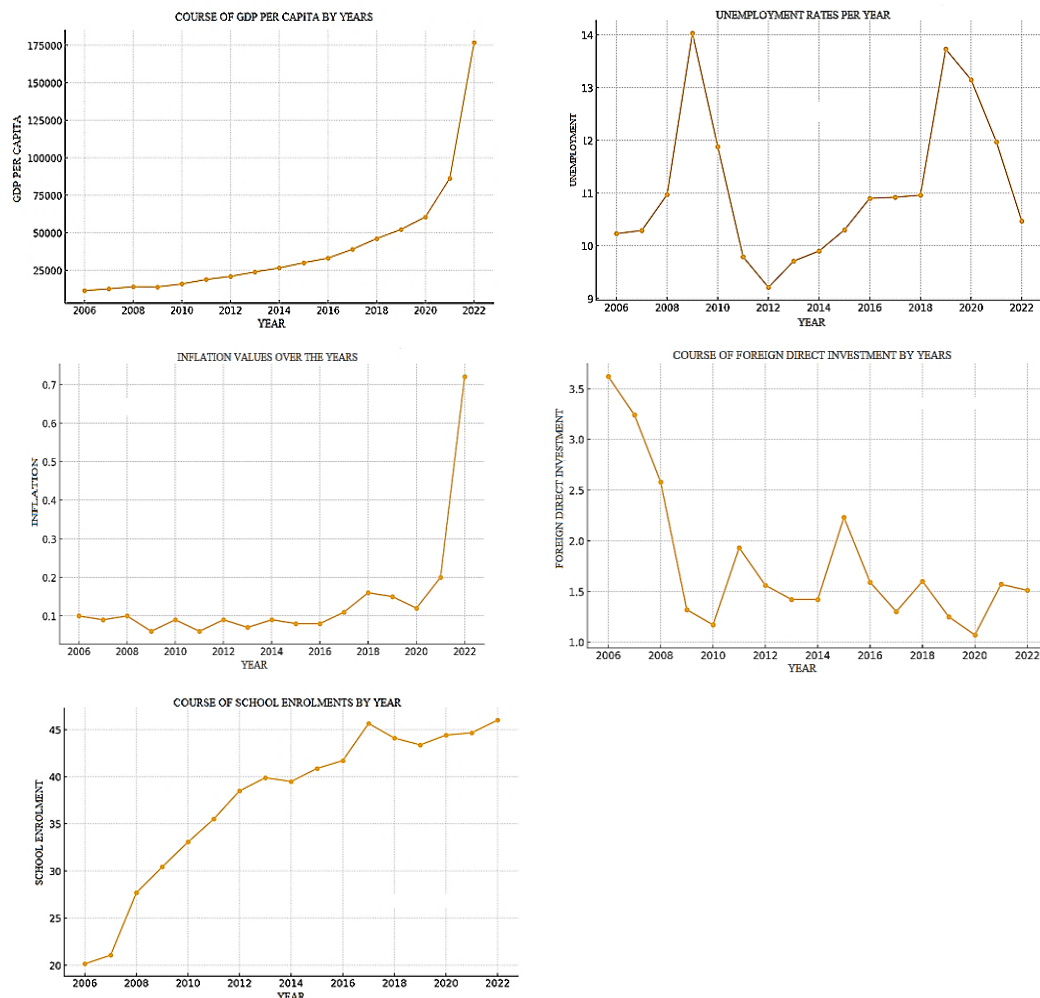
Developments in education were remarkable with a continuous increase in schooling rates (TÜİK, 2024b). The schooling rate increased from 20.14% in 2006 to its highest level of 46.00% in 2022. The average rate of 37.44% indicates the progress in education and the impact of investments.

Finally, there was a fluctuating course in Foreign Direct Investment (FDI) rates (Hazine ve Maliye Bakanlığı, 2022; Sanayi ve Teknoloji Bakanlığı, 2024). The highest FDI rate was recorded in 2006 (3.62%), and the lowest (1.07%) in 2020. In particular, FDI rates with an average rate of 1.79% were influenced by economic situation and conditions across the world. Foreign direct investment, measured in billion USD, shows fluctuations over time, indicating sensitivity to external economic conditions.

These indicators provide important data in understanding the general state of the Turkish economy and the effects of growth on income inequality. Despite the remarkable increase in income per capita especially during the periods of accelerated economic growth, there were occasional deteriorations in income distribution and economic indicators fluctuated independently of each other. This suggests that policies for sustainability and inclusive growth are required. The graphs of the indicators are given in Figure 1.

Figure 1: Time Series Graphs of Variable





2.2. Purpose, Scope and Limitations of the Study within the Framework of Kaldor Model

This study was based on the post-Keynesian interpretation of *Kaldor's* work, particularly with a focus on the macroeconomic relationship between economic growth and income inequality. Unlike the classical models which primarily relied on growth in labor force or capital accumulation, the Kaldorian framework offered a broader perspective by emphasizing functional *income distribution* and savings behavior. It presents *growth* and *inequality* as interrelated macroeconomic dynamics rather than separate phenomena.

The aim of this study was to investigate the effects of macroeconomic growth dynamics on income inequality in Türkiye within the theoretical context of the *Kaldor Model*. Instead of concentrating on sector-based productivity or the industrial sector, the analysis centered on broader economic indicators, including GDP per capita, inflation, unemployment, foreign direct investment, and education level. Therefore, the study sought to contribute to the literature by investigating

whether economic growth had a causal effect on income inequality in Türkiye and how this relationship aligned with the core assumptions of *Kaldorian distributional theory*.

This study had several methodological limitations. The analysis employed a *VAR Model* and *Granger Causality Tests*, which were suitable for identifying short-term dynamics between economic growth and income inequality. Nevertheless, as *Granger causality* was designed to capture only *short-term* causal effects, it might not fully reflect the *long-term* structural determinants of inequality. Alternative models, including *Vector Error Correction Model (VECM)* or *Autoregressive Distributed Lag (ARDL)* could allow for an investigation of long-run cointegration relationships. Nevertheless, as stated in the methodology section, *Unit Root Tests (ADF)* indicated that all variables used in this study were stationary at level (I(0)). Therefore, models which required integrated variables, including VECM could not be applied. Although long-term dynamics could not be investigated from an econometric perspective in this study, this limitation may serve as a basis for future research.

2.3. Research Question

This study investigated whether economic growth in Türkiye had an effect on income inequality and interpreted the results within the distributional domain of *Kaldor's theoretical approach*. Accordingly the study sought to answer the following questions: Does economic growth contribute to a reduction in income inequality? Is there a short-term causality relationship between the GDP growth rate and the Gini Coefficient in Türkiye? Are foreign direct investments and schooling rates effective in reducing income inequality? Do unemployment and inflation rates have an effect that increases income inequality?

These questions were addressed using macroeconomic data from Türkiye for a period spanning from 2006 to 2022. The study aimed to perform a comprehensive analysis of the causal and dynamic links between key macroeconomic variables and *income distribution* outcomes in the context of a post-Keynesian framework inspired by Kaldor.

3. Theoretical Framework

The central position of the industrial sector in economic growth has been a key point of contention in economic growth theories. In this context, the *Kaldor Model* provided an intriguing analytical model, introducing a new perspective to the interaction between growth and income distribution.

Nicholas Kaldor, one of the eminent early proponents of post-Keynesian economic theory, built a dichotomized theoretical framework which investigated the processes of economic growth and the functional distribution of income. On the one hand, this growth model which with a focus on industry, highlighted the central role of the manufacturing sector in stimulating productivity, employment creation, and long-term economic growth. On the other hand, the theory of *income distribution*

focused on the effects of capital accumulation, saving patterns, and demand systems on social inequality.

This section covers both theoretical perspectives to ensure conceptual clarity. Nevertheless, it is important to note that the present study did not empirically test the industrial-sector growth laws as proposed by Kaldor. Instead, it was built upon Kaldor's theoretical insights on how macroeconomic growth dynamics might affect *income distribution* and focused on a review of causality relationships at the macroeconomic level.

The following subsections are aimed first to outline the core principles of *Kaldor's industry-based growth laws*, and then explain the *income distribution perspective* which forms the theoretical basis of this study.

3.1. Basic Principles of the *Kaldor Model*

Nicholas Kaldor has been considered one of the leading figures of the post-Keynesian school, primarily for emphasizing the role of functional income distribution and saving behavior in long-run growth (Chandra and Sandilands, 2021: 323; King, 2016: 108; Alkin, 2012: 133). His theoretical approach departed from the neoclassical tradition upon a rejection marginal productivity theory and intertemporal optimization, and focusing instead on class-based saving tendencies and their impact on aggregate demand.

Drawing on Keynesian concepts, including effective demand and structural income flows, Kaldor developed a macroeconomic framework in which inequality functioned both as a consequence and a driver of economic growth (Kaldor, 1961: 178-179; Kaldor, 1957: 593). He also adopted the Harrod-Domar dynamic equation as a point of departure and strived for integrating classical and Keynesian insights into a unified explanation of growth and distributional dynamics.

Nicholas Kaldor's Growth Theory emphasizes the critical role of the industrial sector in economic growth, while suggesting the importance of the multiplier mechanism and increasing returns to scale (Kaldor, 1957). Kaldor argued that increasing returns to scale in the industrial sector created positive externalities which supported economic growth through capital accumulation and investment. The origins of the concept of increasing returns to scale in industry were based on the work by Solomon Fabricant (1942: 162) for the USA. Fabricant was the first scholar to statistically prove the existence of economies of scale in the industrial sector by demonstrating the positive correlation between labor productivity and output.

Kaldor's laws consisted of three laws used to explain the course of growth in the economy. These three laws had a certain extent of internal consistency. Growth in the industrial sector triggers growth in *Gross Domestic Product (GDP)*; the increase in production rates in the industrial sector increases the productivity in this sector and consequently contributes to the increase in productivity levels in other sectors. The basic principles of these laws are presented below (Mamgain, 1999: 296-298):

First Law: The growth rate of an economy has a positive relationship with the growth rate in its industrial sector. The industrial sector would create a multiplier effect and lead to growth. The opinion that the industrial sector is more productive compared to the agricultural sector is originated in Adam Smith. This opinion was based on the possibility of division of labor. The fact that a complete division of labor cannot be made across agricultural labor branches slows down the pace of productivity growth in this sector.

The mathematical expression of the first law is shown the following formula:

$$g_{nm} = \alpha + \beta g_m + \varepsilon \quad (1)$$

In this formula g_{nm} refers to the growth rate of the non-manufacturing sector; g_m to the growth rate of the manufacturing sector; and ε represents an error term with a normal distribution.

Second Law: The production increase rate in the industrial sector leads to an increase in labor productivity in this sector. As Kaldor (1966: 290) developed the *Export-Led Growth Model* based on Verdoorn's Law, this is known in the literature as the Kaldor-Verdoorn's Law (Millemaci and Ofria, 2014: 143; Castiglione, 2011: 162). Verdoorn (1993: 59) focused on the relationship between output growth, increasing returns, and productivity growth. The existence of increasing returns to scale in the industrial sector has been associated with multiple factors, including productivity increases by means of learning. Accordingly, expansion in the export sector promotes specialization in production and increases efficiency. Allocating the resources to a more efficient export sector is associated with an increased level of competitiveness as a result of reduced prices of commercial goods, which in turn supports exports and economic growth.

It is mathematically expressed as follows:

$$e_m = \alpha + \beta g_m + \varepsilon \quad (2)$$

In this formula e_m term refers to the employment growth rate in the manufacturing sector. Kaldor suggested that if the β term was significantly different from one, then employment should increase by less than 1% for every 1% increase in manufacturing output.

Third Law: As the production growth rate in the industrial sector increases, productivity in the non-industrial sector also increases. This law suggests that productivity increases in the industrial sector are transferred to the non-industrial sector. As the industrial sector increases its production output, it draws excess labor from other sectors of the economy (Abdioğlu and Yamak, 2016: 81). This reduces disguised unemployment and increases productivity in non-industrial sectors.

This relationship is mathematically formulated as follows:

$$P_{nm} = \alpha + \beta g_m - \gamma e_{nm} + \varepsilon \quad (3)$$

Here P_{nm} refers to the rate of increase in productivity in non-manufacturing sectors; where e_{nm} is the rate of increase in employment in non-manufacturing sectors. As stated above, g_m represents the growth rate of the manufacturing sector. β and γ coefficients are the terms that represent how changes in independent variables would result in a change in the dependent variable. ε is the random error term.

Therefore, *Kaldor's Laws* covers the impact of the industrial sector on the growth of the economy together with the productivity increases and changes in the employment structure and suggests the industrial sector as the main driving force of economic development.

3.2. Kaldor's Theoretical Perspective on Income Distribution

In addition to his industrial-sector-oriented growth model, *Nicholas Kaldor* also developed a theoretical approach which delved into the relationship between *growth and income distribution* through the lens of functional income shares. Within this framework, Kaldor emphasized the role of capital accumulation, savings behavior, and income shares between workers and capitalists in shaping macroeconomic outcomes (Kaldor, 1956: 83-84).

Built upon the Keynesian tradition, the model considers effective demand and *income distribution* as central drivers of growth. As originally emphasized by Keynes (1936: 120-121), unequal *income distribution* may suppress aggregate demand, thereby limiting growth potential in capitalist economies.

According to *Kaldor*, *income distribution* had an effect on aggregate demand and growth trajectories due to differences in marginal propensities to save. Capital owners tend to save a larger portion of their income, while workers spend a higher share. Consequently, shifts in income toward capital may raise aggregate savings and investment, but also widen inequality (Kaldor, 1956: 85-86). Nevertheless, if growth is accompanied by *full employment* and *rising productivity*, *income distribution* may improve indirectly by means of increased labor demand and rising wages (Pasinetti, 1974: 50-52).

Kaldor's insights align with post-Keynesian theories which link demand, investment behavior, and *income distribution* in a dynamic framework. His theoretical approach, particularly in the context of income distribution, saving behavior, demand-driven growth, and productivity dynamics, is a part of the post-Keynesian tradition. This approach is aimed to investigate how macroeconomic growth dynamics shape distributive outcomes, rather than focusing on technological or supply-side determinants alone (Lavoie, 2014: 200-202). In this context, Ryoo (2016: 430-432) extended the Kaldorian framework by incorporating the long-term effects of financial factors on income and wealth inequality. Ryoo emphasized how institutional elements -such as corporate dividend policies, the saving propensities of different income classes, and financialization processes could, over time, exacerbate inequality. This extended version of *Kaldor's theory* suggests that *income distribution* is influenced not only by productive forces

alone but also by macro-financial structures which interact with class-specific saving habits and investment flows. Furthermore, Romero (2016: 200-203) contributed to the *Kaldorian framework* by including Schumpeterian and structuralist perspectives with an aim to explain the determinants of long-term growth and productivity.

Romer emphasized that sectoral technological gaps, research intensity, and cumulative processes across industries should be considered to better understand the *income distribution* and development patterns. These factors shed a light onto the importance of a heterogeneous and dynamic treatment of productivity, in contrast to models which merely relied on uniform technological progress assumptions. While several scholars have extended the Kaldorian framework, others questioned its theoretical consistency and empirical applicability. Therefore, the robustness of *Kaldor's Model* has also been subject to academic debate. Harcourt (1963: 25-28) extended a notable critique, arguing that the model's conclusions were highly dependent on its underlying assumptions, and particularly those regarding class-based saving propensities and the functional distribution of income. He suggested that any change in these assumptions could render the growth and distribution dynamics predicted by the model invalid. This criticism suggested the need for care and a sense of structural context in the application of the Kaldorian approach, which, though theoretically insightful, required sensitive empirical treatment.

3.3. An Analysis of Economic Dynamics Specific to Türkiye in the Perspective of *Kaldor Model*

This study was theoretically based on this post-Keynesian interpretation of *Kaldor's* work. While Kaldorian industrial growth laws were not directly tested due to the absence of sector-specific data, the study drew upon his broader vision of the interaction between growth and inequality. The analysis tested short-run causality relationships between macroeconomic variables and income inequality in Türkiye, using econometric tools, including the *VAR Model* and *Granger Causality Test*.

The study's empirical strategy was built upon *Kaldor's* belief that economic growth could shape *income distribution* not only through structural shifts in production, but also through broader macroeconomic dynamics involving inflation, unemployment, human capital accumulation, and investment behavior (Hein, 2014: 120-123). Therefore, although the industrial sector was not the primary focus of this analysis, the study remained faithful to the spirit of *Kaldor's* theoretical contributions.

Based on the aforementioned theoretical insights, this section analyzes the macroeconomic dynamics of the Turkish economy in the light of *Kaldor's* broader framework and their potential effects on income inequality.

An analysis of the Turkish economy within the framework of the *Kaldor Model* could provide an important perspective to explain the effects of the industrial sector on economic growth and income distribution. Accordingly, the relationships

between macroeconomic indicators and income inequality in Türkiye can be discussed as follows:

Growth in the Industrial Sector and GDP: According to Kaldor, economic growth is largely based on growth in the industrial sector. The growth in the Turkish industrial sector can have an effect on *income distribution* by increasing income per capita. The study results suggested that *GDP* per capita and growth rate could have significant effects on the *Gini Coefficient*.

Productivity Increase and Economies of Scale: Kaldor suggested that productivity growth in the industrial sector could be achieved through economies of scale. It was seen that human capital indicators, including the schooling rate in Türkiye contributed to the growth in the industrial sector by increasing labor productivity. Increased levels of education could play a role in reducing income inequality.

Foreign Trade and Foreign Investments: In Kaldor's model, foreign trade and foreign direct investments were referred to as factors which could stimulate growth in the industrial sector. Foreign investments in Türkiye supported economic growth through technology transfer and capital accumulation in the industrial sector, yet they could also sustain indirect effects on income distribution.

The Effect of Unemployment and Inflation on Income Distribution: High unemployment rates are a major contributory factor to income inequality. *Kaldor Model* suggested that the expansion of the industrial sector could improve *income distribution* by creating employment. In the case of Türkiye, it was seen that industrial growth had the potential to reduce unemployment rates. High inflation had adverse effects especially on low-income groups, deepening income inequality. Therefore, ensuring macroeconomic stability in Türkiye is critical to reducing inequality.

4. Literature Review

Upon a review of relevant literature, there were multiple studies on the relationship between income inequality and economic growth. Nevertheless, most of the previous studies investigated the relationship between growth, income inequality, and *income distribution* and did not include a specific discussion in the context of the *Kaldor Model*. Therefore, only studies directly related to the *Kaldor Model* were reviewed and the results were systematically analyzed.

For the purposes of the literature review, “Kaldor model”, “Kaldor theory”, “growth theories”, “income distribution models”, “kaldor model”, “Türkiye”, “Türkiye”, “economic growth”, “growth”, “income inequality”, “growth theories”, and “income distribution models” keywords were used. In the scope thereof, studies available at academic databases, including Google Scholar, JSTOR, and Springer between 2006 and 2024 were reviewed. Accordingly, academic studies on *Kaldor's Growth Model* and theory in Türkiye and across the world were reviewed and the identified sources were classified as per author name, article name, method,

purpose, and results, and presented in tables. Thus, it was aimed to provide an original literature contribution in the context of the *Kaldor Model*.

Table 2 presents a categorized summary of key studies on the *Kaldor Model* and its relationship with economic growth and income distribution, including method, purpose, and findings.

Table 2: Literature Review Results

Author's Name	Method	Results
Alkin, E. (1970).	-	Kaldor's model makes an important contribution to explaining the effects of Keynesian theory on income distribution.
García-Peñalosa, C., & Turnovsky, S. J. (2006).	<i>Endogenous Growth Model</i>	Faster growth rate was associated with greater inequality in income distribution.
Çetin, M. (2009).	<i>Panel Data Analysis</i>	Kaldor's first growth law (the relationship between industrial sector growth and GDP) was valid for both Türkiye and EU countries.
Doruk, Ö. T. (2011).	<i>Panel Data Analysis</i>	Industrial production had a significant impact on economic growth and Kaldor's growth model was valid for developing countries.
Shin, I. (2012).	<i>Cross-Country Panel Data Analysis</i>	Economic growth reduces income inequality in the long run, supporting the idea that productivity-driven development may yield distributional benefits.
Arisoy, İ. (2013).	<i>Cointegration And Causality Tests</i>	There was a positive correlation between industrial sector growth and economic growth, and it was concluded that the Kaldor Law was valid for Türkiye.
Risso, W. A., Punzo, L. F., & Carrera, E. J. S. (2013).	<i>Granger Causality Test</i>	The results revealed a long-run cointegration between per capita GDP and the Gini index, with a unidirectional Granger causality running from economic growth to income inequality. This indicates that economic growth influences income distribution in the long term, but not vice versa.
Fawaz, F., Rahnama, M., & Valcarcel, V. J. (2014).	<i>Dynamic Panel Data Model, GMM Estimators</i>	Growth Granger-causes changes in income inequality in the short run; results vary by region but indicate a non-linear and country-specific relationship.
Hein, E. (2014).	<i>Theoretical Review</i>	Income distribution played a central role in economic growth dynamics and the structural relationships suggested by Kaldor were evident in growth models.
Kaya, A. (2015).	<i>Econometric Analysis</i>	The analysis suggested that Kaldor's First Law was valid for Türkiye and the industrial sector played a decisive role on economic growth. The study reported that the increase in industrial production was positively correlated with total factor productivity.
Amri & Nazamuddin. (2018).	<i>Pedroni's Co-Integration Test, Panel Vector Error Correction Model</i>	The study finds unidirectional causality from income inequality to growth in the short run and negative cointegration between growth and inequality in the long run.
Younsi & Bechtini. (2018).	<i>Panel Granger Causality Tests, Fixed Effects, Gmm Estimators</i>	It is found that there is no causal relationship between income inequality and economic growth in BRICS countries; there is unidirectional causality from financial development to income inequality; and bidirectional causality between inflation and inequality.

Table 2 (Contunied)

Arslan, F. P. (2019).	<i>Literature Review</i>	Kaldor's model provided a theoretical basis for explaining the relationships between economic growth and income distribution.
Kalita, A. (2019).	<i>Adf, Johansen Cointegration, Vecm, Granger Causality</i>	Long-run cointegration; Granger causality from inequality to growth; inequality supports growth via savings and capital accumulation.
Akgündüz, K. (2020).	<i>Econometric Analysis</i>	The results suggested that the growth in industrial sector had a significant impact on aggregate economic growth and Kaldor's growth laws were valid for the countries in question.
Sarıdoğan, H. Ö. (2020).	<i>Time Series Analysis</i>	It was concluded that there was a positive correlation between manufacturing industry production and economic growth and that the increase in manufacturing industry production supported economic growth.
Fanti, L. (2021).	<i>Agent-Based Stock-Flow Consistent Model</i>	Technological change had an effect on the decline of the wage share and the increase in income inequality.
Göcen, S. (2021).	<i>Panel Data Analysis</i>	In the models where the Gini Coefficient was used to represent income inequality, it was concluded that the relationship between economic growth and income inequality was U-shaped, contrary to the Kuznets Curve Hypothesis on a regional basis during the period of review.
Syafti, A. (2021).	<i>Granger Causality Test, Panel Data Analysis</i>	This causality study found bidirectional causality between income inequality and unemployment and unidirectional causality from economic growth to unemployment. There is no significant direct causality from growth to inequality, suggesting that employment acts as a key mediator.
de Sá Farias, E., & Teixeira, E. C. (2022).	<i>Dynamic Panel Data Estimation</i>	The study revealed a bidirectional causality between economic growth and income inequality at the national level. Notably, this relationship was more pronounced in less developed states, whereas in more developed states, only income inequality was found to influence economic growth. These findings suggest that public policies should focus on reducing regional disparities.
Erdoğan, M., & Telek, C. (2023).	<i>ARDL Bounds Testing</i>	It was concluded that there was a long-term positive correlation between industrial production and economic growth and that Kaldor's first law was valid for Türkiye.
Yağış, O. (2023).	<i>ARDL Bounds Testing</i>	It was suggested that there was a statistically significant relationship between industrialization and economic growth in the short and long term, and that industrialization contributed positively to economic growth.
Boyer, R., & Petit, P. (2024).	<i>Literature Review</i>	Discussed how Kaldor's growth theories evolved over time and how they could be applied for current economic conditions.
Deleidi, M., Iafrate, F., & Levvero, E. S. (2024).	<i>Panel Data Analysis</i>	It was reported that autonomous demand shocks had a positive effect on labor productivity and that expansionary fiscal policies could stimulate innovation.
Matsumoto, A., & Szidarovsky, F. (2024).	<i>Theoretical Modelling</i>	It was suggested that investment delays had significant effects on the dynamics of economic fluctuations.

Note: Compiled by the author.

Although many studies investigated the relationship between *economic growth* and *income inequality*, most focused on either the *Kaldorian industrial growth laws* or general macroeconomic interactions without an attempt to establish a direct link to

functional income distribution in the post-Keynesian sense. In particular, while certain studies, including Çetin (2009), Arısoy (2013), and Kaya (2015) confirmed industrial sector's role in growth (Kaldor's First Law), few addressed how this growth trajectory translated into distributional outcomes. Furthermore, a significant portion of the previous studies lacked an integration of inequality indicators (e.g. Gini Coefficient) into the Kaldorian framework, thereby overlooking the distributional implications of structural transformation.

As Table 2 illustrates, while a number of studies validated the growth-inequality relationship using various econometric tools, few explicitly related their results to *Kaldor's* distributional theory. For example, Risso et al. (2013) and Fawaz et al. (2014) identified a one-way causality from growth to inequality but did not frame their interpretation within a functional income share approach. Similarly, Amri and Nazamuddin (2018) focused on Indonesian data but stopped short of exploring the underlying structural channels. This study, on the other hand, aimed to address the above gap by incorporating *Gini coefficients* as dependent variables and assessing their short-run macroeconomic interactions, thereby bringing a distributional dimension to the predominantly growth-centered literature.

While previous studies often remained limited to validating the *growth-inequality relationship*, they fell short of offering a comprehensive explanation rooted in a structural macroeconomic framework. This study aimed to address this gap by integrating *post-Keynesian Distribution Theory* with modern econometric techniques -particularly *Granger causality* and *VAR models*- to investigate short-run and directional effects within economic structure of Türkiye. Rather than testing simple correlations, the analysis was based on *Kaldor's functional income distribution framework*, offering a theoretically informed and institutionally specific perspective.

In the light of the above-mentioned review of previous studies, many studies appeared methodologically robust but remained limited in terms of expanding the conceptual framework. Many focused solely on validating statistical associations between growth and inequality without adequately addressing the causal channels or the theoretical integration of inequality into macroeconomic frameworks. Particularly, the functional income distribution component of *Kaldor's theory* was frequently omitted or superficially addressed. This gap limited the explanatory power of such studies in capturing the complex dynamics of income inequality within structural economic settings.

Furthermore, this research contributes to the literature by empirically operationalizing the *Kaldorian Distributional Model* -rather than merely focusing on his growth laws- within the context of income inequality. By incorporating human capital, unemployment, and macroeconomic stability as mediating variables, the study provides a country-specific and nuanced understanding of how economic growth affects income distribution in a middle-income economy.

5. Methodology

In this study, the methods in use were chosen with an aim to statistically analyze the relationship between economic growth and income inequality. The definition of the methods and explanations as regards their importance are given below:

5.1. Definition and Importance of Analyses Used in the Study

Unit Root Tests are the basic econometric methods used to analyze whether *time series* are stationary. *Stationary* is when the mean and variance of the series do not change over time and is a critical requirement for reliable econometric analysis (Gujarati and Porter, 2009: 709). *Non-stationary* series may lead to misleading results and bias the analysis (Stock and Watson, 2015: 548; Enders, 2014: 52).

Unit Root Tests are applied to investigate whether a series contains a unit root. The presence of a unit root means that the series is non-stationary, while the absence thereof indicates that the series is stationary (Hamilton, 1994: 439). These tests are typically performed under three different model assumptions: models without constant and trend, with constant and without trend, and with constant and trend. Test results are interpreted with p-values; where a p-value below 0.05 is considered to have met the stationarity hypothesis (Granger and Newbold, 1974: 112). Stationarity can be achieved by using the differencing method in non-stationary series (Nelson and Plosser, 1982: 141).

The Augmented Dickey-Fuller (ADF) test is preferred for its ability to account for autocorrelation in time series data. In this study, the ADF test was used under different model specifications to test the stationarity of the series. Its robustness and effectiveness in small samples makes it a common choice in applied econometric research. Additionally, compared to other alternatives like the Phillips-Perron or Kwiatkowski-Phillips-Schmidt-Shin (KPSS) tests, the Augmented Dickey-Fuller (ADF) test offers a straightforward framework for handling different deterministic components, which aligns well with the structure of the current study. Given that non-stationary series may have an adverse effect on the validity of econometric models, the stationarity tests are considered crucial in analytical processes.

The Vector Autoregression (VAR) Model is considered a powerful econometric method used to analyze the dynamic relationships of multiple variables. This model is aimed at understanding the dynamics of interactions within the system over time upon investigation of the effects of past values of each variable on other variables (Sims, 1980: 1). Given that *VAR Model* accepts all variables as equal, it provides flexibility in modeling the mutual effects between endogenous variables without prioritizing any variable (Hamilton, 1994: 291).

Determining the appropriate number of lags is crucial for model accuracy. This number, which indicates the number of previous periods the model includes, is selected using information criteria such as AIC, BIC, and HQC (Lütkepohl, 2005: 67, 73). Nevertheless, an excessive number of lags can increase model complexity, while an insufficient number can lead to loss of information (Stock and Watson,

2015: 458). This method is a particularly appropriate tool for analyzing dynamic interactions between variables, including growth and income inequality.

The Granger Causality Test is used to test the ability of past values of one variable to predict future values of another variable. However, this test only suggests a statistical relationship rather than a direct causal relationship (Granger, 1969: 428). "Is X a Granger cause of Y?" This question is answered "yes" if past values of X provide a significant improvement in explaining the values of Y. Hypothesis tests are assessed using the p-values to determine whether this relationship is significant. For a p-value below 0.05, the causality relationship is considered statistically significant (Lütkepohl, 2005: 93).

The *Granger Causality Test* is considered an effective tool which has found frequent use in macroeconomic analyses. For instance, this method is widely applied in understanding the interactions between certain variables, including economic growth, inflation, and unemployment. Nevertheless, the results of the test only imply a time-related link between the variables and do not explain the causality mechanism (Gujarati and Porter, 2009: 713). Previous studies investigated the causal relationships between the *Gini Coefficient* and macroeconomic indicators (e.g. *GDP* per capita and unemployment rate) and their results provided important data in terms of evaluating the effects of growth policies on inequality.

5.2. Dataset and Data Sources

This study was based on the annual data on the Türkiye (2006-2022), with indicators summarized in Table 3. The FDI rate refers to foreign direct investment inflows as a percentage of GDP.

Table 3: Dataset and Data Sources

Variable	Definition / Unit	Source
Gini Coefficient	Income inequality index (0-1)	TurkStat
GDP Growth Rate	Annual % change in real GDP	Presidency of Strategy and Budget; TurkStat
GDP per capita	Real GDP per capita (constant USD, thousand \$)	World Bank
Unemployment Rate	Annual unemployment rate (%)	World Bank
Inflation Rate	Annual CPI-based inflation (%)	Central Bank of the Republic of Türkiye (CBRT)
Schooling Rate	Secondary education net enrollment (%)	TurkStat
Foreign Direct Investment	Annual FDI inflow (%)	Ministry of Treasury and Finance; Ministry of Industry and Technology

Note: Constructed by author.

5.3. Variables in Use and Econometric Model

This study investigated the short-term macroeconomic determinants of income inequality in Türkiye. Although the *Kaldor Model* emphasized the role of the industrial sector in driving *economic growth and structural transformation*, this study did not include sector-specific variables such as manufacturing output or industrial employment. Therefore, it did not aim to directly test *Kaldor's industrial growth laws*.

This analysis was based on *Kaldor's post-Keynesian theory*, which emphasized how macroeconomic factors, including GDP growth, unemployment, inflation, human capital, and investment, shaped income inequality dynamics. Accordingly, income inequality was taken as the dependent variable and measured by the Gini Coefficient. The independent variables were as follows: *GDP per capita* (thousand dollars), *GDP growth rate* (%), *unemployment rate* (%), *inflation rate* (%), *schooling rate* (%), and *foreign direct investment* (%).

The model used in the study is expressed by the following general equation:

$$Gini_t = \alpha + \beta_1 GDP\ Growth_t + \beta_2 Unemployment_t + \beta_3 Inflation_t + \beta_4 Schooling_t + \beta_5 FDI_t + \epsilon_t \quad (4)$$

This model was developed to investigate the effects of independent variables on income inequality. Here t refers to annual time period covering the period 2006-2022; α refers to the model constant term, the mean value of the dependent variable (*Gini Coefficient*) when the effect of other variables is zero; $\beta_{1,2,3,4,5}$ refers to the coefficients which express the effects of independent variables on income inequality (each coefficient represents the marginal effect of the relevant variable on the dependent variable); ϵ_t refers to the error term, represents other factors that cannot be explained in the model. This ϵ_t was assumed to have a random distribution. Furthermore, *Granger Causality Test* was used with an aim to test the causality relationships between variables.

6. Results

In this section, the results of econometric analyses were analyzed in detail and interpreted within the framework of the *Kaldor Model*.

Unit Root Test, *VAR Model* and *Granger Causality Test* were used to analyze the relationship between income inequality (Gini Coefficient) and economic growth. The relationship between the two variables was reviewed by a multidimensional approach.

Table 4 presents the results of the Unit Root Test. The *Unit Root Test* was used to test the stationarity of variables such as *Gini Coefficient*, *GDP per capita*, *growth rate*, *unemployment rate*, *inflation*, *schooling rate*, and *foreign direct investments*.

The results indicates that most of these variables were not stationary at level, but became stationary after taking the first or second differences. The *Gini coefficient*

was *non-stationary* at level but became *stationary* after first differencing. GDP per capita was *stationary* only in the model *without constant and trend*, whereas it remained *non-stationary* in the model with *constant and trend*. The growth rate was *non-stationary* in the model *without constant and trend* at the 5% significance level, but it was accepted as *stationary* in the model with *constant and without trend*. The unemployment rate was generally *non-stationary* but approached *stationarity* at the 10% significance level under the model with *constant and without trend*. Inflation was initially *non-stationary*; nevertheless, when the second difference was taken, it became *stationary* at the 5% significance level. The schooling was typically *non-stationary*, yet it was *stationary* only in the model with *constant and without trend* at the 10% level. Finally, the *foreign direct investment rate* was close to *stationary* at the 10% significance level in the initial specification and became *stationary* in the model with *constant and without trend*.

Table 4: Unit Root Test Results

	Without constant- Without trend		With constant- Without trend		With constant- With trend	
	Test Statistics	p-value	Test Statistics	p-value	Test Statistics	p-value
Gini Coefficient	0.51	0.81	-0.79	0.79	-1.53	0.77
D Gini Coefficient	-6.41	0.00	-6.17	0.00	-6.54	0.00
GDP per capita	-4.30	0.00	-1.73	0.40	1.14	1.00
Growth Rate	-1.91	0.06	-3.49	0.02	-3.29	0.11
Unemployment Rate	-0.21	0.60	-2.78	0.08	-2.65	0.27
Inflation	1.28	0.94	6.84	1.00	4.07	1.00
D Inflation	2.39	0.99	1.88	1.00	-2.66	0.27
D2 Inflation	-2.14	0.04	-2.20	0.22	-2.32	0.40
Schooling Rate	2.44	0.99	-2.90	0.07	-1.52	0.78
Foreign Direct Investment Rate	-1.66	0.09	-4.01	0.01	-3.68	0.06

In economic terms, the non-stationarity of most variables suggested that they were shaped by long-term structural factors rather than short-term fluctuations. Differencing was thus essential to ensure both statistical validity and meaningful interpretation. This long-run orientation in macroeconomic variables was conceptually compatible with *Kaldor's growth theory*, which emphasized structural transformation and gradual sectoral shifts over time.

The results of the optimal lag length selection for the VAR model are given in Table 5. Table 5 contains the results of various criteria used to determine the number of lags. To this end, various criteria were used to determine the best lag length for the *VAR Model*. These included the *Log Likelihood (LogL)*, *Likelihood Ratio (LR) Test*, *Final Prediction Error (FPE)*, *Akaike Information Criterion (AIC)*, *Schwarz Criterion (SIC)*, and *Hannan-Quinn Criterion (HQC)*. All of them pointed to lag 1 as the most suitable choice. At lag 0, the *LogL* value was -191.36, which showed a poor model fit. When lag 1 was used, the *LogL* increased to 147.40, meaning the model performed much better. The *LR test* result (290.37) also supported this

improvement as statistically significant. Likewise, the *FPE* reached its lowest at 0.00, indicating a drop in prediction errors. Moreover, the values of *AIC* (-13.06), *SIC* (-10.50), and *HQC* (-13.29) were all at their minimum when lag 1 was selected. Overall, choosing one lag seemed to offer the best fit for the model in the next stages of analysis.

Table 5: VAR Model Optimal Lag Number

Lag	LogL	LR	FPE	AIC	SIC	HQ
0	-191.36	n.a.	4789.43	28.34	28.66	28.31
1	147.40	290.37*	0.00*	-13.06*	-10.50*	-13.29*

From an economic perspective, this result suggested that the variables in the model interacted mostly in the short term. It also implied that any economic shock or policy action could quickly influence the system. While this interaction reflected short-term dynamics, it also aligned with *Kaldor's* acknowledgment that growth effects unfold with time lags, especially through certain mechanisms, including investment, employment, and structural adjustment.

This section summarizes the results of the Granger Causality Test as applied to examine the short-run causal relationships between income inequality (measured by the Gini coefficient) and selected macroeconomic indicators. The results suggested that there was no statistically significant causality from inequality to macroeconomic variables such as GDP per capita, growth rate, unemployment, inflation, schooling rate or FDI, nor vice versa. This suggested that in the case of Türkiye, the short-term macroeconomic fluctuations did not directly shape income inequality over the study period.

However, the test indicated some noteworthy short-run causal relationships among macroeconomic variables themselves.

Table 6 below gives a summary of the statistically significant short-run Granger causality relationships identified in the analysis.

Table 6: Significant Granger Causality Relationships ($p < 0.05$)

Causal Direction	F-Statistic	p-Value
GDP per capita $\Rightarrow$ Inflation	10.43	0.01
Schooling rate $\Rightarrow$ GDP per capita	7.44	0.02
Growth rate $\Rightarrow$ Unemployment rate	6.03	0.03

Note: Arrows represent the direction of Granger causality. Only statistically significant relationships at the 5% level were reported.

In particular, the test shows that GDP per capita Granger causes inflation ($p = 0.01$), implying a potential relationship between income growth and price levels. Also, the schooling rate was to Granger-cause GDP per capita ($p = 0.02$), proposing that improvements in human capital could act as a stimulus for economic development.

In addition, the rate of economic growth was Granger cause the rate of unemployment ($p = 0.03$), highlighting the importance of growth in driving labor market conditions. These results indicated the internal dynamic interlinkages of the economy, even though they did not directly arrive at income inequality. Upon a comparison with similar studies from other developing economies, Türkiye's results suggest both parallelism and divergences.

For instance, Shin (2012), similar to the results of the present study, reported that in a panel of 23 countries, economic growth tended to decrease income inequality over time, mainly through productivity improvements and broader access to opportunities. Risso et al. (2013) reported a unidirectional Granger causality from economic growth to income inequality in Mexico and suggested that *income distribution* was reacting to rather than influencing the growth dynamics. This suggests that, similar to Türkiye, economic growth might lead to changes in income inequality over time. Consistently, Fawaz et al. (2014) also identified a short-run causality running from growth to income inequality in developing countries, which supported the fact that growth might shape distribution even without direct feedback from inequality. In an Indonesian study, Amri and Nazamuddin (2018: 8) reported a unidirectional Granger causality from income inequality to economic growth for the period 2005-2015, again suggesting that inequality might stimulate growth through investment or consumption dynamics.

In contrast, Farias and Teixeira (2022: 190), who investigated Brazil with dynamic panel data (1997-2017), identified a *bidirectional causal relationship* between growth and inequality, highlighting a more complex feedback mechanism. Nevertheless, Younsi and Bechtini (2018), in their analysis of *BRICS countries*, reported *no significant causality* between income inequality and economic growth, suggesting that this relationship might differ substantially across emerging economies. Lastly, Syafti (2021: 123) demonstrated a short-run causal relationships between inequality, unemployment, and growth in Latin America, with a specific emphasis on how labor market factors mediate this interaction. This result aligned with the Turkish case, where growth had an effect on unemployment, indicating that labor market dynamics might be a more influential channel for distributional outcomes than growth alone.

A partial comparison can also be drawn with the results of Kalita (2019), who investigated the relationship between economic growth and income inequality in India from 1970 to 2013. The study identified a long-run cointegration and a short-run Granger causality from income inequality to growth. These results suggested that inequality, in the Indian context, might not necessarily hinder growth. While this contrasted with the results of the present study, where no short-run causality was seen in either direction, it highlighted that different country contexts might exhibit distinct inequality-growth dynamics. Thus, although the direction and significance of causality differed, the Indian case supported the broader observation that the interaction between these variables was complex and context dependent.

These cross-country differences underlined *Kaldor's* emphasis on the structural and institutional specificity of each economy, suggesting that generalizations on growth-distribution dynamics must have accounted for national development paths.

Following the assessment of the aggregate causality outcomes, it is important to investigate how economic growth can indirectly have an effect on income inequality through its relationship with other macroeconomic indicators.

Economic growth has a complex impact on *income distribution* inequalities. The short-run analysis indicated that there was no direct impact of *economic growth* on the *Gini Coefficient*. Its interaction with other macroeconomic factors, however, suggested potential indirect channels through which growth could influence *income distribution*.

In particular, the *Granger-causality* of enrollment ratio with *GDP per capita* implied that investments in education and human capital could support *economic growth*, which in turn might contribute to more inclusive development. This suggested Kaldor's broader theoretical position that long-term inclusive growth required complementary investments in human capital and job-creating sectors. Moreover, the causal relationship from economic growth to unemployment suggested that growth could play a role in improving labor market conditions. These dynamics might indirectly affect income inequality, although the analysis did not find a direct effect in the short run.

These empirical findings can also be interpreted within the broader theoretical framework of the *Kaldor Model*, particularly with regard to its *post-Keynesian* assumptions on growth and distribution.

Although this study did not include sector-specific variables and therefore did not directly test *Kaldor's industrial growth laws*, the results can still be discussed within the broader framework of *Kaldor's post-Keynesian theory of income distribution*.

In particular, the absence of a direct causal relationship between *economic growth* and *income inequality* was in contrast with the expectation that growth by itself would lead to a more balanced *income distribution*. However, indirect mechanisms, including the causal effect of schooling on *GDP per capita* and the role of growth in reducing unemployment supported the idea that structural macroeconomic dynamics could affect *income distribution* outcomes.

In this respect, the results are partly aligned with *Kaldor's* broad theoretical perspective emphasizing the role of human capital accumulation and macroeconomic balance in creating a fairer economy. These opposing relationships supported Kaldor's thesis that equitable growth could not be achieved through GDP growth alone but must have been pursued through a composite logic which included education, productivity and industrial deepening. While the present study did not explicitly focus on industry in this analysis, its results support the view that non-exclusionary social economic policies, including investment in education and job-

creating growth could prove to be useful tools for reducing inequality, which was consistent with Kaldor's holistic view of growth.

In particular, the absence of a unidirectional causality from economic growth to income inequality was inconsistent with the predictions of Kaldor's industry-oriented growth model. Nevertheless, indirect factors such as increasing macroeconomic stability and reducing unemployment rates suggested that growth-oriented policies might still support more equitable outcomes under certain conditions.

In conclusion, the econometric results suggested the existence of indirect mechanisms-particularly through labor market and educational channels-while failing to establish a direct link between *economic growth* and *income inequality*. To foster more inclusive development, policymakers should consider complementary socio-economic strategies, including inflation control and human capital investment, alongside *Kaldor-inspired, industry-led growth* approaches.

7. Discussion and Conclusion

The results of this study indicate that the relationship between economic growth and income inequality in Türkiye does not fully align with the broader theoretical expectations derived from *Kaldor's* perspective on income distribution. While *Kaldor's industry-led growth model* emphasizes the role of structural transformation and productivity increases-particularly through the industrial sector-this study does not directly test those mechanisms. Rather, it focuses on the short-term macroeconomic dynamics that may have an indirect effect on inequality. Accordingly, the absence of a causal relationship between GDP per capita and the Gini coefficient is associated with the limited inclusiveness of Türkiye's growth during the analyzed period.

Furthermore, the *Granger Causality Test* results show no evidence that economic growth has a direct short-term effect on schooling rates or income distribution. Although growth *Granger caused* the unemployment rate, this relationship did not translate into a measurable reduction in inequality.

Similarly, although statistically significant, the relationship between GDP per capita and inflation cannot be interpreted as a redistribution mechanism that effectively contributes to reducing inequality. Considered in combination, these results imply that economic expansion alone may be insufficient to alleviate income inequality in Türkiye without targeted institutional or social interventions.

Upon a comparison with previous studies, these results support the suggestion that investments in human capital, integration of social policies, and structural reforms are essential to improve the inclusiveness of growth in developing countries. In the context of Türkiye, the theoretical framework of the *Kaldor Model* may still offer valuable insights for industrial and productivity-driven strategies; yet, the model's assumptions do not hold empirically in terms of short-run effects on income

inequality. This indicates the need for a broader policy approach which incorporates both economic and social dimensions.

A general review of the empirical results within the framework of *Kaldor's post-Keynesian* perspective on *income distribution* suggests that the relationship between *growth* and *inequality* in Türkiye is complex at both theoretical and practical levels. Unit root test results indicate that the *Gini coefficient* becomes stationary only after first differencing, suggesting the dominance of long-term dynamics. *Granger Causality Tests* further indicate no direct causal effect from income inequality to macroeconomic indicators or vice versa, except for a few macro-level interactions. The fact that the schooling rate Granger causes *GDP* per capita suggests that improving human capital may support economic growth, which in turn could have indirect implications for income distribution.

In light of the study's results, some policy suggestions can be made to make sure that the link between economic growth and income difference in Türkiye is more fair and lasting. Focus should go to education and training investments since raising the school attendance rate, especially in poorer places, can boost personal earnings and cut down on inequality. The results of the *Granger Causality Test* further support that higher school rates have a big good effect on economic growth which highlights how key education is for creating inclusive and lasting development. In line with *Kaldor Model's* focus on industry-led growth, policies that back technological progress and help industrial output can spark sectoral progress and assist in reducing income gaps. Price stability and macroeconomic balance also play important roles as keeping inflation in check can indirectly improve income equality meaning that monetary policy design should think about distribution effects. Also, working job plans and help policies for people, especially those aimed at young jobless folks, can greatly help cut down on unfairness. Finally, area growth plans backed by building investments should look to lessen income gaps between areas and support a fairer type of money growth across the nation.

In conclusion, this study shows that the link between *economic growth* and *income inequality* in Türkiye is complex and cannot be explained by growth factor alone. While the *Kaldor Model* offers instrumental theoretical insights, addressing inequality requires broader strategies, including social, institutional, and regional development policies. In particular, strengthening human capital and controlling inflation emerge as important policy tools. However, it should be noted that due to the stationarity of the variables at level, the analysis was limited to short-run dynamics using the *VAR Model*. As a result, long-run effects on income inequality could not be captured within the scope of this study. This methodological limitation presents an opportunity for future research employing cointegration-based models such as *VECM* or *ARDL*.

Later studies might look into these changes more using local and job data. Following Kaldor's view on income sharing, this kind of research could also check

structural ways like type of industry, shifts in jobs, and school-driven work output that might indirectly affect money gaps over time.

In summary, the proof shows that building a fair and lasting growth in Türkiye needs a mixed policy plan that looks at different types of problems, such as basic, social; and local gaps. Bringing these steps together into a clear long-term plan would not just boost money performance but also make sure there is a fairer share of its gains across the community.

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