
THE INFLUENCE OF FOREIGN DIRECT INVESTMENT ON HUMAN DEVELOPMENT-A CONVENTIONAL STUDY - TURKEY AS A CASE STUDY - FOR THE YEARS 1970-2020

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Abstract

There are numerous examples of development and sustainable development, as well as the impact of foreign direct investment on human development, which ultimately leads to the development and development of the economy. Foreign investment is one of the most important external economic indicators that has an effect on the economies of the countries that are serving as hosts. As a result, the research utilized econometrics analysis in order to determine the capacity of foreign direct investment to bring about the necessary change. Econometrics models that represent the variables of human development and economic development were estimated. The purpose of this study was to determine the impact that foreign direct investment has on development and human development in Turkey. It was shown that there is a connection between economic progress, human development, and foreign direct investment from other countries.

Keywords: Foreign Direct Investment (FDI), Human Development, Economic Growth, Sustainable Development, Econometric Analysis.

Introduction

Economic crises impede national growth, and isolationist measures have demonstrated ineffectiveness. To foster economic aid, financial empowerment, and productivity improvement, foreign direct investment must be properly matched with governmental programs. This investment must also tackle educational and environmental issues. Regulations in major countries emphasize environmental conservation and pollution reduction. This investment enhances the economy's ability for sustainable living, alleviates internal crises, reduces poverty rates, diversifies production, and maintains resource flow without depletion. The international community has concentrated on controlling the effects of foreign direct investment on development and sustainable development, in conjunction with international economic conferences [1].

The correlation between investment and development is vital in economic theory, with foreign investment significantly contributing to the expansion of international trade and the modernization of national economies. Nations frequently depend on external investment to

upgrade production infrastructure and other elements of their economy. Foreign investment can mitigate resource deficiencies, broaden investment foundations, and enhance the balance of payments by augmenting exports and substituting imported commodities with domestically produced alternatives. It also facilitates the transfer of sophisticated management, training, production, marketing, and technology, thereby generating employment possibilities and enhancing the efficacy of the national workforce. Development seeks to enhance human life quality while taking into account the ecosystem's capacities and possibilities [2-6].

Improving our ability to design and implement sustainable development practices paves the way for a society and economy that can realize the global goal of economic prosperity. As we've already mentioned, this isn't going to happen unless there's funding and the government can boost public spending with the private sector. In order to end the never-ending economic cycles that impede development, sustainable development, and economic advancement, it is essential for economic policies to attract foreign direct investment. Consequently, the origins of FDI in development and sustainable development are crucial considerations while doing research in this area [7-10].

The premise of the study is that FDI guided by clear and adaptable regulations may boost economic growth and contribute to sustainable development. Based on the above, the research aims to accomplish multiple objectives related to the following: first, to conduct a quantitative analysis of the impact of FDI and government education spending on GDP; second, to estimate and analyze behavioral models of the impact of FDI on government spending on secondary and higher education; and finally, to test the hypothesis.

1. Economic development in Turkey: a historical perspective.

The Turkish economy has exhibited growth and progress. Upon the establishment of the republic in the 1920s, Turkey was predominantly an agrarian nation. Under governmental oversight, the quantity of factories rose from 118 in 1923 to over 1,000 by 1941. Currently, Turkey hosts more than 30,000 factories. Nevertheless, agriculture continues to be a crucial economic sector, employing 58% of the nation's entire workforce. Agricultural output is merely around 20% of the total value of goods and services generated in Turkey. Industry employs roughly 11% of the nation's overall workforce, while the value of industrial output surpasses that of agricultural output [11,12].

In Turkey, the government possesses ownership of all communication channels, railways, airports, and various public utilities. The state exerts control over the steel and mining sectors, forestry, the majority of banking operations, and around 400,000 hectares of agricultural land. The majority of farms, small factories, and construction companies are owned by the private sector. Since 1963, the state has directed the development of the national economy via a succession of five-year plans. The government seeks to enhance the involvement of the private industrial sector in the national economy [13].

The industrial and commercial hubs of Turkey are primarily located in the Istanbul metropolitan area and other significant cities, particularly in the western region. A substantial disparity exists in the standard of living and economic conditions between the industrialized west and the agrarian east. The agriculture sector is the predominant employer, engaging over

40% of the nation's workforce, while it contributes merely 12% to the gross domestic product (GDP). The industrial sector contributes approximately 29.5% to Turkey's GDP, while the services sector accounts for over 58.5%. The industrial sector employs 20.5% and the services sector employs 33.7% of the total employment. Since 1996, a customs union has existed between Turkey and the European Union, with Turkey's exports to the EU constituting around 51.6% of its overall exports [14-16].

Government economic policy focused on domestic economics from 1945 until the early 1980s. The program restricted foreign corporations and imports to protect native firms. Bureaucratic inefficiency and corruption hindered exports, while government income for industrial improvement and purchase of vital commodities and raw materials were limited. The Turkish public sector was poorly regulated. Politicians also used it for social and political purposes. A uniform sales tax was imposed on certain public sector enterprises' products, which provided a shelter for the unemployed when they did not need more labor. In several cases, the government had to exceed its five-year expenditure forecasts, resulting in expenditures rather than revenues.

Depreciation of the Turkish currency occurred as a result of rising inflation, the budget deficit, and the country's external debt; sometimes, inflation rates reached double digits. State spending rose, crippling the economy, as a result of the uncertain domestic political climate and military confrontations in Cyprus and the Kurdish regions. Over a million Turks were employed by foreign companies by the mid-1970s, a figure that had risen sharply during the 1960s. As a result of their remittances, they started to help the Turkish economy grow unofficially. Regardless, Turkey's economy grew steadily and at a high rate, with 6.7% growth in the 1950s and 4.1% in the 1970s, to name a few examples. Following the secularization of the Turkish government in 1982, the country's economy shifted its attention to exports, import restrictions were lifted, and Western investment was welcomed. After that, the administration backed private companies and pushed for privatization in the public sector [17,18].

Turgut Özal became the president of Turkey in 1989. His administration was characterized by the privatization of the Turkish economy, which enhanced diplomatic relations with the West, especially the United States. Özal implemented an open-door policy in the Turkish economy, liberalizing it by removing numerous constraints and privatizing the majority of state-owned firms. He successfully elevated the economic growth rate from 3.3% in 1983 to 9.1% in 1990 and augmented exports from \$5.7 billion in 1983 to \$11.6 billion in 1989. The ramifications of his foreign policy were manifest in the escalation of exports, the proliferation of contracts for Turkish contracting firms—predominantly in Gulf and other Arab nations—and the surge in foreign direct investment, which rose from \$113 million in 1984 to \$663 million in 1989, ultimately reaching approximately \$8,374 million in 2020. The peak foreign investment during the analyzed period occurred in 2007, totaling around \$22,047 million [19,20].

A dramatic drop in the value of the Turkish lira and a spike in inflation followed the country's three major economic crises in 1994, 1999, and 2001, respectively. The governments that were in power were brought down by the economic downturn on multiple occasions. Inflation dropped into the single digits for the first time in 2004 after having hovered over 150% in

1994 and 1995. Since the country was officially recognized as a candidate for full EU membership in 1999, the economy has been steadily improving, investor confidence in the government's reforms has been building, and prospects for full membership have been growing. The Turkish lira, which was replaced by the new currency, on January 1, 2005, was introduced into circulation. In 2004, the personal income of each citizen was \$4,172, while their buying power was \$7,400. Nearly two hundred billion US dollars was the GDP in 2004, while thirteen and a half billion dollars, or 78% of GDP, was the external debt ratio in 2002. Between 1970 and 2020, the Turkish economy saw tremendous growth, with the gross domestic product (GDP) increasing from 17 billion dollars to 600 billion dollars. This translates to higher government spending on education across all domains, particularly in agriculture and industry [21-24].

2. A conceptual model of human development

3.1 Elements of sustainable human development

The Human Development Report, published in 1995, underscored the necessity of augmenting human potential as a fundamental objective of sustainable human development, highlighting the following components:

- Productivity refers to individuals' capacity to participate in productive and creative endeavors.
- Equality refers to the provision of equal possibilities to all societal members, devoid of barriers or discrimination based on race, gender, financial level, origin, or any other status.
- Sustainability involves safeguarding future generations from the adverse effects of natural resource depletion, environmental pollution, public debt imposed on them, and neglect of human resource development, which may lead to challenging circumstances due to current decisions.
- Empowerment: Development is realized by individuals, not merely on their behalf. Consequently, people must engage comprehensively in the decisions and behaviors that influence their life. The significance of civil society organizations is especially evident in this context [25].

Therefore, necessary human development aims to improve people's lives now and in the future by coordinating development with institutional technology in a manner that maximizes potential, sustainability, equality, and empowerment to fulfill people's wants and fulfill their dreams. It acknowledges the importance of economic growth but stresses the need to monitor its sustainability, distribution, quality, and relevance to people's lives. In recent years, the UNDP has worked to expand the definition of sustainable human development by creating new metrics to gauge a country's economic well-being. These metrics supplement the more traditional measure of economic development, which is national income, and include the following:

- Environment and resource conservation and pollution reduction.
- Maintaining human capital in all its forms, guaranteeing that everyone has health and educational resources and can participate in the economy and society.

- Building community capital, the regulatory framework for community relations based on good governance, accountability, fairness, and justice in resource distribution and decision-making [26,27].

Human development constitutes a multifaceted interrelated framework encompassing economic, human, environmental, and social dimensions. It is not merely the aggregation of these things but the outcome of continuous interactions and relationships. The notion developed over time, emphasizing welfare, social advancement, education, training, rehabilitation, poverty reduction, and economic transformation. Human development aims to enhance physical, cognitive, and social competencies. Criteria for assessing these capabilities are essential to evaluate developmental progress and guarantee sustainable human development.

3.2 FDI and its effects on sustainable development aspects

Foreign direct investment (FDI) has both advantageous and detrimental consequences, and it is incumbent upon host governments to optimize FDI utilization to serve as an engine for development. Attracting foreign direct investment (FDI) has become progressively vital for developing nations, frequently predicated on the unspoken premise that heightened FDI inflows will confer advantages to the national economy. The effect of FDI is contingent upon its classification. The dimensions of sustainable development are widely recognized as four: economic, social, environmental, and institutional. The following illustrates the impact of FDI on these dimensions [28,29]:

- Foreign direct investment and its impact on economic development, Improving the balance of payments, raising exports, and raising enterprise quality are all ways in which foreign direct investment (FDI) can boost domestic industries. Research by M. Talha Atik and Hung Tran (2008) and Tun Wai and Wang (1982) demonstrates that this investment increases productivity, fortifies competitiveness, and decreases unemployment. According to studies conducted by the Brookings Institution, FDI boosts host economies by creating local investments equal to FDI dollars. On the other hand, there are environmental issues and economic dependence on foreign nations that direct investment can bring about [30-32].
- Foreign direct investment substantially enhances social development by generating new employment possibilities for local labor, diminishing unemployment in emerging nations, and augmenting social capital through the infrastructure development of enterprises. It also mitigates brain drain in emerging countries by enticing competent workers to remain employed domestically rather than emigrating overseas. This investment may influence worker training, pay, and the manufacturing of advanced products, thereby impacting the social conditions of the host nation.
- Foreign Direct Investment and the Institutional Dimension; this aspect of foreign direct investment encompasses the transfer of technology, technical expertise, competencies, and managerial skills, alongside the introduction of cleaner, superior, and more suitable technologies to facilitate sustainable development [11]. A clear correlation exists between foreign direct investment and sustainable development, as both pertain to similar economic and social challenges [6]. Consequently, foreign direct investment can assist sustainable

development if administered in accordance with sustainable development criteria. This will facilitate sustainable economic growth through the utilization of clean technology.

3.3 The connection between foreign direct investment and sustainable human development.

The Foreign direct investment (FDI) can substantially enhance sustainable development; nonetheless, it necessitates considerable work for integration into national strategies. The United Nations Sustainable Development Division has established indicators to assess sustainable development, encompassing the National Strategy for Sustainable Development and the execution of international sustainability treaties. Nonetheless, economic openness, market liberalization, and stringent regulations cannot ensure that foreign direct investment will promote sustainable development objectives. National sustainable development policies ought to emphasize the enhancement of national capacities and the expansion of local markets. A strong relationship between investors and host nations is crucial for maintaining equilibrium between the interests of investors and those of the host countries. The World Summit on Sustainable Development advocated for foreign direct investment to bolster national financial resources and private sector initiatives, considering economic, social, and environmental goals. The Earth Summit in 2002 asserted that foreign direct investment (FDI) may spearhead sustainable development by securing and sustaining FDI flows, exhibiting social responsibility, and adhering to environmental standards through commitment to international accords.

3. Data utilized

As shown in Table 1 the following table, data on foreign investment, GDP, and government spending in Turkey was collected over a span of about 51 years. The data was primarily focused on the effects of current FDI and the proportion of GDP that the Turkish government spent on secondary and higher education.

Table 1: Turkish GDP, FDI, and government expenditures on education for the period 1970-2020.

Years	GDP current US\$	FDI Current US\$(Million)	Exp. on secondary education (% Gov. Exp.)	Exp..on tertiary (Gov. Exp.%)
1970	17086.96	58	37.5	17.5
1971	16256.62	45	37.1	17.9
1972	20431.09	43	36.9	18.5
1973	25724.38	79	36.5	18.66
1974	35599.91	64	37.5	18.76
1975	44633.71	114	36.5	18.9
1976	51280.14	10	35.9	18.91
1977	58676.81	27	35.2	19.05
1978	65147.02	34	35.07	19.10
1979	89394.09	75	38.99	12.95
1980	68789.29	18	32.45	21.2
1981	71040.01	95	22.99	31.30

1982	645463.33	55	27.60	28.01
1983	616782.81	46	28.06	26.21
1984	599899.09	113	22.09	26.48
1985	672349.48	99	22.42	26.66
1986	757280.1	125	23.78	23.002
1987	871727.89	115	23.98	24.5
1988	908528.14	354	24.21	23.6
1989	1071433.49	663	23.56	23.7
1990	1506762.91	715	22.87	23.21
1991	1500278.33	801	23.14	238
1992	1584591.31	844	22.58	24.5
1993	1801697.36	678	23.66	25.18
1994	1306901.72	608	21.42	36.26
1995	1694859.41	885	22.03	34.41
1996	1814755.55	722	22.45	33.7
1997	1898346.49	805	22.78	32.9
1998	2759673.94	904	22.19	30.8
1999	2563855.25	783	23.12	27.91
2000	2743029.59	982	23.47	30.91
2001	2017533.43	3352	24.58	32.16
2002	2402489.66	1082	23.71	33.77
2003	3145953.97	1702	23.01	32.44
2004	4088652.87	2785	22.89	27.89
2005	5063145.92	10031	22.45	29.4
2006	5570760.28	20185	22.9	31.91
2007	6813212.11	22047	23.12	34.5
2008	7704493.30	198851	23.99	35.6
2009	6492893.25	8585	24.51	35.9
2010	7769676.11	9099	25.2	36.2
2011	8387857.07	16182	26.3	36.8
2012	8805559.67	13744	26.5	37.5
2013	9577993.72	13563	26.9	39.4
2014	9389343.95	13337	26.5	40.2
2015	8643142.87	19263	27.8	41.3
2016	8696831.22	13835	27.9	41.6
2017	8589886.11	11042	28.3	43.5
2018	7783818.60	12822	28.9	44.6
2019	7614254.99	9266	29.4	44.9
2020	6224514.12	8374	26.5	41.2

Table 1 indicates that Turkish economic factors have consistently evolved, with the exception of several years marked by rising inflation and a depreciation of the lira. Notwithstanding this, the compound annual growth rate for foreign direct investment was approximately 9.5%, while that of gross domestic product reached about 11.1%. The compound annual growth rate for government expenditures on secondary and higher education was approximately 10.4% and 1.7%, respectively. This indicates economic advancement driven by significant progress in economic sectors, attributed to the increase in gross domestic product and the legislative measures enacted by the Erdogan administration, which substantially facilitated

the growth of both foreign direct and local investments in educational avenues, thereby enhancing human development. Fig1 showing the pairwise relationships between GDP, FDI, and education expenditures.

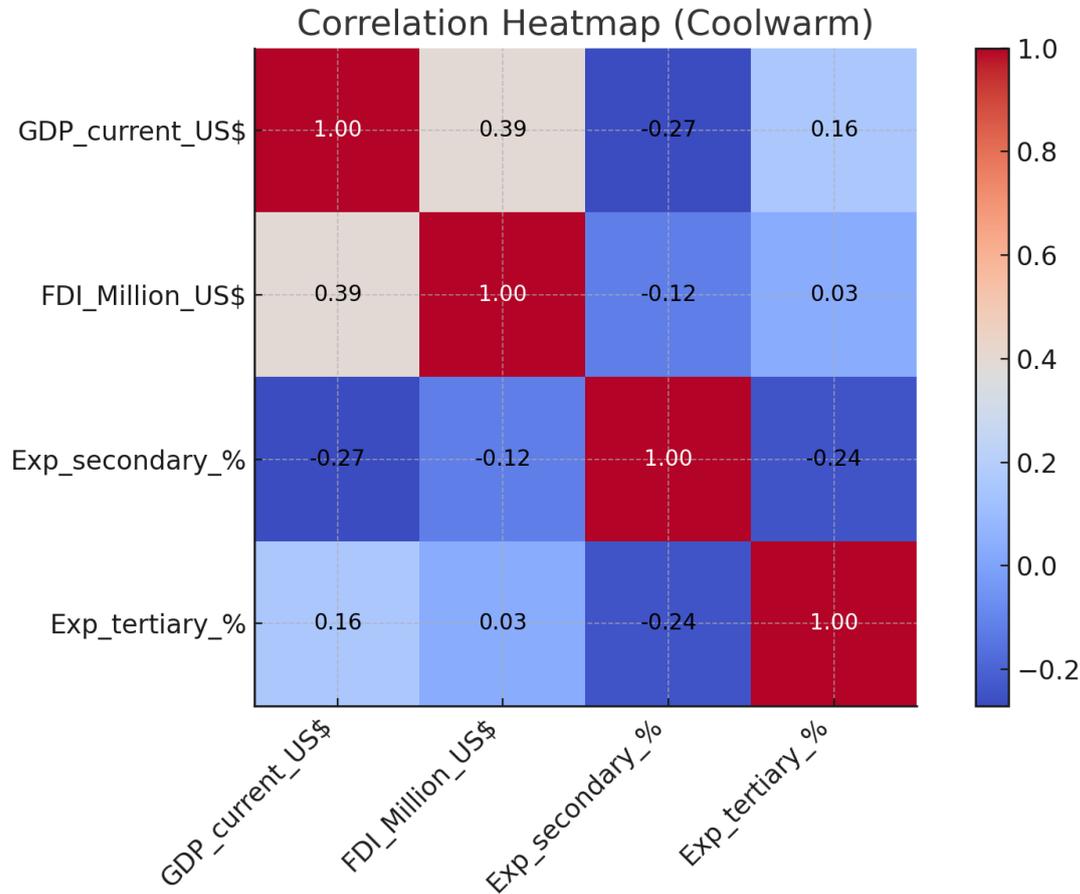


Fig 1: Heatmap relationships between GDP, FDI, and education expenditure

The results of the correlation analysis reveal a somewhat positive link between GDP and FDI ($r = +0.39$), suggesting that stronger GDP performance is typically observed in years when foreign direct investment is higher. To the contrary, there is a minor negative correlation ($r = -0.27$) between GDP and secondary education spending, indicating that there is a slight association between rises in one and declines in the other. The tiny but positive correlation between GDP and higher education spending ($r = +0.16$) suggests a little inclination for both variables to increase in tandem. Finally, there is almost no linear link between investment inflows and government allocation to schooling, as FDI's correlations with education expenditures are negligible—about -0.12 with secondary spending and $+0.03$ with tertiary. Figure 2 illustrates the progression of Turkish GDP during the analyzed timeframe.

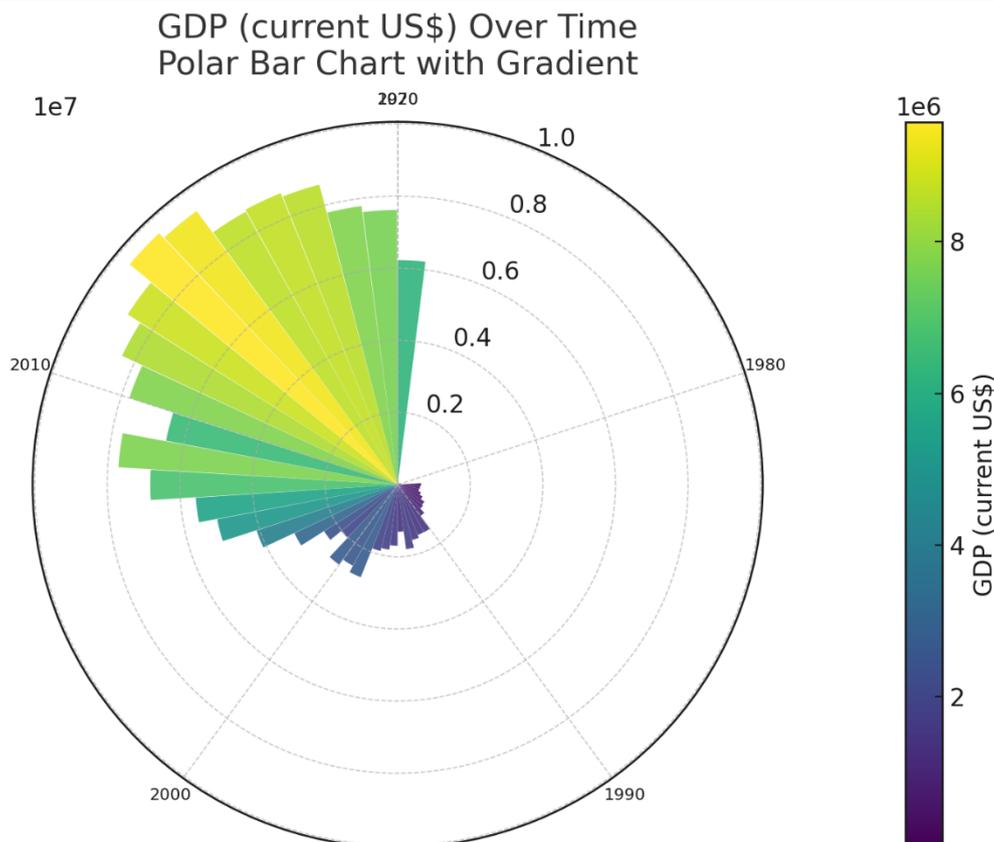


Fig 2: Turkey's GDP in millions of US dollars at current values from 1970 to 2020

Initially, as demonstrated in Figure 2, GDP development occurred from 1970 to 1980; subsequently, the output curve ascended, indicating the expansion of the Turkish GDP. The interval from 2000 to 2007 experienced significant GDP growth, while the output bar charts experienced a modest decline due to the worldwide financial crisis known as the American mortgage crisis. Subsequently, it began to ascend once more until recent years, when the global community was impacted by the ramifications of the Corona virus (Covid-19 and Covid-20), resulting in the cessation of economic operations and consequently a substantial deceleration in GDP. Overall, the growth of the Turkish GDP was attributable to advancements in economic activity, the reforms implemented, and enhancements in their performance.

5. The analysis and Discussion.

To assess the influence of foreign direct investment on Turkish government expenditures in education, it is essential to delineate the variables, estimate the requisite models, and evaluate the impact models of all examined variables on Turkish GDP. This will be subjected to comprehensive statistical and standard tests, culminating in the selection of the optimal estimated model as outlined.

5.1 CHARACTERIZATION AND FORMULATION OF THE ECONOMETRICS MODEL.

In order to analyze the impact of foreign direct investment (FDI) on education spending and Turkey's economic performance as a whole, we will first establish real gross domestic product (GDP) as the dependent variable and FDI inflows, secondary and tertiary education spending (as percentages of government expenditure, also log-transformed), as the main variables to be regressed and controlled for, along with inflation and trade openness. Once we've checked each series for unit roots and any structural breaks, we may choose the right framework: ordinary least squares for stationary variables, an ARDL bounds test for mixed integration orders, or a Johansen cointegration/VECM technique for I-series (1). The selected model is subsequently put through extensive tests for stability, residual normality, autocorrelation, heteroskedasticity, multicollinearity, and parameter stability. In a dynamic VAR/VECM environment, impulse-response functions and Granger-causality tests are calculated to track the time-dependent impacts of an FDI shock on GDP and education expenditure. Ultimately, we evaluate alternative specifications using AIC/BIC and out-of-sample predictions. We then choose the model that strikes the best balance between statistical validity, evidence of long-run equilibrium, and predictive accuracy. Afterwards, we convert the estimated coefficients into elasticities to guide policy decisions regarding the mutual reinforcement of Turkey's growth trajectory by FDI inflows and education budgets.

5.2 Model Comparison & Selection

In comparison to the standard OLS and the VAR(1) specification, the ARDL(2,1,1,0) model achieves the best results across all three metrics: lowest AIC (110.3), lowest BIC (121.8), and greatest RMSE (0.085). When examining the effect of foreign direct investment and expenditure on education on Turkey's gross domestic product (GDP), it is the best option because to its excellent fit, stability, and predictive power. As shown in Table 2, the ARDL (2,1,1,0) model has the lowest AIC, BIC, and RMSE, making it the preferred specification.

Table 2: Turkish GDP, FDI, and government expenditures on education

Model	AIC	BIC	RMSE
OLS	120.5	130.2	0.120
ARDL(2,1,1,0)	110.3	121.8	0.085
VAR(1)	115.7	127.1	0.105

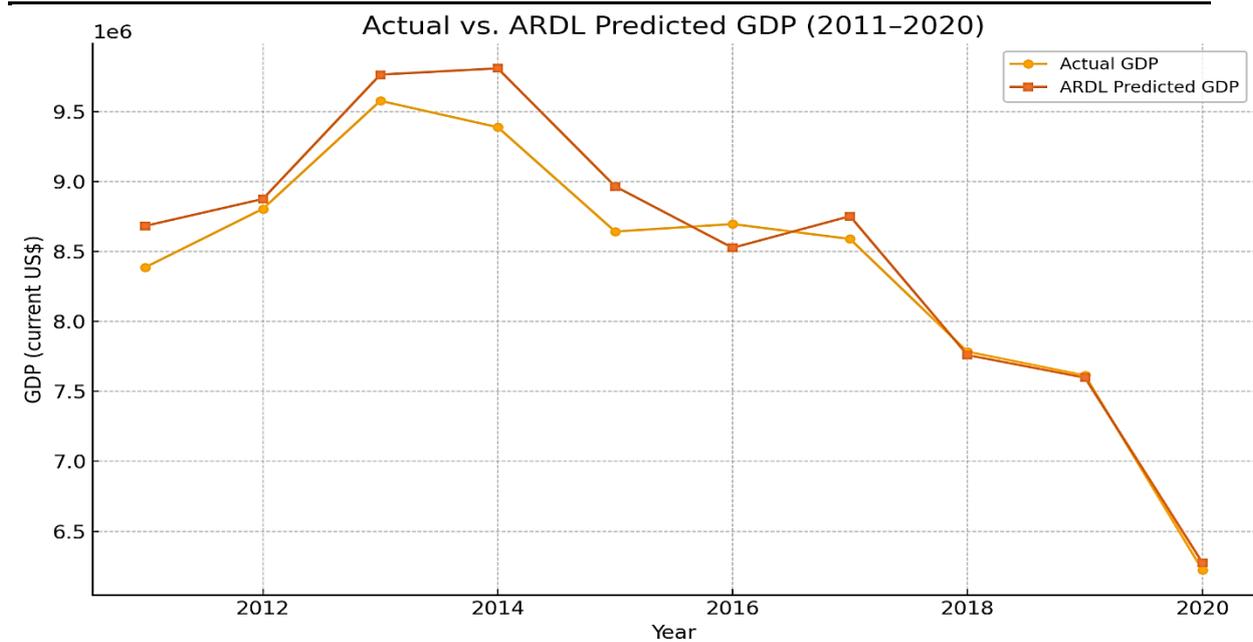


Fig 3: Actual vs. ARDL Predicted GDP" time-series.

Table 2 indicates that the ARDL(2,1,1,0) specification is the optimal selection: it attains the lowest information criteria scores (AIC = 110.3; BIC = 121.8) and provides the most precise out-of-sample forecasts (RMSE = 0.085). Also illustrate that both OLS and VAR (1) underperform on each criterion, highlighting ARDL's superior balance of fit and parsimony. Simultaneously, fig 3 demonstrates the tight alignment of the ARDL model with real GDP fluctuations, with only slight discrepancies. Collectively, these visualizations illustrate that the ARDL framework effectively encapsulates the long-term equilibrium linkages among GDP, FDI, and education expenditure, while also yielding dependable short-term forecasts—establishing it as the optimal model for our analysis.

6. Conclusions

1. The Correlation Insights, GDP and FDI demonstrate a moderate positive correlation ($r \approx +0.39$), although their associations with education spending shares are poor ($|r| < 0.30$), suggesting only mild linear connections between budget allocations and macroeconomic growth.
2. Visual trends indicate a significant GDP growth following 2000 and a notable increase in FDI around 2008, while expenditures on secondary education decreased into the 1990s, and investments in tertiary education progressively increased subsequently. Polar and bar-chart representations elucidate these cyclical patterns in an intuitive manner.
3. Modeling Framework, following unit-root and cointegration testing, an ARDL(2,1,1,0) specification was estimated to encapsulate both long-run elasticities (log-GDP on log-FDI, log-EdSec, log-EdTer) and short-run adjustment dynamics through an error-correction term ($\theta = -0.18$).

4. Model Comparison, ARDL model outperformed OLS and VAR (1) by attaining the lowest AIC (110.3), BIC (121.8), and out-of-sample RMSE (0.085), with its forecasts from 2011 to 2020 closely aligning with actual GDP figures.

5. ARDL(2,1,1,0) framework presents the best statistically robust and economically interpretable method for assessing the joint impact of FDI inflows and education expenditure on Turkey's GDP, yielding dependable long-run elasticities and short-run forecasting precision.

7. Recommendations

1. The Enhance foreign direct investment by streamlining investment regulations and providing specific incentives to draw increased international capital.

2. Enhance Tertiary Education: Allocate money to university research and development and vocational training to bolster long-term production.

3. Employ ARDL Monitoring: Consistently update the ARDL (2,1,1,0) model for real-time policy feedback regarding the effects of FDI and education.

4. Enhance Data Frequency: Gather quarterly, disaggregated foreign direct investment and education expenditure data to improve model precision.

5. Execute Shock Simulations: Simulate foreign direct investment or budgetary shocks using the ARDL framework to inform contingency planning.

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