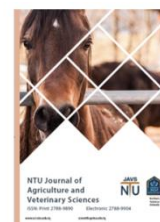






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# Economic Analysis of Poultry Production and Marketing in Nineveh Governorate 2024: Producer and Consumer Perspectives

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## ABSTRACT

The poultry sector in Iraq, like many other agricultural activities, faces increasing challenges due to the economic, political, and security conditions the country has experienced over the past decades. This has negatively impacted its ability to grow, compete, and achieve self-sufficiency. The poultry sector is considered a key sector that contributes significantly to enhancing national food security, providing job opportunities, and reducing dependence on foreign imports. This study is based on the urgent need to understand the reality of poultry production and marketing in Nineveh Governorate, and to analyze production efficiency and the factors influencing marketing. This study aims to identify the problems and obstacles facing the sector, as well as explore the opportunities and potential available for its development and enhancement of its role in the local economy. The research followed a two-way method (theoretical and field). The theoretical aspect comprised the review of literature and previous research as well as scrutiny of theories associated with poultry farming, while economic, production and market concepts that pertain to the PBF were examined. Field work The field aspect of the study was conducted with interviewing primary data collection from two main subsystems of the poultry sector value chains in Nineveh governorate (Iraq), namely, comprehensive list of small and medium farmers (43-farm sample) and consumers selected randomly from different locations in the governorate (100 consumer-respondent sample). The questionnaires tools were made respects the scientific bases and processed and analyze by statistics superiors programs. The standard relationship between local production and some macroeconomic variables during the study period was analyzed using Autoregressive Distributed Lag (ARDL) model, with cointegration tests and error correction analysis carried out by EViews software. The research findings revealed that the poultry sector in Nineveh suffers a number of problems related to its production, including high cost of feed and veterinary drugs, lack technical and advisory services, using old technical equipment, insufficient government support for this sector and absence of infrastructure such as electricity, water and refrigerators. The marketing strategies were also found to be structurally weak, the lack of institutionalized marketing and the dominance of intermediaries and fair reference prices were visible. All of these factors have led to significant price fluctuations between producers and consumers, in addition to limited access to major markets both within and outside the governorate. The study reached a set of key conclusions, most notably that improving the status of the poultry sector in Nineveh requires a comprehensive intervention that includes developing infrastructure, providing production inputs at subsidized or competitive prices, and strengthening veterinary and agricultural guidance. Modern breeding and nutrition technologies must also be adopted, in addition to establishing modern slaughterhouses that meet health and technical standards. The study also recommended the adoption of clear marketing strategies based on actual market data, regulating markets by setting fair reference prices, and strengthening marketing contracts between farmers and distributors, while activating the government's role in oversight and support.



## Introduction

The poultry sector is one of the primary agricultural sectors in Iraq, playing a vital role in enhancing food security and providing a primary source of animal protein at affordable prices compared to red meat. This sector plays a direct role in driving the local economy through employing huge number of people from production to consumption. It also plays a role in promoting the related markets of feed, veterinary medicine, production and sale materials. Local poultry production competes with some force against imported products, which are often sold at low prices as a result of foreign subsidies, making local ones less competitive in the market.

This study seeks to highlight the truth in this sector from two primary standpoints. The former are related to production and include farm efficiency, technology intensity, production expenditure, and product quality. The second discusses marketing, using distribution channels, consumer behavior and the particular problems of selling for producers and distributors. The study also hopes to prompt initiatives to develop the industry, build on an appropriate marketing approach that could add value by increasing domestic productions and ultimately sustaining the economy.

Therefore, the purpose of this study is to review and analyze previous literature and studies using marketing strategies sector and production efficiency poultry as a research track which focused on adopted theoretical models, applied experiences in local, national and international levels. These studies include Ali (1) who studied the reality and components of the production of chickens industry and its effects, Khalaf (2), which is considering analyze the food gap in poultry products in Iraq, Abu Zaid (3) And other researches. The findings of the reference review on a set of previous investigations, point out several points in common of that refer to the present study as well as various point of differences able to distinguish them under topic focus, method and spatial and temporal scale.

**Objectives:** The research provides a good contribution in scientific and applicable for Support of the PMPD sector in Nineveh . This is achieved by systematically reviewing and analyzing the most prominent field challenges, as well as proposing realistic, applicable solutions based on available data and indicators.

### **Study problem:**

Despite the natural and human potential that Nineveh Governorate possesses for poultry production, this sector faces many problems, most notably weak production efficiency, lack of effective marketing strategies, and low competitiveness against imported products or

those produced in other governorates. Therefore, the problem of the study is represented in the question: To what extent is the poultry production sector efficient in Nineveh Governorate, and what are the marketing strategies that can contribute to improving its performance and increasing its effectiveness?

### **Study objectives :**

This study aims to:

1. Diagnose the reality of poultry production and marketing in Nineveh Governorate.
2. Evaluate the efficiency of production performance of local farms.
3. Identify the most prominent marketing challenges facing producers and distributors.
4. Analyze the internal and external environment affecting the sector using SWOT and PESTLE tools.

#### **First: Poultry industry**

The poultry industry is one of the most rapidly expanding animal sectors worldwide and, consequently, production and consumption have sharply increased over the past decades due to different economic and social reasons. Some of these factors are related to diet changes towards consumption of white meat, rapid population increase, better purchasing power and technological improvement in animal feeding, production as well as breeding. (4).

Worldwide poultry meat output was around 133 million tons in 2020, while in 1961 it stood at only 9 million tons indicating significant and rapid growth over the past six decades. Global production of chicken meat amounted to approximately 103.3 million metric tons in 2024, according to the most recent statistics published by the USDA. (5)

The poultry meat outlook Demands for global poultry meat continues to increase as there are predictions that, by 2032, the sector is expected to be responsible for approximately least 50% of growth in world meat production according of Organisation of Economic Cooperation and Development (6) and Food and Agriculture Organisation (FAO) at a rate of 1.3% per year. The development of the biotechnologies, genetic progress, and automation for feeding and handling reduce both production costs and environmental impact on this fundamental sector (7).

#### **Second: The Fact of Poultry Industry in Iraq and Nineveh Governorate**

The poultry industry in Iraq, particularly in Nineveh province, has undergone different stages of development and regression influenced by economic, security and political instability as well as constraints associated with low levels of governmental support, high costs of production and marketing difficulties. Taking into account the present positions discussed here and in line with the introduction on maximized output of

Iraqi poultry industry (Nineveh Governorate), while at the same time highlighting and identifying most important issues facing it as a preliminary factor for study of decline reasons and development potentials.

For the mean value in the period 2003–2023, it is found that local production averaged 89.3 thousand tons, against an average annual consumption of 178 thousand tons from which results an equal gap on yearly basis, as amounting to -148 thousand ton; a self-sufficiency rate of no more than 50.2%. The data shows that the relative improvement in production during the recent years (2020-2023) was not enough to achieve satisfactory levels of self-sufficiency, as self-sufficiency ranged between 30% and 40%, indicating the continued reliance of Iraq on imports to meet local demand, given the limited development of local production capacities.

Nineveh Governorate was more affected by security conditions, which was reflected in the decline in the number of projects to its lowest levels. In 2009, the number of projects did not exceed 19. In contrast, the governorate recorded the highest number of projects in 2022, with 482 projects, accounting for 18.3% of the total number of broiler projects in Iraq for that year. The general average of the number of producing projects in Nineveh during the studied years was around 146 projects, reflecting a sharp fluctuation between periods of stagnation and revival, mainly linked to changes in the security environment and political stability. (8)

Third: Analysis of Poultry Farm Survey in Nineveh Governorate

Data was collected from 43 poultry farms to study the reality, and the results came as follows:

First: Basic Data about the Farm

1. Type of Farm

The survey results showed that the vast majority of farms (93%) operate in broiler chicken farming, while the percentage of farms that raise laying hens was only 7%. No farms were recorded that operate in mixed farming (eggs + meat) or raising other types of poultry. This distribution indicates that broiler chicken farming dominates the nature of poultry production in the studied sample, reflecting the farmers' orientation in the region towards meat production to meet the increasing local demand.

2. Number of Poultry on the Farm

The results showed that a large percentage of farms (77%) contain more than 5000 chickens, indicating that most of the studied farms are considered semi-commercial to commercial production projects. Meanwhile, 16% of farms have a number ranging between 2000 to 5000 chickens, and only 7% have between 500 to 2000 chickens. No farms were recorded with less than 500 chickens, indicating the absence of very small

farms or household production within the selected sample.

3. Duration of Farm Operation

The results showed that 47% of farms have been operating for a period ranging between one to five years, reflecting that a large number of projects are relatively new but have surpassed the initial establishment stage. In contrast, 42% of farms were within the category of operating for less than a year, indicating a relatively new trend towards investment in this sector. Farms with long experience that have been operating for more than five years accounted for a limited percentage (11%) only. This distribution demonstrates the relative strength of the poultry industry in the region and a newfound eagerness to invest in it, but it also shows some challenges with regard to the fact that many farms have little or no cumulative experience.

**Analysis:**

-Dependence on intermediaries suggests that producers have inadequate power over the price of their commodities.

-Underleveraged digital marketing is a missed opportunity to increase marketing ROI and reach customers.

Demand being stable or even growing slightly, obliges to look for new marketing methods and to increase product's quality in order to create extra value.

Third: Challenges in Production

-What are the production challenges you find?

Responses further revealed that most of the farmers, 77% also pointed poultry diseases and veterinary issues as their major problem in production. By contrast, only 23% said that volatility in the price of feed was a major challenge. Lack of skilled labor and infrastructure are not cited by any respondent as issues. These findings demonstrate that animal health is the most important element in the productivity and continuity of a poultry farm, evidencing at the same time, how urgent it is to improve veterinary services and implement prevention policies.

- How are we impacted by changes in the price of energy (electricity, fuel)?

The fluctuation of energy prices (fuel and electricity) significantly affects production operations were agreed on by all respondents(100%). This reflects the high dependence of poultry farms on energy for different production life stages (e.g., heating, lighting, ventilation), putting in an exposed position to rising costs and increasing fuel prices.

-Are there challenges in the supply of feed or raw materials for production?

Potentially associated to problems in supplying feed or raw materials values were obtained within the following range from farmers response: Between 93% of them that do not have a problem

and only 7% which have. That suggests that availability hasn't changed much overall, but shortages may hit some people with higher prices or supply chain woes.

**Analysis:**

- Human-related health problems are a major challenge to the sustainability of production, which requires enhanced awareness and action in care for animals.

-The volatile energy costs impose a continuous financial constraint that pushes towards the quest for alternative energies or energy use optimisation.

-Relative advantage: Feed supply stability is an anthropocentric perspective, whereas it is important to think ahead to the day when feed prices may change in this industry.

**Fourth: Impacts of Government Policies**

-Do you think there's enough government support for the poultry industry?

-Every single survey participant (100%) reported that the government was not supporting the poultry sector adequately.

- Is the policy of government having any influence on cost of production or marketing?

-All, that is 100 percent of the respondents stated that government policies are not very effective in influencing production or marketing costs.

-Do you think of environmental or veterinary legislation as impacting on farm operations?

-For both environmental and veterinary legislation, (35%) of farmers believe these particular legislations have an impact on their farm business.

**Analysis:**

-Disbelief poultry farmers are completely of the belief that no government will help out in any way!

-Not having government backing or intervention would raise the costs and decrease competitiveness of producers locally.

-Effects of minimal environmental and animal legislation differ depending on the farm level, and it must be constantly followed up to not break promises regarding sustainability.

**Fifth: Environmental Trends and Sustainability**

-Are environmentally sound methods used by the farm to manage waste or other residues?

-The survey also indicated that the majority of the farms (88%) utilize environmentally friendly practices in waste and residue management.

-Do you think achieving a lower carbon footprint can boost your farm's efficiency?

-When subjective views on the possibility of production efficiency improvements with reduction in carbon footprint were solicited, 23% farm holders agreed with it.

Are you introduce new technology to increase the environmental efficiency of production?

-No farm owner (100%) has introduced new technologies including those oriented to enhance environmental efficiency in production.

**Analysis:**

- So far only satisfactory attention has been paid to the sustainable disposal of waste but it lags behind achievement elsewhere eg in reducing carbon dioxide (and other greenhouse gas) emissions, or using modern technology.

-Failing to modernize on EE may put the farm at a competitive disadvantage in food markets of today, especially when environmental dimension becomes more important in global markets.

**Sixth: Opinions and Recommendations**

-What do you suggest for increasing the efficiency of production in your farm?

-According to the survey, 81% of respondents point out that the increasing government support is the most necessary factor for improvement of production efficiency in poultry farms.

-Do you have any relevant notes or ideas to help in the development of poultry sector in Nineveh Gov.

-The following were the key developmental notes and concepts:

-Advocating for increased government help.

-Expanding the farm base to achieve economical efficiency.

- Developing and using modern technologies in farm management.

- Enhancing periodic health supervision.

**Analysis:**

- The significant focus on demanding government support indicates the weakness of the supportive infrastructure for the agricultural sector in the governorate and the farmers' need for effective policies to support sustainable growth.

- The presence of demands to update technologies and health supervision indicates awareness of the importance of updating production methods to face local and international market challenges.

**Seventh: SWOT Analysis(9)**

- What are the factors that distinguish your farm from other farms in the region?

The study results indicate that most farms (81%) consider good reputation in the market as the main factor that distinguishes them from others.

- What are the competitive advantages that your farm possesses compared to competing farms?

The results show that quick access to local markets represents the most prominent competitive advantage at 65%.

- What are the factors that negatively affect farm performance?

The results confirmed that the high cost of feed is the biggest obstacle to performance at 86%.

- Are there problems in the supply chain that affect farm productivity?

All participants (100%) confirmed that there are no problems in the supply chain.

- What opportunities do you think you can benefit from to improve production and marketing?  
56% of farmers indicated that expanding into new markets represents the most important available opportunity.

**Analysis:**

- Do you believe there are new opportunities that can contribute to increasing demand for poultry products?

The majority of participants (77%) see future opportunities to increase demand.

- What are the threats that affect the poultry industry in the region?

The results showed that fluctuations in feed prices are the biggest threat (56%).

- Is there strong competition from large farms or commercial companies?

A large majority (84%) of respondents do not feel there is strong competition.

SWOT Matrix for Poultry Farms:

1. Strategy for using strengths to benefit from opportunities (SO)

- Investing in the farm's good reputation to reach new markets.

2. Strategy for addressing weaknesses to benefit from opportunities (WO)

- Investing in updating agricultural technologies and machinery.

3. Strategy for using strengths to face threats (ST)

- Using the good reputation in the market to build consumer trust.

4. Strategy for addressing weaknesses to face threats (WT)

- Diversifying sources of feed purchase to reduce the impact of price increases.

PESTLE Analysis(10)

- Do government policies affect the poultry sector in your region?

The results showed that 23% of respondents believe that government policies affect the poultry sector in their region.

- How do government regulations related to the environment and public health affect production?

77% of participants indicated that the impact is significant.

- How do price fluctuations such as inflation or exchange rate changes affect production costs?

81% of participants confirmed that it has a significant impact.

-Do you think there is a reduction in the cost of production by virtue of government support for the agriculture production?

93% agreed that support can lower production costs.

-How does changing consumption pattern impact the demand of poultry products in the region?

-No demand reduction for poultry products was reported by 77% of the respondents.

**Analysis:**

-Findings indicate the significance of government support and economic forces to the poultry industry, availing it opportunities to improve technological-based cost reduction, efficient natural resources utilization and environmentally friendly systems. It also, however, suggests a relatively solid interest in poultry products and some shift in people's behaviour.

Opportunities for poultry Sector in view of PESTLE analysis equipped are :

1. Political stability related to working in the general government: Lack of major changes assures a constant output without any sudden regulation change.

2. Governmental aid to the agricultural sector: Direct financial governmental aid is a good score for reducing production costs and making farming more profitable.

3.The rising demand for technology in marketing: With predicted use of mobile apps, the chances to attract new customers and increase sales volume is magnified.

PESTLE analysis To threats:

1.Economic teamu (inflation,exchange rates): The continuation of these threats has a major effect on cost and competitiveness.

2.Technology non-uptake in production: The failure to utilize modern technologies can inefficiently compete with the mighty compared to the more advanced producers.

Challenges facing the poultry sector:

1.Dissemination of modern technology: Training for farmers to use technologies to enhance quality and efficiency.

Analysis:

The poultry industry PESTLE analysis indicates that the industry has significant growth opportunities due to both policy stability and government support as well as an upswing in digital marketing and healthy products.

Fourth: Analysis of a questionnaire for consumers of poultry meat in Nineveh Governorate.

For reality, data was collected from (100) poultry consumers, and the results were as follows:

First: Personal information of respondents

1. Gender

The study sample was evenly distributed between males and females, with males accounting for (50%) and females (50%).

2. Age group

-The questionnaire results indicate that the highest percentage (45%) of respondent sample describe to the age bracket 31-45 years.

-Public perceptions of poultry products

2. How often do you purchase poultry?

By the assessment by questionnaire, significantly most of consumers (45%) purchase poultry products twice a week.

Which type of poultry do you like best?

It was found that the most preferred kind is frozen poultry meat by (47%) of respondents.

#### Analysis:

-Part two of the questionnaire reveals that poultry products are being purchased frequently by consumers with frozen poultry preferred and product quality is a significant factor when buying.

#### Third: SWOT Analysis

-What factors determine whether you purchase poultry?

-What are the standards local chicken meat supersedes the imported one by?

-From the results, it can infer that there are differences in these criteria on purchase of local poultry products considering criteria on bought imported product.

-Freshness leads the attributes s at (50%) indicating that buying locally raised poultry for fresh availability was also very important.

- Are there any issues with poultry products in your area?

-The most (95 per cent) of the consumers did not face any difficulty in getting poultry products within their locality.

- What are some of the issues that may confront the poultry industry in the area?

-Challenges facing the poultry sector in the region Around the region, there are several factors to consider.

#### SWOT Analysis:

- Strength:Local fresh availability.

-Weakness: Some lack of supply and high prices.

-Opportunity: Rise in demand for the poultry products in the region.

-Risk: Health issues and issues due to low confidence on local products.

-SO (Using strengths to take advantage of opportunities) arsenal

-Quality beyond belief strategy: Reinforce telegram with the richness of local product freshness.

-Strategies to overcome the limitations so as to benefit from opportunities (WO)

- Cost lowering policy: Enhance productivity and apply new production techniques to reduce costs.

-Strengths to face threats (ST) profile strategy

-Growing the customer base: Penetrate new consumer categories with targeted advertising.

-How to Compose Weaknesses To Confront Threats (WT)

-Health and safety improvement: Good health standards must be observed from the production to sales stage.

-Consumer SWOT analysis in the Poultry industry:

-Strengths: The quality of the local products, the availability of fresh articles.

-Weaknesses: Steep prices, and at times lack of availability.

-Opportunities: Growing demand for poultry products in the region.

-Threats: Health issues, low confidence in local products.

- Government policies:

73% of respondents feel that the government's policies have a great impact on prices and availability in the local market.

-Veterinary regulations:

80% of participants considered that veterinary legislations and constraints influence negatively local production.

-Prices:

Poultry prices are high for 30% of consumers as against other food products.

-Economic changes:

Three-quarters of consumers note that economic change is impacting their ability to make poultry purchases.

-Organic and natural products:

45% of 4consumers are seeing heightened interest in organic and natural poultry.

-Online shopping:

90% of consumers do not like to purchase poultry from apps, or websites.

-PESTLE analysis of poultry industry:

Government policies: They influence the prices of poultry and its availability.

Veterinary legislation: Affect the local production.

Prices: Influenced by the balance of supply and demand, as well as overall economic conditions.

Economic shifts: Affect ability of consumers to purchase poultry.

- Organic and natural products: There's growing interest in these products.

- Technology: Online shopping is not popular among consumers.

Suggestions to improve the poultry industry in Nineveh Governorate:

1. Government support for field owners and slaughterhouses and banning imports.

2. Activating the role of the state to support slaughterhouses and increase their numbers.

3. Government support for poultry farms and opening new slaughterhouses.

4. Government support for livestock production, especially poultry farms.

5. Supporting local field owners and slaughterhouses by the local government.

6. Establishing additional farms and supporting them by the state and providing veterinary treatments to develop them.

These suggestions aim to improve the poultry industry in Nineveh Governorate by:

- Supporting field owners and slaughterhouses.

- Increasing investments in the poultry sector.

- Improving slaughterhouse services.
- Providing necessary support to field owners and slaughterhouses.
- Developing the poultry industry by providing necessary veterinary treatments.

## Results and Conclusions:

1. Poultry farms:
  - High production costs.
  - Lack of government support and agricultural guidance.
  - Weak infrastructure.
  - Lack of knowledge about modern marketing methods.
2. Consumers:
  - Preference for buying live poultry.
  - Economic factors influence purchasing decisions.
  - Relative health awareness, but lack of full trust in local product quality.

## Recommendations:

1. Adopt a national local strategy for marketing poultry products.
2. Activate veterinary, production, and marketing guidance.
3. Upgrade poultry farm infrastructure.

4. Encourage the establishment of modern, integrated slaughterhouses.

5. Establish associations or cooperatives for poultry farmers.

These recommendations aim to improve the poultry sector in Nineveh Governorate by:

- Enhancing production efficiency.
- Developing marketing strategies.
- Improving infrastructure.
- Encouraging the establishment of modern slaughterhouses.
- Supporting poultry farmers.

## The Augmented Dickey-Fuller (ADF) test

is one of the most important statistical tests used to verify the stationarity property in time series, by testing for the presence of a unit root. The importance of this test lies in determining whether the time series is stable around a constant mean or contains a time trend or random walk, which may lead to misleading estimation results when using standard models without addressing the issue. The ADF test results indicate that all the studied variables are non-stationary at the level, as evidenced by the high probability values (greater than 0.05). However, after taking the first difference, most of the variables became stationary, as shown in Table (1).

**Table 1.** Results of the stationarity test using the Augmented Dickey-Fuller test.

UNIT ROOT TEST RESULTS TABLE (ADF)								
Null Hypothesis: the variable has a unit root								
At Level								
		LOGY	LOGX1	LOGX2	LOGX3	LOGX4	LOGX5	LOGX6
With Constant	t-Statistic	0.0756	-1.1391	-0.6513	-1.8234	-1.6333	-1.7879	-2.3781
	Prob.	0.9597	0.6905	0.8471	0.3640	0.4559	0.3797	0.1543
With Constant & Trend	t-Statistic	-2.0795	-1.3507	-2.9095	-2.3318	-0.9609	-1.5096	-2.1382
	Prob.	0.5407	0.8597	0.1707	0.4060	0.9374	0.8058	0.5092
Without Constant & Trend	t-Statistic	1.7434	-0.7544	1.4741	0.7292	-0.3140	-0.1933	-0.6219
	Prob.	0.9785	0.3831	0.9629	0.8682	0.5656	0.6090	0.4411
At First Difference								
		d(LOGY)	d(LOGX1)	d(LOGX2)	d(LOGX3)	d(LOGX4)	d(LOGX5)	d(LOGX6)
With Constant	t-Statistic	-6.6183	-6.0033	-6.8560	-4.1179	-7.2373	-2.0436	-4.8512
	Prob.	0.0000	0.0000	0.0000	0.0028	0.0000	0.2678	0.0003
With Constant & Trend	t-Statistic	-6.7014	-6.1519	-6.7578	-4.2198	-5.1665	-2.9009	-5.2331
	Prob.	0.0000	0.0001	0.0000	0.0106	0.0009	0.1759	0.0007
Without Constant & Trend	t-Statistic	-3.1861	-6.0828	-6.0828	-3.6962	-7.3422	-2.0981	-4.8872
	Prob.	0.0022	0.0000	0.0000	0.0005	0.0000	0.0362	0.0000
Notes:		(*)Significant at the 10%; (**)Significant at the 5%; (***) Significant at the 1% and (no) Not Significant						

source: Prepared by the researcher based on the outputs of EViews 12.

Therefore, these results justify the use of ARDL (Autoregressive Distributed Lag) models, which are suitable for dealing with a mixture of variables. Through analyzing the results of the Lag Length Selection Criteria, it was determined that the most appropriate model is ARDL (3, 3, 2, 3, 3, 3, 2), where a lag period of (3) was chosen as the best period for almost all variables, based on the five lag selection criteria used, particularly the Akaike Information Criterion (AIC), which indicated the lowest value at this period, reflecting the best fit for the model. Table (2) presents the details of the lag length selection criteria

**Table 2.** Results of Lag Length Selection Criteria for the Vector Autoregression (VAR) model.

VAR Lag Order Selection Criteria						
Endogenous variables: LOGY LOGX1 LOGX2 LOGX3 LOGX4 LOGX5 LOGX6						
Exogenous variables: C						
Sample: 2004S1 2023S2						
Included observations: 37						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	-2856.087	NA	3.84e+58	154.7615	155.0662	154.8689
1	-2680.280	275.5890	4.26e+55	147.9070	150.3452*	148.7666
2	-2617.021	75.22686*	2.65e+55*	147.1363	151.7078	148.7480*
3	-2555.423	49.94490	3.35e+55	146.4553*	153.1602	148.8191

\* indicates lag order selected by the criterion  
 LR: sequential modified LR test statistic (each test at 5% level)  
 FPE: Final prediction error  
 AIC: Akaike information criterion  
 SC: Schwarz information criterion  
 HQ: Hannan-Quinn information criterion

Source: Prepared by the researcher based on the outputs of EViews 12.

The symbol (\*) indicates that the selection was made according to this criterion, as shown in Figure (1), which illustrates the optimal lag periods used in constructing the ARDL mod

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