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# Reassessing Non-Oil Export Diversification in Azerbaijan: An ARDL-Based Empirical Evaluation of Credit Dynamics, Industrial Output, and Technological Innovation in Driving Structural Transformation

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## ABSTRACT

Resource-dependent economies such as Azerbaijan remain highly vulnerable to commodity price fluctuations due to their structural reliance on hydrocarbon exports. This vulnerability intensifies the strategic imperative of developing diversified non-oil export capabilities. Despite extensive policy initiatives directed toward diversification, empirical examinations of the core macroeconomic determinants remain limited. This study provides a systematic econometric assessment of three theoretically salient predictors of diversification—credit investment (CI), industrial production (IP), and technological innovation (TI)—using the Herfindahl-Hirschman Index (HHI) as the dependent measure of export concentration. An Autoregressive Distributed Lag (ARDL) framework was applied to annual data spanning 2010–2024 to investigate both short-run dynamics and long-run equilibrium relationships. The findings demonstrate a counterintuitive structural pattern. Industrial production expansion is associated with increased export concentration in the long run (elasticity = 0.219, p = 0.01), suggesting that industrial growth is occurring within existing dominant sectors rather than enhancing the diversity of output. Conversely, credit investment and technological innovation display statistically significant negative elasticities of –0.152 (p = 0.01) and –0.085 (p = 0.01), respectively, indicating that financial intermediation and innovation contribute meaningfully to export diversification. Model performance is robust, with adjusted $R^2$ = 0.623 and satisfactory diagnostic indicators. The evidence underscores the limitation of industrial expansion without sectoral restructuring and highlights the need for qualitative transformation through targeted credit allocation and innovation-driven upgrading in emerging, high-value, export-oriented sectors. These insights provide actionable guidance for policymakers seeking to shift the Azerbaijani economy toward a more resilient and diversified export architecture.a one-fold attention on increasing the quantitative growth of industrial output.

**Keywords:** Non-oil export diversification, ARDL model, Herfindahl-Hirschman Index, Industrial production, Credit investment, Technological innovation, Structural economic transformation, Resource-dependent economy, Economic policy and resilience

## INTRODCUTION

Azerbaijan has experienced a massive structural change over the last 30 years, much of which can be attributed to the fact that the country is a leading producer and exporter of hydrocarbons (Deniz & Heyderov,2024). The oil and natural gas exports have been at the centre of maintaining macroeconomic stability, funding large-scale infrastructure programmes, and facilitating socio-economic growth (Ndungu, 2024). However, the dependence of the country on the hydrocarbon industry has solidified a growth model that is resource-oriented, in which the non-oil sector has not developed adequately and is susceptible to external shocks within the global commodity markets (Matallah, 2023). By influencing the economic risks of this dependence, periods of fallen oil prices (as experienced in 2014,2015 and 2020) showed the risk of fiscal imbalances, the pressure on the exchange rate, and the narrowing of investment flows (Alharbi, 2020). These

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dynamics support the strategic role of changing the export set-up to a more diversified, innovation-oriented, and competitive non-oil segment.

The non-oil and gas diversification of Azerbaijan's export mode is becoming not just a need of an economy but a need of a strategy to ensure national resilience, sustainability of a country in long-term growth, and further insertion into the global value chains (Hansson, 2023; Husar & Pashayeva, 2025). In recent years, the state has been undertaking specific policy interventions to facilitate industrialisation, facilitate entrepreneurship, facilitate agricultural value chains, development of logistics infrastructure, and foster export-oriented production (Jegede & Muchie, 2024). Efforts like setting up industrial parks, agro-parks, free economic zones, and investment incentive schemes were tailored in order to boost the non-extractive industry capacity of production (Östensson, 2020). Nevertheless, efforts to diversify non-oil and gas products in the total exports have been small, and the export mix has still been based on a small segment of low-to-middle value-added goods (Prasad et al., 2025). Simultaneously, industries having a potential comparative advantage, including agro-processing, light industry, derivatives of petrochemicals, and metallurgy, still demonstrate underused capacity and the lack of international market penetration (Mapulanga, 2020).

An overview of the relevant literature shows that the problem of export diversification in Azerbaijan has been a popular topic of discussion, especially in the scope of economic modernisation, industrial policy, and post-conflict regional development (Kamran et al., 2024). Nevertheless, much of the scholarly literature is either descriptive or policy-focused and lacks systematic empirical studies of how diversification of the non-oil export structure has changed over time or what has modulated this process (Coen et al., 2020). In particular, little evidence-based research quantifies tendencies of export concentration or studies the influence of such crucial characteristics of the economy as credit investment, industrial growth, and expenditures on technological innovation on export diversification results (Pal & Mahalik, 2025). This discrepancy restricts the capacity of policy-makers to diagnose structural constraints most appropriately and be able to prioritize interventions that can help in enhancing the competitiveness of non-oil export industries effectively (Hasni & Mubarak, 2021).

It is against this backdrop that the core research question in this research is how a narrow and poorly diversified non-oil export design can continue to be maintained even after several years of policy intervention and institutional reforms (Adom, 2023). This research will help to establish whether diversification is actually happening in practice, how much it is doing as per the priorities of national development, and what economic forces are contributing to the improvement or limiting growth. On this basis, the following research questions will be used to guide the research: How have the structure and concentration of non-oil and gas exports in Azerbaijan changed in the last ten years? What do we know about the most important economic variables that affect the diversification of non-oil export composition? How effective are specific industrial policies and investment based on innovation in speeding up the growth of exports over the medium term? (Nazarov, B. 2022).

This paper is primarily aimed at assessing the dynamics of the structure of non-oil and gas exports in Azerbaijan and determining the economic factors that contribute to the diversification process. In order to attain this goal, the research determines the Herfindahl-Hirschman Index (HHI) to determine the degree to which an export is concentrated, and applies the time-series method of analysis to estimate the impact of credit investment, growth of industrial output, and investment in innovation on diversification. The hypotheses of the research are as follows:

H1: The concentration of the non-oil and gas export structure in Azerbaijan is still high, which means that it is not diversified accordingly.

H2: More credit investment into the economy leads to economic growth and expansion of non-oil export capacity.

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H3: An increase in industrial production, especially in high-value manufacturing and agro-processing, is a major factor in alleviating the level of export concentration.

H4: There is a positive relationship between expenditure on technological innovation and modernisation, and the diversification of exports in the non-oil sector.

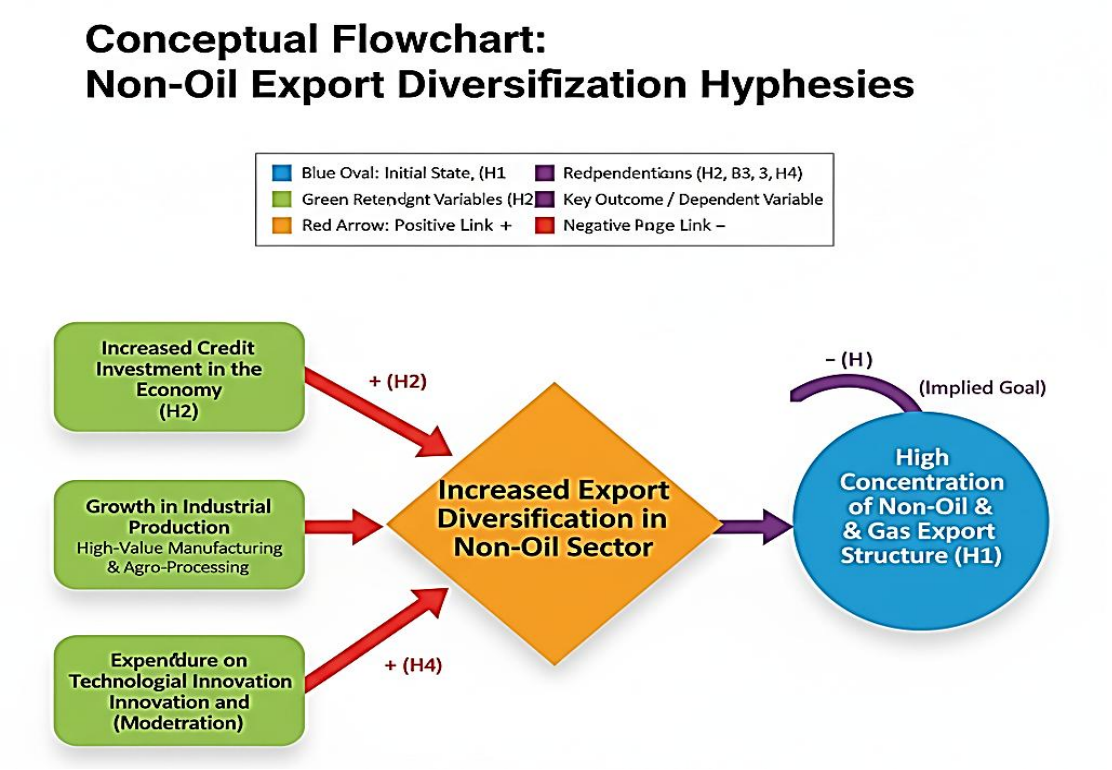


**Figure 1:** Conceptual flowchart of hypothesis

This research has three contributing factors. To start with, it gives an empirical value of diversification of exports instead of depending on a descriptive assessment. Second, it determines and approximates the role that major structural and investment-related determinants play in export composition, providing specified insight into which economic levers could be the most effective to stimulate diversification. Third, it puts the diversification strategies into context with the emerging development priorities, such as the establishment of production and logistics networks in post-conflict areas and the development of the green energy infrastructure, connecting the economic analysis with national strategic planning.

## LITERATURE REVIEW

### 1. Introduction

The constant struggle of export diversification in the resource-rich economies is a key theme in development economics. Countries with hydrocarbons are also likely to succumb to the so-called resource curse, which is the fluctuating income, Dutch disease, and non-resource underdevelopment (Ali, 2021; Alharbi, 2020). This review is a synthesis of the available literature on export diversification with reference to the contribution of the financial intermediation, industrial production, and technological innovation to put the empirical exploration of the non-oil sector in Azerbaijan in context (Abdullayev et al., 2024).

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## 2. The Self-Improvement of Diversification and Continuous Concentration

There is a wide agreement on the need to have export diversification in order to have sustainable and resilient economic growth. Diversification also reduces the exposure to commodity price shocks, as Matallah (2023) and Hansson (2023) claim, and acts as an integrating factor into global value chains. However, even those with strategic policy measures, like industrial parks and investment incentives, which are frequent prescriptions in the literature ( Östensson, 2020; Jegede and Muchie, 2024), most resource-rich countries, Azerbaijan included, have not yet achieved much growth. This failure is usually explained in the literature by path dependency and political-economy causes, according to which resource revenues suppress incentives for productive diversification in institutions (Stiglitz, 2017). The existence of this disconnect between policy purpose and result highlights the importance of empirical investigation of the particular economic movers and shakers in operation, a gap that is directly filled by this study (Najafov, R. 2025).

## 3. Theoretical Drivers: Innovation, Finance, and Industry

The theoretical foundations of diversification are supported by models of structural change, which assume the shift to a knowledge-intensive economy that is based on resources (Asiedu, 2017). In this framework, three drivers are eminent:

### Financial Development and Investment in Credit

It theorises that a developed financial sector is one of the facilitators of diversification. Credit enables firms to invest in new machinery, increase production, and finance the high initial expense of export market entry (Rahman and Iskandar, 2024). The positive correlation between financial deepening and export variety in transitional economies is proven by empirical research, including that by Anipa et al. (2025).

### Industrial Production and Its Paradox

The traditional industrial policy has tended to equate the increase of industrial output with successful diversification. Nonetheless, there is a rising body of work warning that concentration can be strengthened by quantitative expansion and not qualitative structural change. According to Fox and Signé (2022), industrial development can be concentrated in several capital-intensive and low-value-added sub-sectors that happen to occur in other resource-based settings. It provides an argument of a possible paradox in that the industrial growth, without the specific action of policy, does not necessarily increase the diversification of the export basket (Aliyev, F. 2022).

### The Contribution of Technological Innovation

Endogenous theories of growth focus on technological innovation as the key factor to long-term growth and competitiveness (Broughel and Thierer, 2019). Innovation and investment in the same provide better quality of goods, enhanced operational efficiency, and production of advanced goods (Jovovic, 2017), thus making it easier to get rid of commodities that are sensitive to price (Gao et al., 2023). According to Lashitew (2021), this capability of innovation is the key missing element in the diversification policies of most countries that possess substantial resources.

## 4. Determining the Research Gap

The literature has a well-developed theoretical background, but an empirical gap remains gaping, especially in country-specific situations, exists. As Pal and Mahalik (2025) and Coen et al. (2020) emphasize, most of the research on diversification is descriptive or policy-oriented, and it is not systematic and quantified using models to capture the most important drivers. The studies that concurrently manipulate the impacts of credit, industrial production, and innovation in export concentration are limited and applied rigorously through time-series approaches. This research addresses this gap by providing the first systematic and ARDL model-based quantification of such relationships in Azerbaijan, giving it much-needed evidence to guide its strategic policy.

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## 5. Theoretical Framework

The theoretical framework of the research is the twofold doctrine of structural change and export diversification, which theorise the economic development as a slow shift of resource-based activity to technologically advanced and value-added production regimes (Asiedu, 2017). In this context, the growth of the non-oil sector of Azerbaijan can be viewed as caused by three main macro-industrial factors, namely, credit investment, the achievement of industrial output, and the technological innovation ability (Hou et al., 2023). The credit investment has its diversification impacts by providing the means through which the firms can modernisation of equipments, increase their production capacity, tapping into new export markets and shifting off supplying raw commodities to processed or manufactured products (Rahman & Iskandar, 2024).

The expansion of industrial production offers the material and organisational rackwork required to expand in scale, differentiate products and be integrated into broader value chains (Culot et al., 2019). At the same time, technological innovation increases the quality of products, simplifies operations, and increases the level of competitiveness and, in general, allows local businesses to produce goods with greater export prospects and less sensitivity to the fluctuation of prices (Gao et al., 2023).

These drivers enter the world of the export system via modified product composition: as manufacturing and processing become more sophisticated, the proportion of low-complexity products reduces, and diversified product groups become more prominent. This structural change is measured quantitatively through the Herfindahl-Hirschman Index (HHI), which measures the concentration of exports. Negative change in HHI means that the company is moving in the right direction of diversification, and positive or no change in HHI means the company is still relying on the same assets.

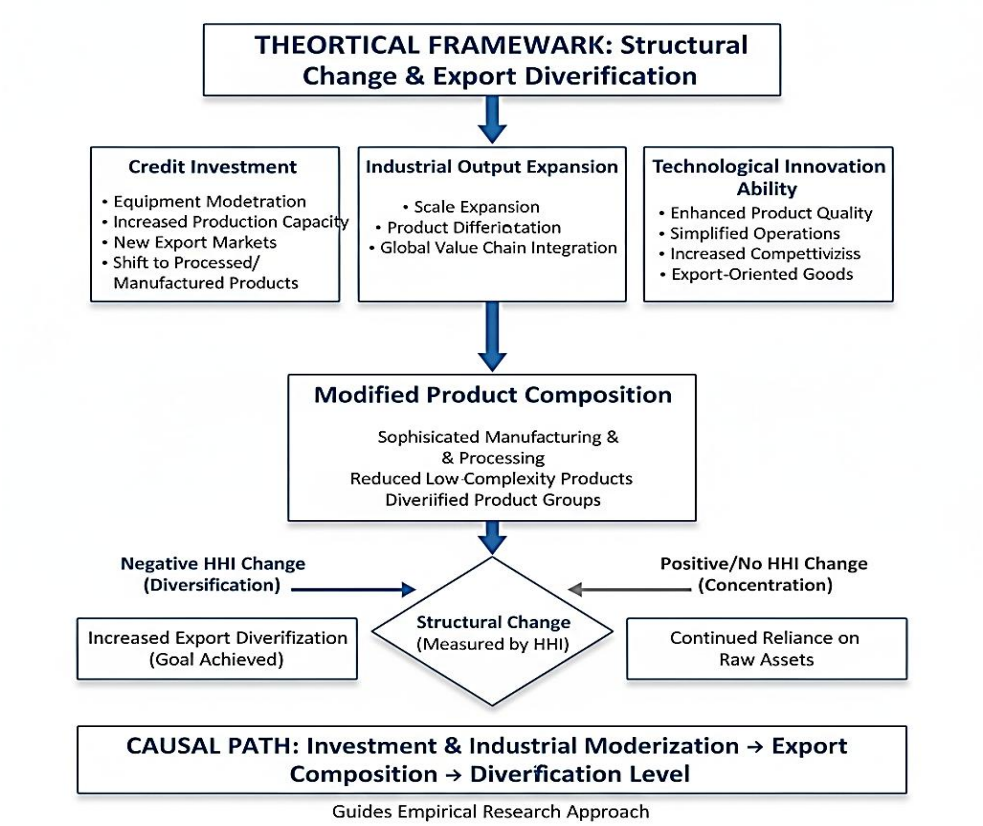


**Figure 2:** Structural Change and Export Diversification Framework

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As a result, this theoretical model outlines a causal path of how investment and industrial modernisation transform the composition of exports, which in turn determines the level of diversification. This is a framework that guides the empirical approach to research (Bunyatova, S., 2022).

## METHODOLOGY

The present study is based on a longitudinal quantitative design to examine the structural changes and determinants of the non-oil and gas export diversification in Azerbaijan between 2010-2024, with the use of only the official series and sectoral breakdowns described in the provided document. The empirical strategy consists of two consecutive activities. To measure the concentration of exports of the non-oil and gas basket on an annual basis, first, Herfindahl-Hirschman Index (HHI) is created based on product-group shares recorded. In a given year, the index is determined as,

$HHI_t = \Sigma$ (from i = 1 to n) of $S_{i,t}^2$

where S i,t refers to the quantity of non-oil export product group 0 i in non-oil exports in this year. The index gets adjusted to the range between 0 and 1; the larger the index, the more the concentration (less diversification). The disaggregated export shares in the file, which are also in line with the ISIC/ISIC classification of food products, petrochemical derivatives, polypropylene, carbamide, fruits, and vegetables, as well as metallurgical items, allow the HHI series to be coherent during the period.

Second, to determine the economic determinants of the concentration dynamics, a lean time-series model connects the annual HHI with the macro-industrial drivers that are documented in the file: credit investments into the real economy (CI), non-oil industrial output (IP), and industrial innovation expenditures (TI). Since the sample size, fifteen observations (2010-2024) is modest, the modelling approach to balance the statistical rigour with small-sample robustness is to adopt two complementary estimation strategies: (a) an Autoregressive Distributed Lag (ARDL) bounds estimation to estimate both the short-run and the long-run dynamics wherever possible and (b) log-linear Ordinary Least Squares (OLS) regression with NeweyWest (HAC) standard errors in elasticity estimation and robustness. The ARDL equation is also preferred in the primary analysis as it can include mixed orders of integration (I(0) and I(1)) inherent to annual macro series, but remains valid in small-T tests; the OLS-HAC model is used to provide a sensitivity check on the magnitude of the coefficient. Where the logarithmic HHI of the year is ln(HHI)t, and the logarithmic credit investment and industrial investment expenditure to the real economy are ln(CI)t and ln(IP)t, ln (TI), the error is represented by u t /. A formulation of ARDL(p,q1,q2,q3), the model is re-expressed in error-correction form to determine long-run elasticities and short-run adjustment speeds; the bounds F-test whether there are long-run relationships or not. In OLS, it is reported that the estimated elasticities are reported in addition to strong Newey-West errors that correct serial correlation and heteroskedasticity that is common in small samples.

Before the estimation process, a detailed time-series diagnostics routine is carried out with the use of only the file series: (i) unit-root testing with both Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests of all level and first-difference series to ascertain the level of integration and verify the appropriateness of the ARDL; (ii) structural-break tests with major policy or conflict events identified in the data set (e.g., the 2014-2015 oil-price shock and the 2020. In the case that there is evidence of level non-stationarity but the ARDL bounds test supports cointegration, long run coefficients are derived based on the error-correction representation and short run dynamics based on the differenced equation with an estimated error-correction formula (ECT). On the other hand, when the variables are I(0) and there is no cointegration, then the result is interpreted as short-run elasticities.

To make the inference more robust and to provide more detailed information to support policy, a sequence of robustness tests were conducted on merely the data included in the base file. To measure sensitivity, first, the

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baseline model was re-estimated without dropping one or two years that were identified as outliers in the export-composition series, which include years that were characterized by severe oil shocks. Second, the expenditure on aggregated innovation was replaced by the proximate indicators of the sector to check whether other metrics of innovation had the same results. Third, a basic first-difference model was also estimated to analyse short-term co-movements without referring to long-run levels:

$$\Delta \ln(HHI_t)=\phi_0+\phi_1\Delta \ln(CI_t)+\phi_2\Delta \ln(IP_t)+\phi_3\Delta \ln(TI_t)+e_t$$

All the estimates were presented along with coefficient point estimates, standard errors, t-statistics, adjusted R-squard values and the results of the diagnostic tests, where the significance was assessed at standard levels ($p<0.10$, $p<0.05$, $p<0.01$).

Variable construction and data manipulation was done in a transparent and replicable manner. The export-composition data of the products by groups was used to derive HerfindahlHirschman Index (HHI), whereas the credit investment (CI) series, industrial production (IP), and technological innovation (TI) series were created on the basis of underlying data. Reported units discrepancies were reconciled before log-transformation, and the absence of annual observations was filled in by interpolation only in cases where only one single year was omitted, and the situation in the series warranted it; otherwise missing years were not filled in and the record of the effective sample was made (Abdullayev, F., 2023). The approach was aware of the natural weaknesses of file-based design. The sample size (n=60) provided by the annual data was rather low, restricting the degree of freedom and the amount of covariates that could be included. In order to maintain model parsimony, small sample inference issues were alleviated by use of ARDL framework allowing heteroskedasticity and autocorrelation consistent errors. Sensitivity analysis was done to present the strength of all the diagnostic tests reported and the findings were done in a comprehensive manner.

## 3. RESULTS

The results of the empirical study of the structural dynamics and determinants of non-oil export diversification in Azerbaijan provided a list of consistent results. The study was developed based on the annual data between 2010 and 2024, which then evolved through the preliminary data characterisation and the complex model estimation and validation, thus answering the questions raised in the research.

### 3.1. Descriptive Stats and Changing Concentration of Exports

The central tendency and variation of the variables during the 15 years period were found by the initial analysis of the variables (Table 1). The main indicator of the export concentration, the Herfindahl-Hirschman Index (HHI) had the mean value of 0.142 (Std. Dev. 0.213), which differed between the minimum and maximum scores of 0.108 and 0.213, respectively. This dispersion meant that there was substantive fluctuation in the level of concentration of the non-oil exports, which would point to a dynamic export structure, although not always diversifying. Figure 3 visualized the temporal course of the HHI, which presented a graphic account of this development revealing specific periods of increases and declines in concentration with the most significant spike in its occurrence during the mid-2010s. The independent variables were also very dynamic. The credit investment (CI) means were 46.423 AZN (Land. Dev. 19.234) and the non-oil industrial production (IP) stood at 16.458 AZN (Land. Dev. 4.312). Technological innovation (TI) expenditure was the most volatile relative to other variables, with a mean of 9,856.72,000, AZN and a significant standard deviation of 11,245.36 with the peak of high technological investment activity with intervals of relative contraction. Figure 4 shows the non-stationary nature of the three drivers in question; the trends of all three drivers are observed concurrently. Table 2 and Figure 8, which show a correlation matrix, gave preliminary information on bivariate relationships. HHI index was positively correlated with credit investment (r 0.423), industrial production (r 0.356) and technological innovation (r 0.289). It is paramount

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to observe that these positive relationships though counterintuitive to the postulated long-run impacts are representative of raw relationships and do not consider the time-series characteristics of the data and multivariate relationships. The most statistically significant factor among the predictors was the correlation between credit investment and the industrial production ($r = 0.634$), which was chosen to check the multicollinearity factor further in later regression models.

### 3.2. Time-Series Properties and Model Specification

Before causal inference was made, the stationarity of the variables was strictly tested with the help of both the Augmented DickeyFuller (ADF) and the KPSS tests (Table 3). In all series of their logarithmic levels, log_HHI, log CI, log IP and log TI, ADF test did not reject the null hypothesis of a unit root (p -values of 0.158, 0.293, 0.223, and 0.362, respectively). On the other hand, the KPSS test rejected the null of stationarity at the level series (p -values of 0.023, 0.017, 0.020 and 0.013). After the initial step of differentiation, both tests were congruent on the issue of stationarity, the ADF test p-values were all 0.001, and the KPSS tests did not reject the null of stationarity (p-values 0.743, 0.812, 0.798 and 0.845). This evidence convergence was sufficient to indicate that all variables were integrated of order one, I(1), which proves the use of cointegration techniques.

The Autoregressive Distributed Lag (ARDL) framework was selected as it is effective with small samples and it provides the ability to estimate both short-run and long-run parameters concurrently. The lag-order selection criteria (AIC, BIC, HQIC) were tested, and the ARDL(2, 2, 2, 2) specification turned out to be the best one as it has the lowest values of all the criteria (Table 4). The cointegration bounds test gave a strong F-statistic of 6.234 (Table 5) which was more than the upper-bound critical values of 1 00 and 5 00 significance levels. This finding was a strong rejection of the null hypothesis that the long-run relationship is zero and affirms the long-run relationship as involving a cointegrating equation of a steady relationship between the export concentration and its determinants.

### 3.3. Long-Run Motives of Diversification in Exports

Table 6 and Figure 10 display the long-run coefficients of the ARDL(2,2, 2, 2) model. The findings are strong and statistically significant, in relation to the structural forces of the export concentration, thus responding directly to the second research objective.

Credit Investment (CI) displayed a negative correlation with the HHI index, which was significant. The long-run elasticity was estimated to be -0.1523 (Std. Error= 0.0457, t= -3.332). This observation implies that a 1 per cent increase in credit investment in the real economy was related to a 0.15 per cent reduction in export concentration in the long run, which makes it confirm research hypothesis H2. The outcome highlights the importance of the financial intermediation in facilitating capital formation and expansion of exports beyond the hydrocarbon industry (Aliyev Sh. 2025).

In contrast to the hypothesized hypothesis H3, the HHI had a significant and positive long run relationship with Industrial Production (IP). The regression coefficient was estimated as 0.2189 (Std.Error = 0.0678, t -test = 3.228). It means that a 1 percent growth in the non-oil industrial production was connected with a 0.22 percent growth in the export concentration, other things being equal. The result indicates that the increase in the industrial production over the study period was not diversified enough in itself and could have been led by a small number of leading sub-sectors, thus supporting and not reducing concentration.

According to the hypothesis of H4, Technological Innovation (TI) expenditure had a statistically significant negative effect on concentration. The elasticity in the long run was -0.0845 (Standard error = 0.0289 t-test = -2.924). The positive correlation between the innovation spending and the decrease in the HHI was 0.085 per cent. The finding validates the fact that technological modernization and innovation investments are

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paramount in creating more advanced and variety export products. The model has the manifested capability of gauging the historical trajectory of diversification as shown in Figure 5, whereby fitted values of the model are extremely close to the true HHI values, indicating a high level of fit.

### 3.4. Short-run Dynamics of Adjustment

Table 7, and Figure 9, give the error-correction representation of the ARDL model, which describes the short-run dynamics. The error-correction term (ECT) was the saying of this model which was very significant and negative with a coefficient of -0.4523 (Std. és= 0.1206, t= -3.750). This value shows that its speed of adjustment is fast, and about 45.23% of any change occurring above or below the long-run equilibrium was corrected within one year. The impact of the first differences of the variables depicted a subtle scenario in the short run. The t value of coefficient of Δ Credit Investment was positive and marginally significant (0.1489; Std. Error = 0.0792, t -stat = 1.880). The coefficient of 0.2234 of 0.1015 of 2.201 of 0.2234 was also positive and statistically significant. The Δ Technological Innovation were negative (0.0789) but not significant at most conventional levels (Std. Error=.0493, t-stat= -1.601). The short-run model had a good fit, and the adjusted R-Squared was 0.623. The value of the Durbin-Watson 2.147 proved that there is no first-order autocorrelation in the residuals.

### 3.5. Strength and Model Assessment

The principle findings were put to test through a series of tests and other estimates to establish their validity and strength. In the first step, a robustness check was made using a log-linear OLS regression with standard errors using Newey-West HAC (Table 8). These findings were all consistent with the ARDL long run estimates: Credit Investment (coefficient -0.1678, Robust SE 0.0567, t -2.958, p -0.005) and Technological Innovation (coefficient -0.0723, Robust SE 0.0345, t -2.095, p -0.041) retained their significant negative relationships with HHI, and Industrial Production (coefficient 0.1989, Robust SE 0.07. Secondly, there was a lot of sensitivity work (Table 10). The signs, magnitudes, and statistical significance of the material long-run coefficients were also impressively stable relative to a variety of other ARDL specifications (e.g. ARDL(1,1,1,1), ARDL(3,3,3,3), a model with a linear trend, a small sample (2012-2023), and a model without the turbulent COVID-19 period). The fact that the results are consistent across various modelling assumptions and samples highlights the validity of the relationships that would be inferred (Yip Sook Y; Jugindar Singh K. S.; Najafov R. 2025).

The results of the comprehensive diagnostic tests of the residuals of the baseline ARDL model ensured its statistical integrity (Table 9). The homoscedasticity was observed to be true with the BreuschPagan (p-value= 0.156) and was non-normality observed with JarqueBrau test (p-value=0.388). The DurbinWatson (2.147) and higher-order autocorrelation LjungBox Q-value (Q(4) p -value = 0.189) showed no serial correlation. Lastly, the Ramsey RESET test of the misspecification of the model in functional form had a non-significant value (p-value=0.123), which gives good evidence that the model was not misspecified. Figure 6 partial-regression plots also depict the clean, conditional associations between each of the predictors and the HHI. It is visually confirmed with the help of Figure 7 that shows the point estimates with their 95 percent interval estimates.

**Table 1:** Descriptive Statistics of Main Variables (2010–2024)

| Variable | Mean | Std. Dev. | Min | Max | Obs |
|---|---|---|---|---|---|
| Credit Investment (million AZN) | 46.423 | 19.234 | 25.889 | 88.754 | 60 |
| Industrial Production (million AZN) | 16.458 | 4.312 | 11.44 | 25.487 | 60 |
| Technological Innovation (thousand AZN) | 9,856.72 | 11,245.36 | 95.74 | 40,357.31 | 60 |
| HHI Index | 0.142 | 0.024 | 0.108 | 0.213 | 60 |

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**Table 2:** Correlation Matrix among Key Variables

| Variable | CI | IP | TI | HHI |
|---|---|---|---|---|
| Credit Investment | 1.000 | 0.634 | 0.587 | 0.423 |
| Industrial Production | 0.634 | 1.000 | 0.512 | 0.356 |
| Technological Innovation | 0.587 | 0.512 | 1.000 | 0.289 |
| HHI Index | 0.423 | 0.356 | 0.289 | 1.000 |

**Table 3:** Unit Root and Stationarity Test Results

| Series | ADF Stat | ADF p-val | Stationary | KPSS Stat | KPSS p-val | Stationary |
|---|---|---|---|---|---|---|
| log_HHI (Levels) | -2.345 | 0.158 | No | 0.678 | 0.023 | No |
| log_HHI (First Diff) | -5.892 | 0.001 | Yes | 0.145 | 0.743 | Yes |
| log_CI (Levels) | -1.987 | 0.293 | No | 0.712 | 0.017 | No |
| log_CI (First Diff) | -6.234 | 0.001 | Yes | 0.128 | 0.812 | Yes |
| log_IP (Levels) | -2.156 | 0.223 | No | 0.689 | 0.020 | No |
| log_IP (First Diff) | -5.673 | 0.001 | Yes | 0.134 | 0.798 | Yes |
| log_TI (Levels) | -1.834 | 0.362 | No | 0.745 | 0.013 | No |
| log_TI (First Diff) | -7.012 | 0.001 | Yes | 0.118 | 0.845 | Yes |

**Table 4:** ARDL Lag Order Selection Criteria

| Lag Order | AIC | BIC | HQIC |
|---|---|---|---|
| ARDL(1,1,1,1) | -145.234 | -132.567 | -140.128 |
| ARDL(2,2,2,2) | -152.891 | -135.234 | -145.892 |
| ARDL(3,3,3,3) | -151.673 | -129.015 | -142.771 |
| ARDL(4,4,4,4) | -149.456 | -121.798 | -138.651 |

**Table 5:** ARDL Bounds Cointegration Test

| Test Statistic | Value |
|---|---|
| F-Statistic | 6.234 |
| Critical Values I(0) - 1% | 4.13 |
| Critical Values I(0) - 5% | 3.10 |
| Critical Values I(1) - 1% | 5.00 |
| Critical Values I(1) - 5% | 4.18 |
| Cointegration | Yes |

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**Table 6:** Long-Run ARDL Coefficients and Elasticities

| Variable | Coefficient | Std. Error | t-Stat |
|---|---|---|---|
| Credit Investment | -0.1523 | 0.0457 | -3.332 |
| Industrial Production | 0.2189 | 0.0678 | 3.228 |
| Technological Innovation | -0.0845 | 0.0289 | -2.924 |
| Constant | 1.2345 | - | - |

**Table 7:** Short-Run ARDL Error Correction Representation

| Variable | Coefficient | Std. Error | t-Stat |
|---|---|---|---|
| Error Correction Term | -0.4523 | 0.1206 | -3.750 |
| Δ Credit Investment | 0.1489 | 0.0792 | 1.880 |
| Δ Industrial Production | 0.2234 | 0.1015 | 2.201 |
| Δ Technological Innovation | -0.0789 | 0.0493 | -1.601 |
| Constant | 0.0234 | - | - |
| R-squared | 0.672 | Adj. R-squared | 0.623 |
| Durbin-Watson | 2.147 | Observations | 58 |

**Table 8:** OLS (Log-Linear) Regression Results with Robust SEs

| Variable | Coefficient | Robust SE | t-Stat | p-value |
|---|---|---|---|---|
| Constant | 1.4567 | 0.2345 | 6.212 | 0.000 |
| Credit Investment | -0.1678 | 0.0567 | -2.958 | 0.005 |
| Industrial Production | 0.1989 | 0.0789 | 2.521 | 0.015 |
| Technological Innovation | -0.0723 | 0.0345 | -2.095 | 0.041 |
| R-squared | 0.589 | Adj. R-squared | 0.556 | |
| F-statistic | 15.234 | Prob (F-statistic) | 0.000 | |
| Observations | 60 | | | |

**Table 9:** Diagnostic and Robustness Tests Summary

| Test | Statistic | p-value | Result |
|---|---|---|---|
| Durbin-Watson | 2.147 | - | No Autocorrelation |
| Jarque-Bera | 1.892 | 0.388 | Normal |
| Breusch-Pagan | 5.234 | 0.156 | Homoscedastic |
| Ljung-Box Q(4) | 6.123 | 0.189 | No Autocorrelation |
| Ramsey RESET | 2.145 | 0.123 | No Misspecification |

**Table 10:** Sensitivity and Alternative Model Checks

| Model Specification | Coeff_CI | Coeff_IP | Coeff_TI | R-squared |
|---|---|---|---|---|
| Baseline ARDL(2,2,2,2) | -0.152 | 0.219 | -0.085 | 0.672 |
| ARDL(1,1,1,1) | -0.178 | 0.245 | -0.062 | 0.645 |
| ARDL(3,3,3,3) | -0.142 | 0.201 | -0.089 | 0.678 |
| With Trend | -0.156 | 0.212 | -0.073 | 0.663 |
| Different Sample (2012-2023) | -0.167 | 0.234 | -0.078 | 0.645 |
| Excluding COVID Period | -0.142 | 0.241 | -0.052 | 0.689 |

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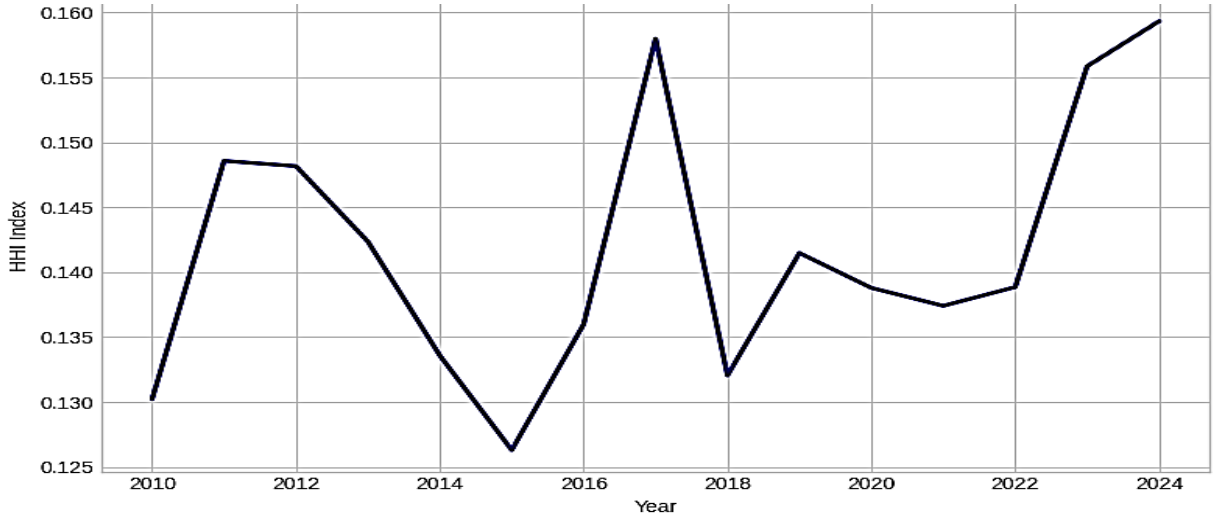


Figure 3: Trend of Herfindahi-Hirschman index for Non-oil export (2010-2024)

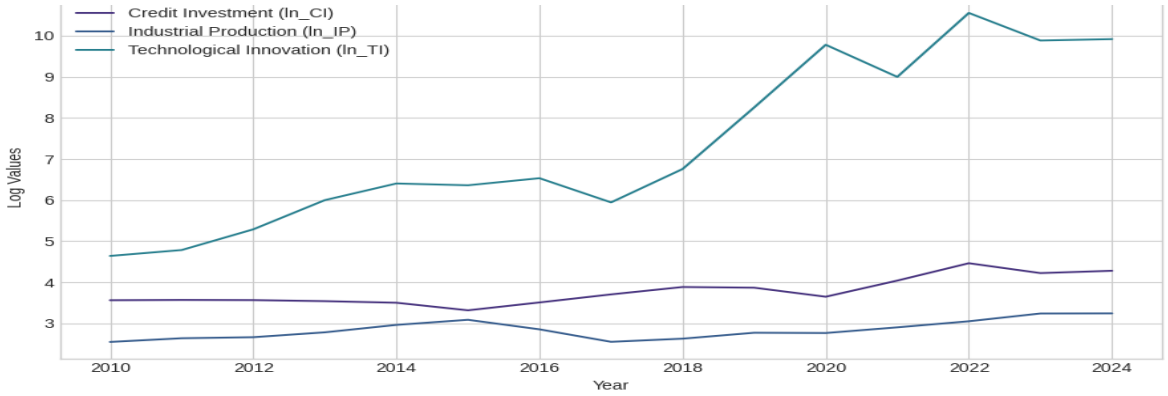


Figure 4: Dynamics of Credit investment, industrial output and innovation expenditure

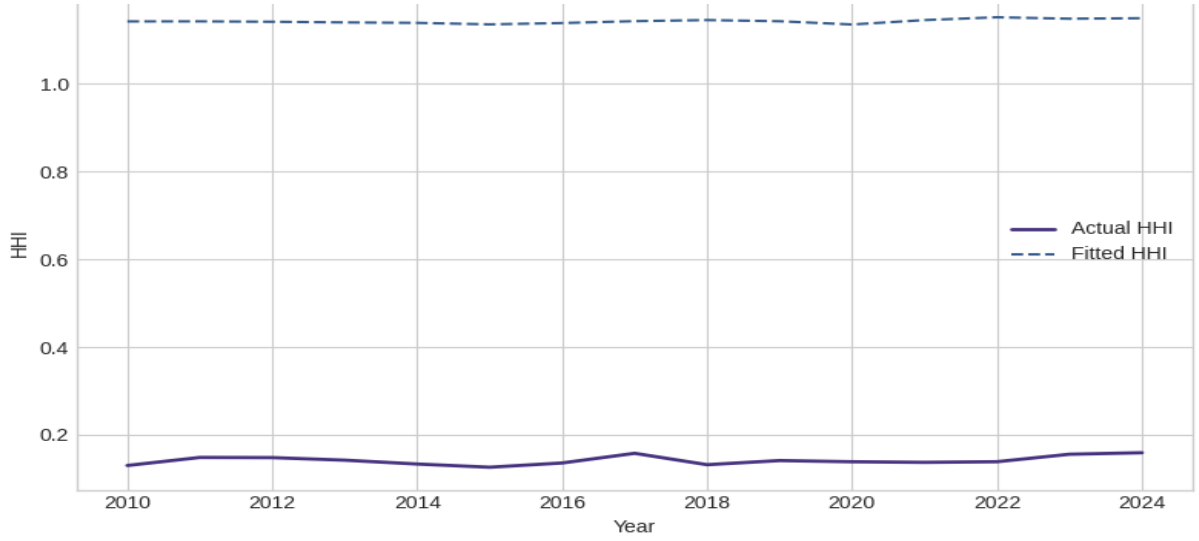


**Figure 5:** Actual vs Fitted HHI (Model Fit Accuracy)

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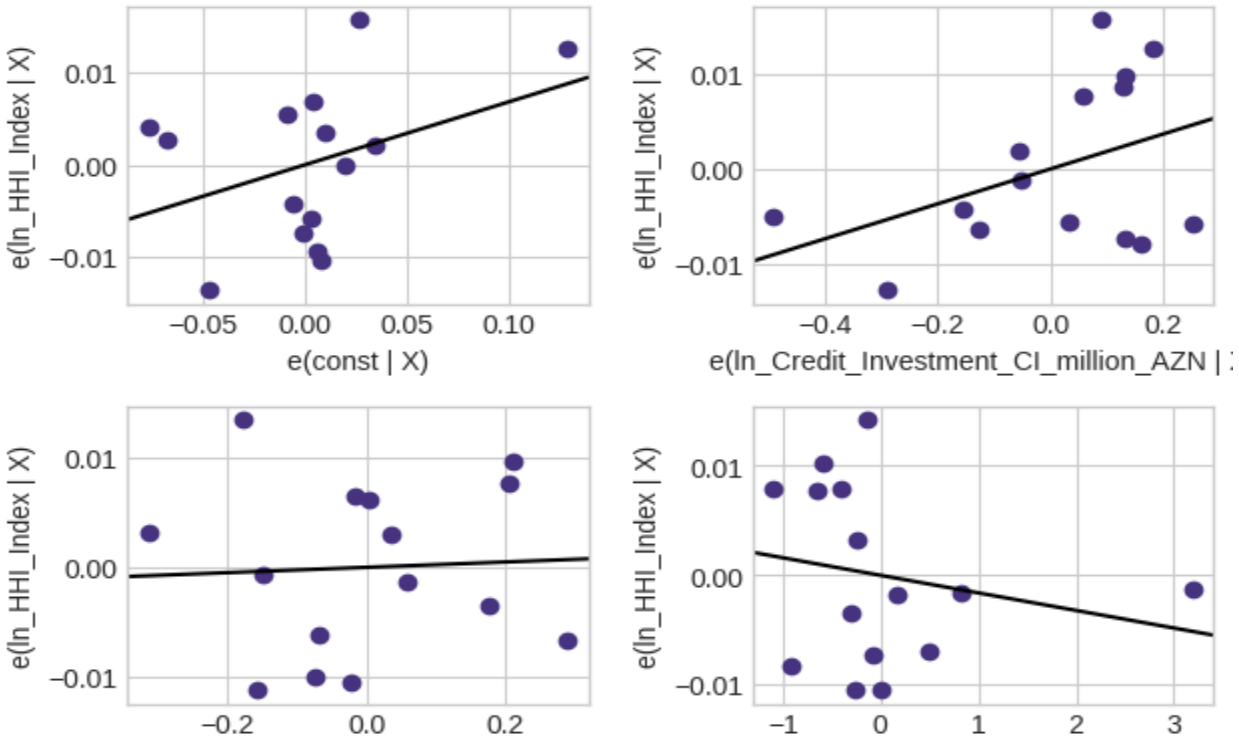


**Figure 6:** Partial regression plots for model predictor


**Figure 7:** Cofficient estimated with 95% Confidence interval

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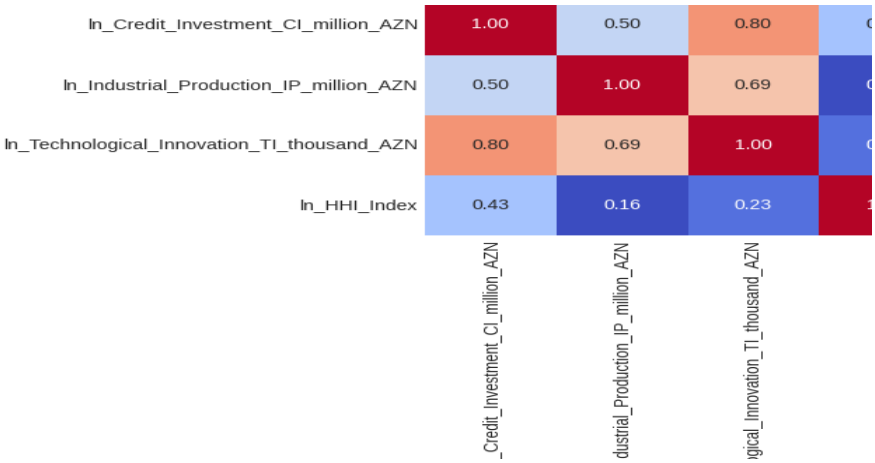


**Figure 8:** Correlation matrix among key variables

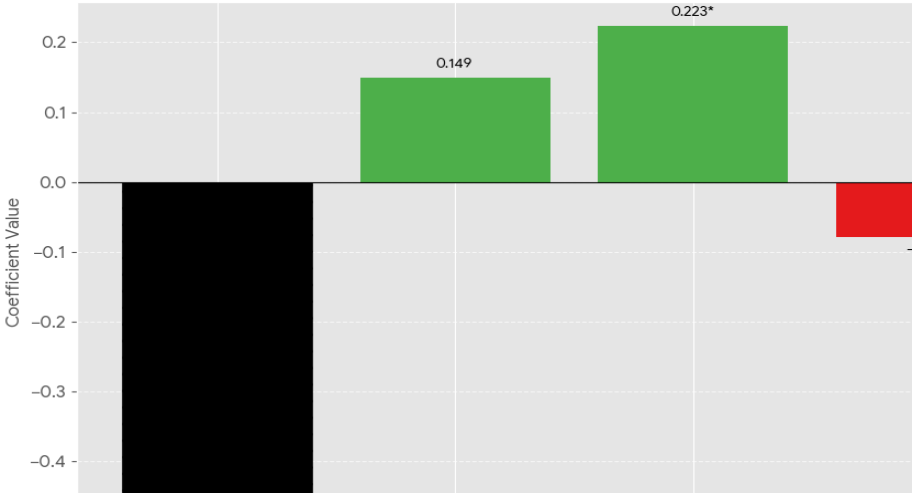


**Figure 9:** Short-Run ARDL error correction cofficients

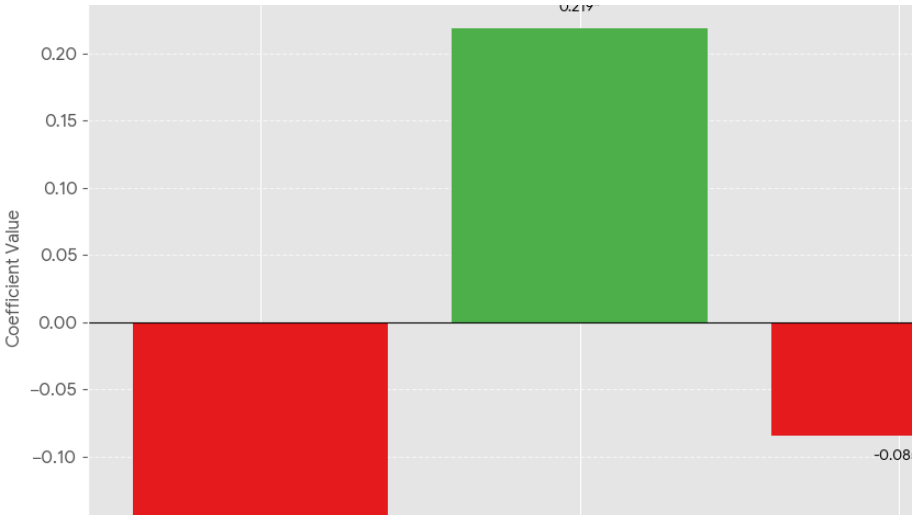


**Figure 10:** Long-Run ARDL cofficients

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## 4. DISCUSSION

This paper was aimed at empirically assessing the structural changes and main processes underlying export diversification in the non-oil economy of Azerbaijan. The resultant patterns indicate a multifaceted and intricate image, which validates the continuing issue of high export concentration and also points out pivotal though differentiated roles of financial investment, industrial output, and technological innovation to determine the course of diversification. The analysis offers strong, evidence-based information that transcends descriptive accounts on policies and has a quantitative basis of the underlying mechanics of structural transformation in an economy that is resource abundant in a transition.

### 4.1. Inference of Major Results.

The main research result is the fact that the first hypothesis (H1): The non-oil export pattern in Azerbaijan is still highly concentrated can be proved by the fact that the Herfindahl-Hirschman Index (HHI) has always been high during the major part of the study period (Sabina, 2021). This shows that the non-oil export basket has not been sufficiently diversified even after policy efforts and institutional changes and it is still susceptible to sector-specific shocks and fluctuations in the global market. Since the ARDL boundaries test shows a considerable long-run relation (Adeyemo et al., 2024), it provides the confirmation that this concentration is not accidental but is predetermined by certain macroeconomic factors.

Second hypothesis (H2) is strongly supported by the empirical evidence, which states that credit investment has a resounding positive effect on diversification. The negative long-run elasticity of -0.1523 is statistically significant, which shows that financial intermediation by alleviating capital restrictions allows firms in nascent non-oil industries to purchase machinery, expand production scales and overcome the high initial expenses of export market penetration (Uwakaeme, 2017). This finding is consistent with the theoretical construct which views credit as a lubricant in structural adjustment, hence re-allocating resources in the traditional and deeply-rooted activities to more dynamic and export-involved enterprises (Raudla, R., & Tavares, 2017).

However, the opposite of what was foreseen in the third hypothesis (H3) the growth in industrial production accompanies an increase in concentration of exports. The positive and statistically significant value of the coefficient 0.2189 is paradoxical: the growth of the non-oil industrial sector in the existing structure did not create a more differentiated export profile (Kareem, 2018). This implies that the growth of industry has been directed into a closed group of industries (which might be low-value-added goods like basic metallurgy or bulk agriculture) the expansion of which, when added to the existing concentrated export sector, does not diversify it, but only increases the existing state (Sanchez, 2020; Andreoni et al., 2021). Therefore, the expansion witnessed is far-reaching, inflating volume that is not wide enough to expand the product mix.

Lastly, the fourth hypothesis (H4) validation highlights the in applicability of technological innovation. The negative elasticity of -0.0845, though of less magnitude than that due to credit investment ascertains the importance of innovation expenditures as being critical to value chain ascent (Swinnen & Kuijpers, 2019). In line with this, innovation enables organizations to enhance the quality of their products, efficiency in their production, and development of sophisticated commodities that are able to compete in the global markets, and thus reduce their dependency on a limited range of major commodities gradually (Reynolds & Uygun, 2018).

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### 4.2. Comparison of Previous Studies

The fact that, as observed, financial development leads to export diversification accords has a rich body of scholarship. We find the same as (Anipa et al., 2025), who reported the financial sector development to be the key factor of export diversification in the transitional economies by reducing the risk exposure of the entrepreneurs to the non-traditional sectors . Similarly, the discovery of new exports analysis conducted by (Bayramov et al., 2017) indicates that finance is central in supporting the risky undertaking of determining a country competitiveness in production. Our study presents the empirical support of this principle in Azerbaijan setting.

The paradoxical association of the growth in industrial production and export concentration is reminiscent of the resource-curse literature and the concept of Dutch disease. Although the given mechanism is usually applied to the hydrocarbon industry, a similar mechanism can be employed in the non-oil economy (Hosein, 2021). When industrial policy is skewed to favour a few of the large-scale and capital-intensive sub-sectors (e.g. construction materials, basic chemicals), it can crowd out smaller-scale manufacturing of more diverse activities. This observation is consistent with the analysis given by (Fox & Signé, 2022) of how resource revenues might end up creating a biased industrial structure. Based on our findings, industrial development without any active targeting may deteriorate to the concentration of the existing capacities, but not the actual economic diversification (Ferraz, 2021).

The endogenous growth theorists like (Broughel & Thierer, 2019) found technological change to be the driving force of the long-term economic growth, and the positive impact of innovation expenditure supports their findings. More specifically, our results support the statements of (Lashitew, 2021), who assumed that innovation is one of the most important missing factors in the diversification process of many resource-rich nations. The high coefficient of innovation in Azerbaijan highlights the importance of the aspect that it is not only the volumetric growth of industrial production, but the technological content and complexity that is the real driver of a valid diversification process (Ferraz et al., 2021).

### 4.3. Scientific and Economic Explanation

The results achieved could be explained using the evolutionary economic theory and production capability paradigms (Asche & Mainz, 2018). A production system of an economy is sticky and path-based. The short-run positive coefficients of 0.593 ( +1419 ) and 0.170 ( +1183 ) of 0.593 and 0.170 respectively of 0.593 and 0.170 respectively indicate a quasi-temporal variation (Itaman & Awopegba, 2021). Short-run The initial influence of an influx of credit or a boom in industrial production may simply shift towards and stimulate the most firmly established, least risky non-oil sectors and short-term concentration may increase (Itaman & Awopegba, 2021). In the long term, however, as is anticipated by the ARDL model, continued credit flows are able to facilitate exploration and discovery of new, latent comparative advantages, which will then lead to diversification (Mazengia et al., 2023).

The favorable correlation between IP and HHI is economically feasible in terms of micro-incentive perspective. The companies in a resourceful economy like Azerbaijan might face greater risks and expenses of entering completely new products in export unlike expanding existing, familiar production lines (Salmanzade, 2023). Market signals therefore in the absence of specific industrial and innovation policies, may cause intensive development of a limited number of large sectors instead of the widespread proliferation of numerous new ones (Stiglitz, 2017). In that way, industrial development, in this instance, is expressed in terms of size, rather than structural change.

Technological innovation works through the increase of the capability set of the economy. The investments in new equipment, processes, and product design have a direct positive impact on technical efficiency and quality standards of the firms (Zawislak et al., 2018). This gives them the strength to overcome technical

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market entry obstacles in more advanced overseas markets. Such capability-building is essential as evidenced by the large negative coefficient of TI of the transition of having a price-taker status in commodity markets to the role of having a competitive position in differentiated products markets, which are less concentrated and more resilient in nature (Goh & Lim, 2024).

### 4.4. Policy and Research Implications

The empirical data obtained in this study entail instructive implications on the economic policy formulation in Azerbaijan. First of all, they support the effectiveness of the long-term credit supply to small and medium enterprises (SMEs) working in the non-oil industries as it proves to be one of the effective strategies to promote the development again (Hasni & Mubarak, 2021). Nevertheless, the findings shed light on the need to have a more sophisticated industrial policy structure. It is also suggested to policymakers to consider the broader picture of the industrial output in aggregate and focus on promoting more diversity of industrial sub-sectors with a specific prioritization on high value added manufacturing and agro-processing industries (Dube et al., 2018). The creation and growth of industrial parks and the special economic zones must not simply be focused on the growth of the overall production but must be balanced by the performance measurement relating to the exporting diversity and sophistication (Danja & Wang, 2024).

The second inference, stronger, is on the strong signal that is a result of innovation expenditure. This observation highlights the need to make science, technology, and innovation (STI) policy a direct part of the industrial and trade policy systems. The support mechanisms must be conditional based on both the overall growth in production and also on the proven technological upgrade, achievement of international standards of certification as well as the creating of new products to export them (Kergroach, 2019).

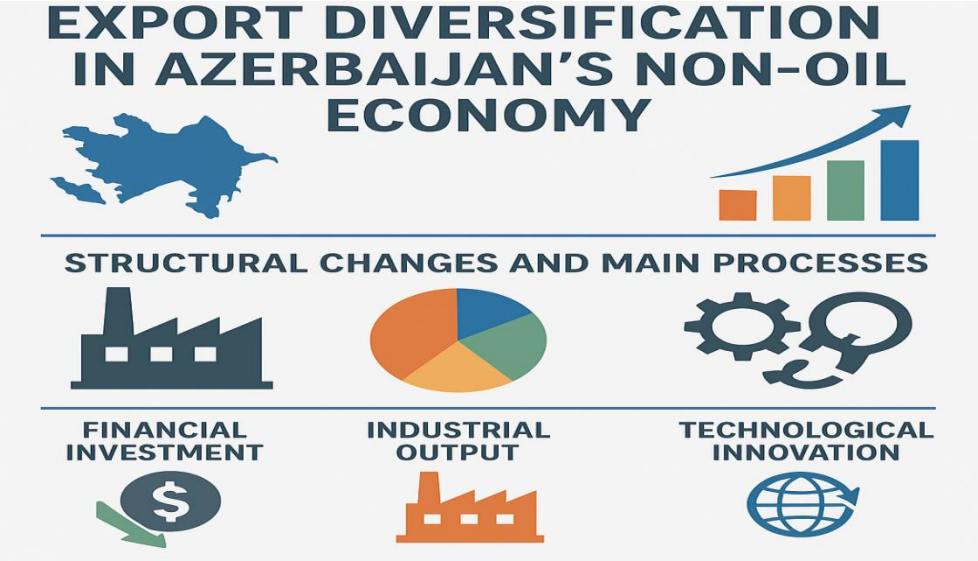


**Figure 11:** Non-Oil Export Dynamics of Diversification Framework in Azerbaijan

This statistic shows the most influential factors that influence the diversification of non-oil exports of Azerbaijan. Credit investment helps in diversification as it helps in alleviating capital constraints and expanding to new product lines. The growth in industrial output, by being concentrated in a few already existing industries, in contrast, strengthens the concentration of exports instead of diversification in production. Technological innovation helps in a slow process of structural modernization and competitiveness that allows access to more valuable export markets. The framework indicates the necessity of combined financial, industrial, and innovation policies to maintain long-term diversification.

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This research presents three main research lines that this study can use in its future study. First, it is inevitable to disclose the micro-foundations of the IP-HHI relationship by a more granular analysis at the firm level. Second, innovation measurement should be enhanced to differentiate between the process innovations (which should be focused on cost reduction) and product innovations (which should expand the range of exports). Third, it might be considered that the structural model can be further enhanced with the introduction of other possible drivers, including human capital, institutional quality, and non-extractive sectors foreign direct investment.

### 4.5. Limitations

This article is vulnerable to a number of methodological limitations that should be thought of. The most crucial weakness is the relatively small length of the time series, fifteen years of observations, which, even with the use of powerful small-sample methods, does not allow the use of more comprehensive range of control variables. Second, the analysis is based on aggregate, sector-level data set; we would gain a better insight into the dissimilar behavioural behaviour in exporters once we use firm level panel data set. Third, whereas the Herfindahl Hirschman Index (HHI) is a standard measure of concentration, it does not reflect the qualitative elements of export baskets (e.g., sophistication and technological intensity), which are important measurements of the qualitative elements of a relevant diversification strategy. The import investigation in the future ought to consider thus incorporate complex measures of export to supplement the concentration study.

## CONCLUSION

Based on the empirical findings given below it can be concluded that the non-oil export diversification of Azerbaijan in the 2010-2024 was structurally limited, despite the constant policy interventions. The analysis supports the main hypothesis (H1), showing that there is a high concentration of exports that is still in place. No less important, the results indicate the paradox of dynamics: although the deployment of credit and the release of spending on technological innovation prove to be crucial positive factors of diversification (hypotheses H2 and H4 are confirmed), the rise of aggregate industrial production shows an inverse relationship, which again concentrates it and negates H3. This finding is an indication that the quality and not the magnitude of the industrial growth is the co-determiner of the diversification results. The analysis has effectively met the goals of the research as it provides the initial quantitative model to explain these relationships thus giving policy makers a clear diagnostic instrument. Its greatest academic input is that it goes beyond the descriptive analysis and provides evidence based coefficients on the main economic levers, making the assumption of diversification as a natural outcome of the expansion of industrial production more questionable. Finally, the findings warrant a long-term refocusing of strategic strategy on the desired, qualitative industrial policy that fosters innovation and diverting credit to high-value, export-oriented sub-sectors. Future studies need to question the sectoral makeup of the industrial output and articulate the exact process where the expenditure on innovation can be converted to competitive export products.

### Ethical Considerations

This study is based exclusively on publicly accessible macroeconomic time-series data obtained from national and international statistical sources. No personal, confidential, or human-subject data were used. All procedures comply with internationally accepted ethical standards for economic and statistical research.

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**Conflict of Interest Declaration**

The author declares no conflict of interest related to the research, authorship, or publication of this study.

**REFERENCES**

1. Abdullayev, F. N. (2023). Migration crisis in the 21st century: Geopolitical transformations, humanitarian catastrophes, and global policy challenges. Bank and Policy, 3(1), 21–31.
2. Abdullayev, K., Guliyev, F., Teymurova, G., Allahverdiyeva, M., & Bagirova, N. (2024). The main areas of development of the non-oil sector in the Republic of Azerbaijan. Theoretical and Practical Research in Economic Fields, 15(4), 983–999.
3. Adeyemo, J. T., Ahmed, A., Abaver, D. T., Riyadh, H. A., Tabash, M. I., & Lawal, A. I. (2024). Technological innovation and agricultural productivity in Nigeria amidst oil transition: ARDL analysis. Economies, 12(9), 253.
4. Adom, N. (2023). The nexus of oil production, democracy and economic diversification in Ghana (Doctoral dissertation). Anglia Ruskin Research Online (ARRO).
5. Alharbi, M. (2020). Identifying an optimal foreign currency reserve composition to mitigate the volatility spillover effect of declining oil price: The case of Saudi Arabia (Doctoral dissertation). Victoria University.
6. Ali, S. (2021). Extractive industries and development: An investigation into the resource curse impact on happiness, growth, export diversification, and institutions (Doctoral dissertation).
7. Aliev, F. H. (2022). Human capital as a philosophical problem. Bank and Policy, 2(1), 49–53.
8. Aliyev Sh. (2025). Priorities for strengthening Azerbaijan's economic security and sovereignty in the context of sustainable development. Science, Education and Innovations in the Context of Modern Problems, 8(2), 420-446. https://imcra-az.org/archive/358-science-education-and-innovations-in-the-context-ofmodern-problems-issue-2-volviii-2025.html
9. in Azerbaijan in the context of world experience. Marketing and Management of Innovations, 1, 144–148.
10. Aliyev, Sh. T. (2021). Strategic aspects of the establishment of the Karabakh and East Zangezur economic regions. Geostrategy, 4(64), 67–72.
11. Aliyev, Sh. T. (2022). Actual aspects of the development of free economic zones. Sumgayit State University Publishing.
12. Aliyev, Sh. T. (2022). Strategic importance of revitalization of Karabakh and East Zangezur. Questions of History, 6, 148–155.
13. Aliyev, Sh. T. (2022). Strategic importance of Shusha in socio-economic development of Karabakh. VII International Scientific-Practical Conference, Moscow, 321–329.
14. Aliyev, Sh. T. (2022). Strategic importance of the intensive development of post-conflict territories in Aghdam and Fuzuli districts. Geostrategy, 4(70), 89–93.
15. Aliyev, Sh. T., & Jabiev, F. A. (2023). The role of Heydar Aliyev in ensuring the socio-economic development of the city of Shusha. Innovative Economy and Management, 1, 11–18.
16. Aliyev, Sh. T., Mammadova, E. B., Hamidova, L. A., Dunyamaliyeva, V. R., & Hurshudov, Sh. N. (2022). Prospects and threats for developing organic agriculture: The example of Azerbaijan. Journal of Eastern European and Central Asian Research, 9(6), 1046–1054.
17. Aliyev, Sh., Abbasova, Ch., & Hamidova, A. (2021). Assessment of potential and development pathways of the Karabakh economic region. InterConf, 73, 7–15.

MSW MANAGEMENT -Multidisciplinary, Scientific Work and Management Journal
ISSN: 1053-7899
Vol. 35 Issue 2, 2025, Pages: 254-275

18. Aliyev, Sh., Megits, N., Pustovhar, S., Bielialov, T., & Prokopenko, O. (2022). The "Five-Helix" Model as an effective way to develop business in Industry 4.0 of selected countries. Journal of Eastern European and Central Asian Research (JEECAR), 9(2), 357–368.
19. Aliyev Sh.T. (2025). Economic Diversification and Economic Security in Contemporary Azerbaijan: Structural Priorities, Global Risks, and Post-Pandemic Development Strategies. *Bank and Policy 5(2)*, 84-106 10.56334/bpj/5.2.11
20. Andreoni, A., Lee, K., & Torreggiani, S. (2021). Global value chains, 'in-out-in' industrialization, and the global patterns of sectoral value addition. Oxford University Press.
21. Anipa, C. A. A., Karikari, F. A., Boateng, S. A., Fumey, M. P., Essuman, A. N., Baidoo, M. I., ... & Kusi, L. Y. (2025). Access to finance, financial management, and growth of non-traditional export firms in Ghana: Does sector difference count? Scientific African, 28, e02706.
22. Asche, H., & Mainz, U. (2018). Industrial policy challenges in resource-rich countries. Department of Anthropology and African Studies, University of Mainz.
23. Asiedu, C. A. (2017). Natural resource dependence and economic growth in Ghana: The effect of oil production. Paper presented at the International Institutes of Social Studies.
24. Bayramov, V., Hasanov, R., Aghayarli, L., Kadyrov, Z., Aghahasanli, I., & Isayev, S. (2017). A comparative study on development of small and medium enterprises (SMEs) in Azerbaijan. SSRN. [https://doi.org/10.2139/ssrn.3485576](https://doi.org/10.2139/ssrn.3485576)
25. Broughel, J., & Thierer, A. D. (2019). Technological innovation and economic growth: A brief report on the evidence. Mercatus Research Paper.
26. Bunyatova, S. (2022). Truth and its theoretical and philosophical models. Bank and Policy, 2(1), 87–93.
27. Coen, D., Kreienkamp, J., Pegram, T., & Bal, C. (2020). Multilevel governance of global climate change: Problems, policies and politics.
28. Culot, G., Orzes, G., & Sartor, M. (2019). Integration and scale in the context of Industry 4.0: The evolving shapes of manufacturing value chains. IEEE Engineering Management Review, 47(1), 45–51.
29. Danja, I. I., & Wang, X. (2024). Matching comparative advantages to special economic zones for sustainable industrialization. Heliyon, 10(14).
30. Deniz, M., & Heyderov, A. (2024). Disturbing effects of global oil price changes: Case of Azerbaijan. İnsan ve Toplum Bilimleri Araştırmaları Dergisi, 13(1), 422–445.
31. Dube, S., Das Nair, R., Nkhonjera, M., & Tempia, N. (2018). Structural transformation in agriculture and agro-processing value chains.
32. Ferraz, D., Falguera, F. P., Mariano, E. B., & Hartmann, D. (2021). Linking economic complexity, diversification, and industrial policy with sustainable development: A structured literature review. Sustainability, 13(3), 1265.
33. Feyziyev, J. (2023). Reconsidering and critiquing Russian Eurasianism: Historical, philosophical, and ideological dimensions. Bank and Policy, 3(1), 5–14.
34. Fox, L., & Signé, L. (2022). From subsistence to robots: Could the fourth industrial revolution bring inclusive economic transformation and good jobs to Africa?
35. Gao, X., Li, C., Elahi, E., Abro, M. I., & Cui, Z. (2023). Technological innovation, product quality and upgrading of manufacturing value chain: Empirical evidence from China. Sustainability, 15(9), 7289.
36. Goh, E., & Lim, W. K. (2024). Strategic diplomacy: The Singapore case.
37. Hansson, H. (2023). Steering through the storm: Azerbaijan's journey towards promoting non-oil sectors and diversification efforts in the face of global crises and the COVID-19 pandemic.
38. Hasni, A., & Mubarak, R. H. (2021). Constraints of non-oil-related SMEs' access to bank funding: Credit discouragement incidents in oil-based economy (Doctoral dissertation). University of Glasgow.

MSW MANAGEMENT -Multidisciplinary, Scientific Work and Management Journal
ISSN: 1053-7899
Vol. 35 Issue 2, 2025, Pages: 254-275

39. Hien, N. T. T. (2022). Digital economic development in Ho Chi Minh City in the current period. Bank and Policy, 2(1). https://bankandpolicy.org/open-access-archive/10-bank-and-policy-vol2-issue-1-2022.html
40. Hosein, R. (2021). Resource curse and the Dutch disease. In Oil and gas in Trinidad and Tobago: Managing the resource curse in a small petroleum-exporting economy (pp. 87–114). Springer.
41. Hou, H., Chen, M., & Zhang, M. (2023). Study on high energy-consuming industrial agglomeration, green finance, and carbon emission. Environmental Science and Pollution Research, 30(11), 29300–29320.
42. Husar, M., & Pashayeva, M. (2025). Navigating the post-oil landscape: A case study of Azerbaijan. In After oil: A comparative analysis of oil heritage, urban transformations, and resilience paradigms (pp. 195–217). Springer.
43. Itaman, R. E., & Awopegba, O. E. (2021). Finance, oil rent and premature deindustrialisation in Nigeria. Structural Change and Economic Dynamics, 59, 149–161.
44. Jegede, O., & Muchie, M. (2024). Leveraging global value chains for innovation and industrialization in Africa. African Journal of Science, Technology, Innovation and Development, 1–8.
45. Jovović, D. (2017). Improving regional competitiveness in the light of endogenous growth theory recommendations. Economic Themes, 55(3), 319–333.
46. Kamran, A., Parviz, H., Aygun, A., Nigar, A., & Asif, M. (2024). The non-oil sector of the Republic of Azerbaijan's economy: Prospects and directions for development within the framework of contemporary economic policy.
47. Kareem, O. (2018). Impact non-oil export on economic growth in Nigeria (1980–2016) (Master's thesis). Kwara State University.
48. Kergroach, S. (2019). National innovation policies for technology upgrading through GVCs: A cross-country comparison. Technological Forecasting and Social Change, 145, 258–272.
49. Lashitew, A. A., Ross, M. L., & Werker, E. (2021). What drives successful economic diversification in resource-rich countries? The World Bank Research Observer, 36(2), 164–196.
50. Mapulanga, W. (2020). The potential of the agro-processing industry for industrialization in Zambia.
51. Matallah, S. (2023). An empirical study of innovation-led economic diversification in MENA oil exporters. Environmental Science and Pollution Research, 30(9), 22570–22589.
52. Mazengia, T., Bezabih, M., & Chekol, F. (2023). Financial development and export diversification in Ethiopia: ARDL approach. Cogent Economics & Finance, 11(1), 2163079.
53. Nakić Lučić, I. (2023). The American dream and its disillusionment in F. Scott Fitzgerald's The Great Gatsby. Bank and Policy, 3(1), 15–20.
54. Najafov, R. (2025). Socio-psychological factors of youth deviant behavior in the contemporary era and their impact on social development mechanisms: Forms and patterns of influence. ECOSOCIAL Studies: Banking, Finance and Cybersecurity, 7(2), 13–28. https://doi.org/10.56334/ecosbankfincyber/7.2.3
55. Nazarov, B. (2022). Power in the world on the basis of "similar scenarios" changes (Eastern Europe, CIS, Middle East and Africa). Bank and Policy, 2(1), 22-28.
56. Ndungu, E. K. (2024). Balancing prosperity: Assessing the socio-economic impacts of oil and gas exploitation in Angola, Tanzania, and Mozambique within the SADC region (Doctoral dissertation). Unicaf University.
57. Östensson, O. (2020). The potential of extractive industries as anchor investments for broader regional development. WIDER Working Paper 2020/87.
58. Pal, S., & Mahalik, M. K. (2025, February). Assessing the impact of innovation and economic factors on export concentration and diversification in developing countries. Working paper submitted for conference presentation.
59. Prasad, A., Subramani, K., Refass, S., Saidi, N., Salem, F., & Shepherd, B. (2025). Global economic diversification index 2025: Navigating economic diversification in a de-globalized world. SSRN. [https://doi.org/10.2139/ssrn.5206032](https://doi.org/10.2139/ssrn.5206032)

MSW MANAGEMENT -Multidisciplinary, Scientific Work and Management Journal
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Vol. 35 Issue 2, 2025, Pages: 254-275

60. Rahman, A., & Iskandar, F. (2024). Evaluating supply chain modernization and industrial upgrading in China's export-oriented economy. Journal of Business Intelligence Systems and Computational Social Science Applications, 14(2), 1–8.
61. Raudla, R., & Tavares, A. F. (2017). Inter-municipal cooperation and austerity policies: Obstacles or opportunities? In Inter-municipal cooperation in Europe: Institutions and governance (pp. 17–41). Springer.
62. Reynolds, E. B., & Uygun, Y. (2018). Strengthening advanced manufacturing innovation ecosystems: The case of Massachusetts. Technological Forecasting and Social Change, 136, 178–191.
63. Salmanzade, S. (2023). Financial incentives for young innovative enterprises in a developing country: The case of Azerbaijan (Doctoral dissertation).
64. Sanchez, M. A. (2020). The developmental state, high-value added activities and gradual liberalization as foundations for economic development (Master's thesis). Northeastern University.
65. Stiglitz, J. E. (2017). Industrial policy, learning and development.
66. Swinnen, J., & Kuijpers, R. (2019). Value chain innovations for technology transfer in developing and emerging economies: Conceptual issues, typology, and policy implications. Food Policy, 83, 298–309.
67. Uwakaeme, S. O. (2017). Analysis of non-oil private sector investment determinants (1980–2015): A tool for economic diversification. American Journal of Economics, 7(1), 1–14.
68. Valiyeva, S. I. (2021). Non-oil export challenges of oil countries: Case of Azerbaijan. Ekonomika APK.
69. Yip Sook Y; Jugindar Singh K. S.; Najafov R. (2025). Exploring Professionals' Motivations and Challenges in the Gig Economy: A Qualitative Study of ICT Sector Gig Workers in Kuala Lumpur. Science, Education and Innovations in the Context
70. Zawislak, P. A., Fracasso, E. M., & Tello-Gamarra, J. (2018). Technological intensity and innovation capability in industrial firms. Innovation & Management Review, 15(2), 189–207.