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E-mail: mv.fmv@euba.sk

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EXTERNAL MACROECONOMIC IMBALANCES IN SLOVAKIA: ITS DEVELOPMENT AND SYNCHRONIZATION

Pavla Bednářová,[1] *Vladimíra Hovorková Valentová*[2]

The main and original aim of the paper is to identify the spatial synchronization of external macroeconomic imbalances in Slovakia with EU countries from 2013 to 2022. The required results are obtained using the five Scoreboard indicators of Macroeconomic Imbalance Procedure and furthest neighbour agglomerative method of cluster analysis, with the resulting dendrogram. External Macroeconomic Imbalances in Slovakia were significantly synchronized with Baltic States and Central European countries in 2014 and 2022. In 2017 and 2020, macroeconomic imbalances exhibited similarities with the southern EU countries. At the same time, Slovakia faced a loss of external competitiveness.[3]
Key words: macroeconomic imbalance procedure, external macroeconomic indicators, Slovakia, cluster analysis, dendrogram
JEL: F15, O52, O57

1 INTRODUCTION

In 2023, Slovakia was assessed in the In-Depth Review for Slovakia. The European Commission approaches the elaboration of a deeper analysis within the Macroeconomic Imbalances Procedure (MIP) for countries with potential macroeconomic imbalances. As part of this procedure, indicators characterizing the macroeconomic situation, nominal and real convergence, including other aspects of trade performance, and data on foreign liabilities, including foreign direct investment and net

[1] Doc. PhDr. Ing. Pavla Bednářová, Ph.D., Department of Economics, Faculty of Economics, Technical University of Liberec, Studentská 1402/2, 461 17 Liberec 1, e-mail: pavla.bednarova@tul.cz. https://orcid.org/0000-0002-5397-4488
[2] Ing. Vladimíra Hovorková Valentová, Ph.D., Department of Economic Stastistics, Faculty of Economics, Technical University of Liberec, Studentská 1402/2, 461 17 Liberec 1, e-mail: vladimira.valentova@tul.cz. https://orcid.org/0000-0001-5718-315X
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foreign debt, are analysed. The main reasons for this review for Slovakia are persistent concerns related to cost competitiveness, external accounts, government finances, house prices and household debt. This in-depth review on the prevention and correction of macroeconomic imbalances presents the main findings on the gravity and evolution of the challenges identified, as well as policy responses and potential policy needs (EC 2023a).

The main and original aim of the article is to identification the spatial synchronization of external macroeconomic imbalances in Slovakia with EU countries using cluster analysis statistical method from 2013 to 2022. The partial aim is to evaluate the development of external macroeconomic imbalances in Slovakia. This information can be an important indicator for early warning of adverse economic developments, as the high degree of interconnectedness of EU countries allows and encourages spillover effects between countries. By effectively monitoring and timely addressing macroeconomic imbalances, policymakers can mitigate risks, increase economic resilience, and promote sustainable growth.

Macroeconomic imbalance is defined in Regulation (EU) No. 1176/2011 on prevention and correction of macroeconomic imbalances as: "*any trend giving rise to macroeconomic developments which are adversely affecting, or have the potential to adversely affect, the proper functioning of the economy of a Member State or of the Economic and Monetary Union, or of the Union as a whole"* (EUR-LEX 2011, p. 4). The magnitude of the imbalance refers to the size of the obstacles to the proper functioning of economic activity, and to the risk of sudden correction, i.e. the probability of its correction occurring in a given period. In general, it is possible to consider any economic variable and evaluate, using these variables, the probability of a large change (or change in their combination) in the next period. However, not all cases of imbalances are a cause for concern or require policy intervention, as they may be part of a dynamic adjustment of the economy. The EU has implemented the MIP to address and rectify destabilising economic imbalances within its member states. The MIP commences annually with the Alert Mechanism Report (EC 2024), in which macroeconomic imbalances are monitored through five indicators of external position and competitiveness (current account balance, net international investment position, real effective exchange rate, export market share and nominal unit labour cost index), six indicators of internal macroeconomic imbalances (house price index, private sector credit flow, unemployment rate, private sector debt, general government gross debt and total financial sector liabilities), and three indicators of unemployment (activity rate, long-term unemployment rate and youth unemployment rate). The results of the study by Frankel and Saravelos (2012) were used as a theoretical basis for the selection of appropriate indicators of macroeconomic imbalances in the Scoreboard. In designing the Scoreboard, the European Commission worked with the Council, the European Parliament and the European Systemic Risk Board (ESRB). These fourteen main indicators are complemented by twenty-eight MIP auxiliary indicators,

which provide additional information related to macroeconomic situations, nominal and real convergence within and outside the European Union and the eurozone. The auxiliary indicators broaden the information base for understanding potential imbalances as well as the adjustment capacity of the economy. Details on the definitions of the MIP indicators can be found in the Scoreboard (EC 2012), Eurostat (2024) or Alert Mechanism Report (EC 2024).

2 LITERATURE REVIEW

The Macroeconomic Imbalances Procedure aims to prevent and correct such imbalances to maintain the overall economic health of the EU (Hodson 2018). Gros (2012), Sella, Vivaldo, Groth and Ghil (2016), Bandrés, Gadea-Rivas and Gómez-Loscos (2017) identified links and synchronization between economic growth, economic cycle and macroeconomic imbalances. They also examined correlations for Europe at both national and regional levels and showed that the degree of homogeneity of regional economic cycles within countries is quite different and that spatial correlation has increased during the convergence process towards the introduction of the euro. Bednářová and Hovorková Valentová (2016, 2017) examined the process of imbalance accumulation in the euro area. They found that, over the period under review, non-euro area countries responded to economic shocks with a higher degree of similarity and lower volatility than euro area countries, while the post-crisis recovery was faster and more intense in these countries and recommend that countries joining a currency union should focus more on meeting the criteria ex ante rather than ex post. The deterioration of economic, social and political stability and cohesion in the EU since 2007 has also been confirmed by Casagrande and Dallago (2021).

Other studies focus on the possibility of predicting economic crises depending on the development of macroeconomic imbalances. The ECB Occasional Paper (ECB 2018) reviewed the process of accumulating imbalances in the euro area and their unwinding over the past 20 years, concluding that if these indicators had been properly monitored in the first decade of EMU, they would have predicted the crisis well in advance. Frieden and Walter (2017) highlighted that the Eurozone crisis shares many characteristics with previous debt and balance of payments crises. Identifying crises and even classifying their severity has been achieved by Biegun and Karwowski (2020), who also defined the concept of so-called multidimensional crises based on several economic indicators such as GDP decline, inflation or depreciation of the national currency. In the following study, Biegun, Dahl, and Karwowski (2024) tested the ability of MIP to predict changes in GDP that can be considered as proxies for economic deterioration or improvement by using MIP auxiliary indicators. The results showed that only four main indicators and four auxiliary indicators were able to predict the upcoming crisis.

According to Bricongne, Mata Garcia and Turrini (2019) or Schuller and Sondernann (2019), credible and decisive structural reforms are key to resolving

macroeconomic imbalances. They have shown that the structural reforms implemented in euro area countries have increased resilience, reduced structural unemployment and increased productivity and growth potential in the euro area. Institutional integration as a solution to the euro area crisis detected by Mongelli, Dorrucci, Ioannou and Terzi (2015) or Koll and Watt (2022). On the other hand, Bénassy-Quéré and Wolff (2020) looked at how the macroeconomic imbalances worked in practice and recommended streamlining the Scoreboard, involving national macroprudential councils, better linking the different recommendations and further involving the Commission in the national policy debate. Koll and Watt (2022) even point to the need for an overall more radical reform of the MIP because of the demonstrated close link between macroeconomic imbalances and fiscal results, as Heinemann et al. (2018) and Coelho (2019). A reformed MIP could serve as a useful complement to the Stability and Growth Pact.

Slovakia is among the countries with the highest share of exporting companies. The manufacturing sector is the main engine of growth in Slovakia, which is why the country is sensitive to external shocks due to the high level of integration in global value chains. To analyse the development of external macroeconomic imbalances in Slovakia, it is important to consider the various factors that affect the country's economic stability, as detected Harkman and Staehr (2018) or Domonkos et al. (2017). They identified the factors that drove the current account dynamics of the eleven Central and Eastern European EU members. The current account showed considerable persistence in both cases. For floaters, the current account was driven by domestic factors, while for fixers the current account was driven mainly by external factors. The analysis demonstrated the importance of the exchange rate regime for the drivers of the current account balance in the CEE countries. Nguyen and Rondeau (2019) analyzed the transmission and synchronization of economic cycles, especially in the context of EU enlargement and the adoption of the euro, and provided insight into how the Slovak economy interacts with its European partners.

Możdzierz (2015) analysed the development and determinants of macroeconomic imbalances in the surveyed countries, including Slovakia, in 2004-2013. He identified common characteristics of the economies under study that are typical of countries in economic transition, catching up with the advanced EU countries. The implementation of this conclusion can be seen in the fact that some indicative thresholds are different for euro area countries. Čajka (2010) was primarily focused on the comparison of real and nominal convergence in two EU economies, namely Slovenia and Slovakia, which adopted the single European currency at the beginning of 2007 and 2009, respectively. He proved that if country “naturally” (in economic terms) comes to the fulfillment of nominal convergence criteria, then it doesn’t have to worry much about possibly negative impact of joining of the euro area (especially loss of autonomous monetary policy). The negative impact of the economic and financial crisis on the external balance in Slovakia was examined by Čajka, Gajdůšková and Bolotov (2011). Knapková,

Kiaba and Hudec (2019) identified the impacts of macroeconomic indicators on public debt of the Slovak Republic, just like Gomez-Puig nad Sosvilla-Rivero (2018). Macroeconomic indicators, which authors proved to be statistically significant, were GDP growth rate, openness of economy, size of public sector, government bond yields, and unemployment rate.

3 DATA AND METHODOLOGY

The procedure for macroeconomic imbalances is a mechanism of supervision and enforcement of rules, which is aimed at preventing and correcting macroeconomic imbalances within the European Union. The MIP procedure is defined in two regulations, in Regulation of the European Parliament and the Council (EU) no. 1176/2011 of November 16, 2011 on the prevention and correction of macroeconomic imbalances and in Regulation of the European Parliament and the Council (EU) no. 1174/2011 of 16 November 2011 on enforcement measures to correct excessive macroeconomic imbalances in the euro area (EUR-Lex 2011). Both parts of supervision (preventive and corrective) are clearly timed and fit into the course of the European Semester (EC 2016). External macroeconomic imbalances are monitored through five indicators: current account balance (% of GDP, 3 year average), net international investment position (% of GDP), real effective exchange rate (42 trading partners, HICP deflator, 3 year % change), export market share (% of world exports, 5 year % change), nominal unit labour cost index (2015=100, 3 year % change) – see Table 1. The definition of individual indicators on the Scoreboard includes their calculation and thresholds (EUROSTAT 2024). The existence of macroeconomic imbalances in the individual countries is detected in the case when the indicator threshold values are exceeded and these thresholds can differ for countries which are part of the eurozone and for the European countries which have not been participating in the project of the single currency yet.

Cluster analysis aims to group objects, such as EU countries, based on their similarity in the examined indicators. Countries within the same cluster are very similar, while those in different clusters show significant differences. The standardized squared Euclidean distance, as mentioned in Everitt et al. (2011), is used as the basic metric:

$$D_N(i,i') = \sqrt{\sum_{j=1}^{p} d_j^2\,(i;\ i')/s^2(x_j)} \qquad (1)$$

$$\text{where } d_j(i;\ i') = x_{ij} - x_{i'j}\ , j = 1, 2, \dots, p$$

The reason why this metric was chosen was the need of expressing the observed indicators in different units of measurement. However, it requires the observed indicators to be uncorrelated. To ensure this, a Pearson's correlation coefficient is calculated for each pair of observed indicators, and a t-test is performed at the 5% significance level (test for zero population correlation). This test can demonstrate the correlation between variables,

as stated in the alternative hypothesis. The procedure for calculating the Pearson's correlation coefficient is described by Black (2010):

$$r = \frac{\sum(x-\bar{x})(y-\bar{y})}{\sqrt{\sum(x-\bar{x})^2 \sum(y-\bar{y})^2}} \quad (2)$$

The t-test criterion from the test for zero population correlation was published e.g. by Newbold, Carlson and Thorne (2013):

$$t = \frac{r\sqrt{n-2}}{\sqrt{1-r^2}} \quad (3)$$

Table 1: Indicators of External Macroeconomic Imbalances

Indicator	***Definition***	***Threshold***
Current account balance (**CA**)	$\frac{\left(\frac{CA}{GDP}\right)_t + \left(\frac{CA}{GDP}\right)_{t-1} + \left(\frac{CA}{GDP}\right)_{t-2}}{3}.100$	< -4 % >6 %
Net international investment position (**NIIP**)	$\frac{NIIP_t}{GDP_t}.100$	< -35 %
Real effective exchange rate (**REER**)	$\frac{(REER\_HISC\_42)_t - (REER\_HISC\_42)_{t-3}}{(REER\_HISC\_42)_{t-3}}.100$	± 5 % (EA) ± 11 % (non EA)
Export market share (**EXP**)	$\frac{\left(\frac{EXP_c}{EXP_{world}}\right)_t - \left(\frac{EXP_c}{EXP_{world}}\right)_{t-5}}{\left(\frac{EXP_c}{EXP_{world}}\right)_{t-5}}.100$	< -6 %
Nominal unit labour cost index (**ULC**)	$\frac{(ULC)_t - (ULC)_{t-3}}{(ULC)_{t-3}}.100$	+ 9 % (EA) + 12 % (non EA)

Source: own processing based on data from EC (2017) and EC (2024).

To maintain objectivity, it is necessary to exclude indicators that are highly correlated with other indicators from the analysis, preventing potential bias in the results. The furthest neighbor method, one of the hierarchical agglomerative methods, is used to cluster the objects. This method clusters variables on the basis of the minimum distance between the outermost elements of the cluster. The clusters are graphically portrayed by a dendrogram, and the final number of clusters is determined heuristically. The presence of outlying objects may cause the results of the analysis to be biased.. An EU country may have observed indicator values so far removed from the others that they form a separate cluster. However, a separate cluster may also be formed by a country that is not an outlier. An appropriate test must be used to determine whether a country is an outlier or not. The testing and identification of outliers is addressed by Davies and Gather (1993). Cluster analysis is a state-based method that only captures where countries stand

in the year for which we have the selected indicators. In order to capture the evolution of the positions of the EU countries in relation to the evolution of the external imbalance indicators, a cluster analysis is carried out in four selected years, 2014, 2017, 2020 and 2022, using data from the Alert Mechanism Report (EC 2024) and Eurostat (2024). Instead of static cluster analysis, it would be possible to use its dynamic version, which would allow tracking changes over time. However, we did not choose this option, as the development of economic imbalances is not so dynamic, and it would not be possible to illustrate clusters in individual periods using a dendrogram. The static form of cluster analysis makes it possible to observe which countries formed clusters in the monitored periods, analyze the reasons for some countries moving into a different cluster, work with the number of clusters in the monitored periods, etc. A significant additional advantage of the static model is its easier interpretation.

4 Development of external macroeconomic imbalances for Slovakia

Macroeconomic development in Slovakia is closely connected with the overall economic development of the EU, when in 2014, EU countries experienced a moderate economic recovery with low inflation and growing current account surpluses, due to low oil prices and very accommodative monetary policies. More than half of the Member States reported significantly negative values for the indicator of the net investment position. Trends in cost competitiveness were in line with external adjustment needs. However, 18 EU countries still recorded a cumulative loss in their share of world exports. In 2017, EU countries experienced nominal GDP growth, which had a positive impact on correcting external macroeconomic imbalances. The majority of EU countries experienced an improvement in their net investment position with regards to the external environment, although some still maintained a highly negative position. This was supported by a recovery in export demand within the EU and increased competitiveness, resulting in an increase in their share of world exports. Although unit labour costs began to rise with the economic recovery, growth remained relatively subdued. The COVID-19 pandemic has resulted in a severe economic crisis across all EU countries, temporarily impacting their external positions and competitiveness. This has had a significant effect on countries with a significant cross-border tourism sector. In 2020, economic activity was disrupted, output declined sharply, and government initiatives to maintain jobs led to an increase in unit labour costs and a reduction in overall labour productivity. The positive economic development in EU countries in 2022 was stopped by the price shock after the Russian invasion of Ukraine, which unleashed unprecedented inflation, which, together with a reduction in purchasing power and a significant tightening of monetary policy, led to a noticeable slowdown during the year. Export performance weakened against the background of subdued world trade and current account balances of almost all member states declined significantly. Economic development and specific values of Slovakian

external macroeconomic imbalances indicators in the period under review are presented in the Table 2.

Table 2: External macroeconomic imbalance indicators

	Threshold	***2013***	***2014***	***2015***	***2016***	***2017***	***2018***	***2019***	***2020***	***2021***	***2022***
Current account balance (**CA**)	-4%/+6%	-0.7	1.3	0.3	-1.2	-2.2	-2.3	-2.5	-1.7	-2.2	-3.6
Net international investment position (**NIIP**)	-35%	-62.0	-63.4	-63.6	-66.6	-68.2	-69.4	-65.6	-64.7	-60.5	-61.0
Real effective exchange rate (**REER**)	±5% (EA) ±11% (non-EA)	2.1	1.2	-1.2	-1.6	-1.9	2.5	2.5	5.2	3.1	3.8
Export market share (**EXP**)	-6%	-4.3	1.7	3.9	7.1	4.8	1.9	1.1	7.2	-1.9	-6.6
Nominal unit labour cost index (**ULC**)	9% (EA) 12% (non-EA)	3.4	3.0	2.5	4.0	7.8	11.3	14.2	15.4	12.6	13.3
Real **GDP** (1 year % change)		0.6	2.7	5.2	1.9	2.9	4.0	2.5	-3.3	4.8	1.8
EU Real GDP (1 year % change)		-0.1	1.6	2.3	2.0	2.8	2.1	1.8	-5.6	6.0	3.4
EA Real GDP (1 year % change)		-0.2	1.4	2.0	1.9	2.6	1.8	1.6	-6.1	5.9	3.4
Inflation (1 year % change)		1.5	-0.1	-0.3	-0.5	1.4	2.5	2.8	2.0	2.8	12.1

Note: Figures highlighted are the ones at or beyond the threshold.
Source: own processing using Eurostat (2023) and EC (2024).

External macroeconomic imbalances are linked to the economic performance and interdependence of the EU countries. Slovakia showed higher real GDP growth rates compared to the EU and EA average in 2013-2019. Despite the fact that the economic downturn in 2020 was lower than in the EU and EA, the post-crisis recovery is slower and in 2022 the GDP growth rate was half that. This was subsequently reflected in the deterioration of the external position and competitiveness, which significantly worsened in 2022, three indicators were beyond the indicative threshold values, namely the net international investment position, export market share and nominal unit labour cost index. The value of net investment position indicator exceeded the indicative threshold value throughout the monitored period and was significantly negative. The net foreign investment position provides an aggregated view of the net financial position (claims minus liabilities) of a country vis-à-vis non-residents, which enables an analysis of the dynamics of the country's foreign position vis-à-vis the rest of the world. For a deeper

understanding of the degree of vulnerability of a country, in addition to the size of the NIIP, its composition is also important, namely the separation of liabilities that require the payment of principal or interest separately from liabilities that do not generate debt. For these reasons, the risks to the Slovak economy were limited, since a significant part of foreign liabilities is related to direct foreign investments, mainly in the automotive industry and the financial sector. These are therefore primarily liabilities without risk of default.

A more pronounced negative impact on external competitiveness was the development of nominal unit labour costs, which have been steadily increasing since 2017, exceeded the threshold for EA countries in 2018, and even exceeded the threshold for non-EA countries from 2019. Nominal unit labour costs rose due to high wage growth in the context of a tight labour market situation and a more dynamic convergence towards the EU average already before the pandemic. In 2020, their growth accelerated further in connection with the COVID-19 pandemic and the effect of labour accumulation on labour productivity. In the last decade, Slovakia saw a drop in productivity from 82% per person in PPS to 73% of the EU average in 2022 (EC 2023). The subsequent growth in nominal unit labor costs was primarily a consequence of the high rate of core inflation, which was overall well above the level of the Eurozone and the EU. This development has had a negative impact on current account deficits, which are gradually worsening, also in connection with the high concentration of exports in several sectors and integration into global value chains.

The largest share of exports of goods from Slovakia is occupied by the traded category Machinery and transport equipment, which also includes cars. Although anti-pandemic measures in the country limited vehicle production in 2020 and 2021, and in 2022 the Slovak automotive industry had to cope with problems in supply chains, the value of exported machinery and transport equipment increased by almost 11% year-on-year. Although this was the highest growth in the last ten years, the share of this class in total exports decreased slightly. While it accounted for approximately 61% in 2021, in 2022 machinery and transport equipment accounted for less than 58% of total exports. The absolute majority, 80% of exported goods, went to EU member states and the volume of these exports increased by almost 17% year-on-year, exports to countries outside the EU increased by more than 14%. Even so, Slovakia struggled with a decreasing share of export markets. According to Eurostat's definition (EUROSTAT 2024), the Export market share indicator measures the degree of importance of a country within the total exports of the world. Therefore, a loss of export market share can occur not only due to a decline in exports but also due to a deterioration in the relative position on the world market. This happens when a country's exports grow at a slower rate than world exports. The indicator calculates a five-year percentage change, reflecting the values of structural loss of competitiveness.

5 CLUSTER ANALYSIS OF EXTERNAL MACROECONOMIC IMBALANCE INDICATORS

Cluster analysis is used to demonstrate the similarity or dissimilarity of external macroeconomic imbalance indicators of Slovakia with other EU countries. Table 3 shows the uncorrelated external macroeconomic indicators used for the analysis and the identification of outliers.

Table 3: Cluster analysis of external macroeconomic imbalance indicators

Year	*Uncorrelated indicators*	*Identification of outliers*
2014	NIIP, REER, EXP	UK (F = 2.958, P-Value = 0.052 Czech Republic (F = 2.235, P-Value = 0.109) All EU countries were analyzed
2017	NIIP, REER, EXP, ULC	Greece (F = 1.857, P-value = 0.1509) Romania (F = 1.726, P-value = 0.1772) All EU countries were analyzed
2020	NIIP, EXP, ULC	Ireland (F = 4.592, P-Value = 0.0112) Ireland was excluded from the analysis
2022	CA, REER, EXP	All EU countries were analyzed

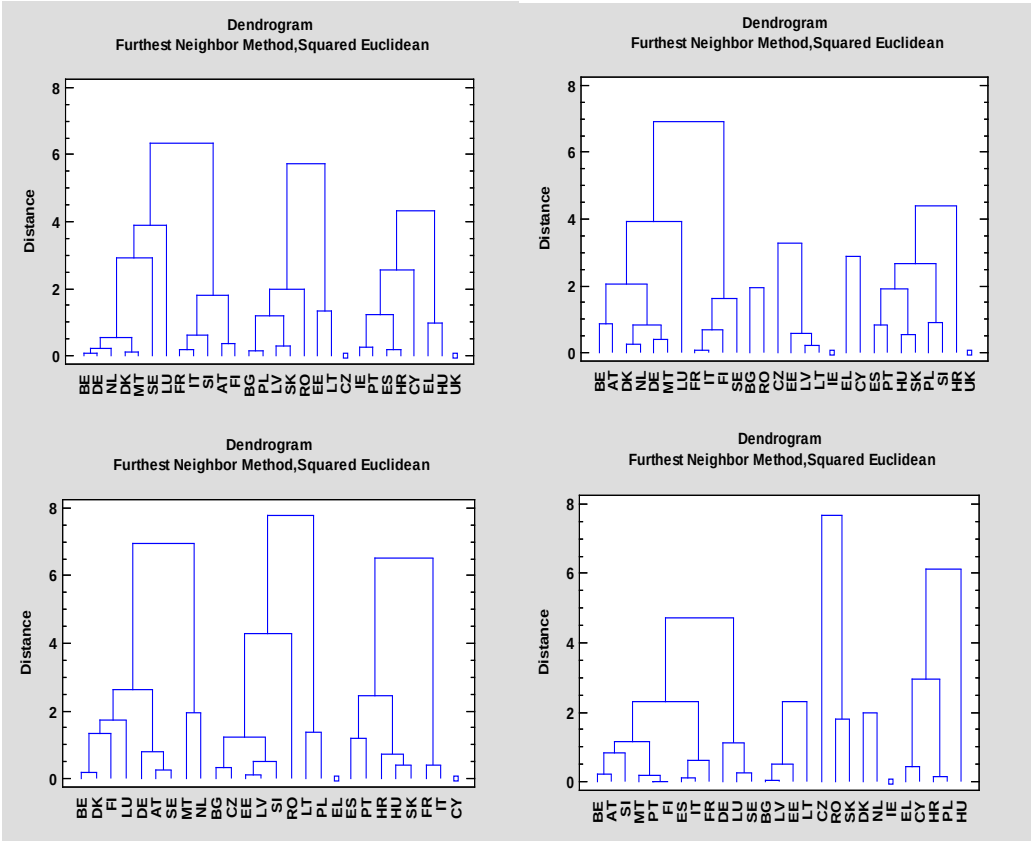
Source: Authors' own data obtained using STATGRAPHICS Centurion XVIII

The results of the cluster analysis are shown in the dendrograms in Figure 1. The number of clusters makes it possible to obtain clear and easily interpretable results, since the small distance of the links (distance up to 8 on the y-axis) explains a high degree of mutual similarityin the occurrence of macroeconomic imbalances between countries within each cluster.

The cluster analysis revealed in 2014 three country clusters and identified the Czech Republic and United Kingdom as separate countries whose three-year real effective exchange rate changes differed significantly from those of other European economies. Slovakia, Bulgaria, Poland, Latvia, Romania, Estonia, and Lithuania were comprised in the second cluster. These economies improved their net international investment position and increased their share of export markets by 15.1%. However, their net international investment position was significantly negative (-59.9%). The cost competitiveness of these countries was reduced due to an increase in nominal unit labour costs. This increase reflects a limited labour supply, economic growth driven by domestic demand, and the catching-up effect of other economies. The twelve European countries (cluster 1) had a significant synchronization and collectively had a high net international investment position (15.2%). The indicator for the loss of export market shares gradually approached the threshold, and the countries demonstrated stable development of the change in nominal unit labour costs. The indicators of external macroeconomic imbalances and their development confirm a relatively stable external position and competitiveness. The seven EU countries in a fourth cluster experienced economic

growth, which was reflected in a small current account surplus and improved export performance. In 2014, all countries had a significantly negative net international investment position and experienced a cumulative loss in world export shares (-14.2%). The recovery in cost competitiveness was due to declining nominal unit labour costs and weakening real effective exchange rates.

Fig. 1: Resulting dendrogram 2014, 2017, 2020, 2022



Source: Authors' own data obtained using STATGRAPHICS Centurion XVIII.

In 2017, a dendrogram showed that seven clusters, or rather five clusters and two separate countries, were defined at a comparable level of mutual similarity of external macroeconomic indicators (distance to value 7). Slovakia, Spain, Portugal, Hungary, Poland, Slovenia, and Croatia were grouped together in the sixth cluster. These countries exhibited a negative net international investment position (-66.2%), but conversely, increased their share of export markets (14.2%). The cluster analysis was conducted to evaluate the persistent synchronization of external indicators for eleven EU countries (the first cluster) due to their high positive NIIP values of 28.6%. The other cost competitiveness indicators remained stable. The countries' excellent external position and

growing competitiveness are reflected in a 4.2% increase in export market shares. The second cluster comprised Bulgaria and Romania. They exceeded the threshold of the net international investment position indicator (-45.3%), had an increased export share (28.2%), and experienced a high increase in nominal unit labour costs (12.8%), which poses a threat to cost competitiveness. In third cluster, Baltic States are closely linked to the Czech Republic. These countries have a highly negative net international investment position and have experienced a relatively rapid increase in nominal unit labour costs. Although rising labour costs have had an impact on external price competitiveness, this has been substantially offset by GDP growth. One separate cluster is Ireland, which has a highly negative net international investment position (-149.3%), primarily due to the activities of multinationals. Ireland has long faced significant external volatility. In contrast, the country's share of export markets has significantly increased (64.4%). In another cluster, Greece and Cyprus had a highly negative net international investment position (-132%). The values of the other indicators only marginally declined. The United Kingdom was identified as a separate cluster once again. Bednářová and Hovorková Valentová (2021) also examined the UK's specific position in terms of external macroeconomic imbalances and identified that the UK showed a relatively high degree of synchronization with EU countries only in 2007, but not in the following years.

The dendrogram shows five clusters in 2020, consisting of three clusters and two separate countries. The clustering distance is up to 8. In 2020, Slovakia, Hungary, Croatia, Portugal, Spain, and Italy and were grouped together in the fourth cluster. These countries experienced a significant loss in their net international investment position (-54.5%), a minor decrease in export markets (-0.1%), and only marginal growth in unit labour costs (11.5%). As a result, their overall external position deteriorated. This fourth group only joined the 'core' EU countries at considerably higher clustering distances (26). The first cluster comprised nine core EU countries. This cluster exhibits very good average values for the external investment position (45.5%) and export market share (9.7%) indicators. However, there is a risk associated with the evolution of unit labour costs, which already exceed the threshold with an average value of 10.8%. The second cluster comprises Bulgaria, Czech Republic, Estonia, Latvia, and Slovenia, followed by Romania, Lithuania, and Poland at greater distances. These countries experienced above-average growth in unit labour costs (18.3%), a deterioration in their net international investment position (-27.4%), but an increase in their share of export markets (22.4%). The separate clusters were identified Greece and Cyprus. In the case of Greece, the external position has deteriorated, with a significant overshooting of the thresholds for the export market share (-10.1%) and the net international investment position (-175%). This is due to prolonged public borrowing on concessional terms. In 2020, Cyprus experienced excessive macroeconomic imbalances due to the current account indicator exceeding the indicative threshold, resulting in a large deficit of 10.1% of GDP. The reduction in international tourism and the widening of the deficit in the primary income balance were

the primary causes. Additionally, the net international investment position remained significantly negative.

In 2022, in the third cluster, Slovakia showed a significant similarity only with the Czech Republic and Romania, for the first time in the observed period. This means that in the case of Slovakia, there was a different development of macroeconomic imbalances, as these countries faced a decline in external competitiveness, with the negative development of current account balance (-4.3%), the loss of export markets share (-2.5%) and the appreciation of real effective exchange rate real exchange rate by an average of 6.7%. Subsequently, these countries were connected to the Baltic countries Lithuania, Latvia, Estonia and Bulgaria at higher distances, similar to 2014. Slovakia was connected to core and southern EU countries (cluster 1) only at distances of more than 20, indicating a high degree of dissimilarity. The twelve EU countries in the first cluster also showed a loss on export markets share (-4%), but a positive value of current account balance indicator (2.1%) and a very slight depreciation of the real effective exchange rate, i.e. overall, the countries' external competitiveness improved.

6 DISCUSSION

The results of the cluster analysis show that the main causes of Slovakia's deteriorating external competitiveness are insufficient productivity growth (especially in tradable goods), overdependence on wage-driven growth and a concentrated export structure. Economic policy and action strategies in Slovakia should pay particular attention to strengthening external competitiveness by implementing policies aimed at moderating wage growth, diversifying exports and increasing productivity in order to ensure long-term external sustainability. Given that the increase in nominal unit labour costs is a key driver of imbalances, policies to enhance labour mobility, retraining and automation should be a priority. Targeted reforms could include incentives for productivity-enhancing investment and training in high-tech manufacturing and services. Given the loss of market share in export markets and the high dependence on car exports, policy makers should encourage diversification into high value-added sectors (e.g. electronics, pharmaceuticals, digital services). In addition, there is scope to focus on using EU Recovery and Resilience Facility (RRF) funds for long-term competitiveness reforms that address identified imbalances - in particular innovation and energy transition.

These recommendations are closely aligned with existing Slovak national strategies, namely the National Reform Programme of the Slovak Republic 2024 (MFSR 2025), which emphasises structural reforms, export diversification and labour market flexibility – objectives directly linked to addressing macroeconomic imbalances. Similarly, the Economic Policy Strategy of the Slovak Republic until 2030 (MHSR 2025) prioritises increasing competitiveness through innovation and productivity, which corresponds to the need to contain rising unit labour costs and strengthen the external balance. Integrating lessons from cluster-based surveillance into these strategic

frameworks can further improve policy responsiveness and resilience. Spatial clustering can also serve as an early warning system. If growing imbalances emerge in comparable countries, Slovakia should anticipate similar risks.

The previous case study of the Slovak economy is a contribution to the scientific and professional discussion on the synchronization of European economies in the process of their integration in the EU or the euro area. The unique method is the use of cluster analysis for obtaining a spatial view of the synchronization of macroeconomic imbalances across EU countries compared to the commonly used time series and comparative analyses. This approach can be used for long time periods and for the specific situation and development of each individual European economy. Cluster analysis also allows for the assessment of similarities in the development of macroeconomic imbalances in European countries by determining the so-called final distance in the cluster analysis. The final distance in the cluster analysis thus determines the value common to all countries that entered the analysis and were thus similar to each other in terms of external macroeconomic imbalances. Thus, based on the change in the value of the final distance, it is possible to determine the evolution of homogeneity (lower final distance) or heterogeneity (higher final distance) of the cluster of countries in the European Union, in euro area countries and in non-euro area countries depending on, for example, economic crises or other institutional or political changes, as discussed by Bednářová and Hovorková Valentová (2017). On the other hand, the static nature of cluster analysis, which does not allow capturing the continuous development of macroeconomic imbalance indicators, represents a limitation for research. The potential for further research therefore lies in the use of dynamic cluster analysis (DCA).

7 CONCLUSION

In 2023, Slovakia was assessed in the In-Depth Review. The European Commission approaches the elaboration of a deeper analysis within the Macroeconomic Imbalances Procedure (MIP) for countries with potential macroeconomic imbalances. The main and original aim of the article was to identification the spatial synchronization of external macroeconomic imbalances in Slovakia with EU countries from 2013 to 2022. The statistical method of cluster analysis, the standardized Euclidean squared distance and the nearest neighbor method, was used to determine the position of Slovakia among other EU countries in terms of similarity or dissimilarity in external macroeconomic imbalances. The cluster analysis is represented graphically by a dendrogram and it was performed in four years of the period under review in order to capture development trends – specifically, in the years 2014, 2017, 2020 and 2022. The evaluation was performed with the use of five indicators of external macroeconomic imbalances, which are defined in the Scoreboard.

In 2022, three external macroeconomic imbalances indicators were beyond the indicative threshold values, namely the net international investment position, export

market share and nominal unit labour cost index. The value of net investment position indicator exceeded the indicative threshold value throughout the monitored period and was significantly negative. A pronounced negative impact on external competitiveness was the development of nominal unit labour costs, which have been steadily increasing since 2017. Nominal unit labour costs rose due to high wage growth in the context of a tight labour market situation, a more dynamic convergence towards the EU average, in connection with the COVID-19 pandemic and in a consequence of the high rate inflation. This development had a negative impact on current account deficits and on a loss of export markets, also in connection with the high concentration of exports in several sectors and integration into global value chains.

In 2014, cluster analysis connected Slovakia with the Baltic and Central European countries. These economies improved their net international investment position and increased their share of export markets. The cost competitiveness of these countries decreased due to increases in nominal unit labor costs. This increase reflected limited labor supply, economic growth driven by domestic demand, and a catch-up effect with other economies. In 2017, Slovakia showed similarities with Central and Southern European countries. These countries reported a negative net international investment position but increased their export markets share. In 2020, Slovakia was grouped in a cluster with practically the same countries. In these countries, the loss of the net international investment position again increased significantly, there were a slight decrease in the shares of export markets, and unit labor costs increased marginally. As a result, their overall external position deteriorated. In 2022, for the first time in the monitored period, Slovakia showed significant similarity only with the Czech Republic and Romania. These countries faced a decline in external competitiveness, with a negative development of the current account balance, a loss of share in export markets and an appreciation of the real effective real exchange rate. This information can be an important indicator for early warning of adverse economic developments, as the high degree of interconnectedness of EU countries allows and encourages spillover effects between countries. Economic policy makers can also reduce risks, increase economic resilience and promote sustainable growth by monitoring and timely addressing macroeconomic imbalances.

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IMPACT OF DIRECT INVESTMENT ON ECONOMIC GROWTH OF UZBEKISTAN

Dilrabo Hojiyeva[1]

This research explores the effects of foreign direct investment (FDI), portfolio investment, and gross capital formation (GCF) on the economy of Uzbekistan between 2013 and 2023 with projections to 2029. Through the application of Ordinary Least Squares (OLS) and Vector Autoregressive (VAR) models, the research establishes strong positive relationships indicating that GCF and portfolio investment largely influence economic performance while FDI promotes technology transfer, competitiveness, and exhibits declining returns with time. With a 16% drop in FDI in 2023, investment is forecast to reach $48 billion by 2029. Policy recommendations are for diversification, regulatory overhaul, and investment.
Key words: foreign direct investment, economic growth, portfolio investments, gross capital formation, Uzbekistan
JEL: F21, O11, E22

1 INTRODUCTION

Investments have consistently served as a cornerstone for economic development, particularly in the context of developing Uzbekistan. Since gaining independence in 1991, the country has embarked on an ambitious journey to establish itself as a dynamic participant in the Asian economic system. However, achieving sustainable economic growth has required more than just integration into global markets. It is of utmost importance to implement policy regulations in order to attract, retain, and effectively utilize investments, particularly direct investment flow. This is evident in Uzbekistan's evolving investment policies and its ongoing structural reforms aimed at bolstering investor confidence (Vahobov et al., 2010).

Uzbekistan has experienced significant growth in FDI over the past decade, with cumulative volumes exceeding $78 billion from 2017 to 2024 and projected to surpass $100 billion by the end of 2024. In 2017, the country attracted $1.7 billion in FDI, which

[1] Dilrabo Hodjieva, Department of Foreign Economic Activities, Tashkent State University of Economics, Islam Karimov 49, 100066 Tashkent, Uzbekistan, e-mail: hojiyevadilrabo7@gmail.com. https://orcid.org/0009-0008-9559-5743

steadily grew to $3 billion in 2018 and $8.5 billion in 2019. The trend continued with $8.9 billion in 2020 and reached $10 billion in 2021. Despite a slight decrease in 2022, where investments totaled $9.7 billion, the upward trajectory resumed in 2023, with $7.2 billion recorded by September. By October 2024, Uzbekistan had secured $26 billion in foreign investments, including $24 billion from direct foreign investors, marking a historic peak (Investment results reviewed, 2024). This robust growth reflects the country's structural reforms, improved regulatory environment, and commitment to economic diversification. Uzbekistan's efforts to establish free economic zones, streamline bureaucracy, and provide tax incentives have further enhanced its attractiveness to investors. Additionally, major international projects, such as the China-Uzbekistan-Kyrgyzstan railway and strategic partnerships in green energy, have attracted global interest. These efforts underscore Uzbekistan's position as a growing hub for international business and a key player in the global investment landscape, setting the stage for sustained economic growth and regional influence (CBU, 2024).

Despite promising reforms, the year 2023 brought challenges for Uzbekistan's investment landscape. Direct investments declined by 16%, falling from $2.65 billion to $2.14 billion. This contraction coincided with a record-high current account deficit of $7.8 billion, emphasizing the urgent need to address structural imbalances and reinvigorate investment flows. The Central Bank's data revealed that these figures were not only lower than those of the previous two years but also indicative of broader global trends. According to the United Nations Conference on Trade and Development (UNCTAD), global FDI volumes have been declining, reaching their lowest levels since the global financial crisis. Moreover, UNCTAD reports that funding for sustainable development sectors dropped by over 10% in 2023, with overall global FDI flows falling by 2% to approximately $1.3 trillion (UNCTAD, 2024). Additionally, UNCTAD notes that FDI inflows into developing countries—including Uzbekistan—reached over $2.5 billion in 2023, marking an 86% increase since 2016, though growth has slowed in recent years (UNCTAD, 2024). These dynamics underscore the increasing competition for foreign capital, especially among developing economies (World Bank, 2023).

Uzbekistan's unique advantages position it to compete in this challenging environment. With the largest domestic market in Central Asia, a young and skilled labor force, abundant natural resources, and a rapidly expanding infrastructure, the country offers significant potential for investors. Recent reforms, including the liberalization of currency regulations in 2017 and substantial improvements in the tax and customs systems, have transformed Uzbekistan's business environment (Development strategy center, 2017). These changes contributed to Uzbekistan's dramatic improvement in the World Bank's Doing Business rankings, where it climbed from 166th place in 2012 to 69th place by 2021 (World Bank's Doing Business Rankings Report, 2021). Yet, despite these achievements, FDI levels remain modest relative to the country's potential, necessitating further action (Zayniddinov et al., 2024).

Developing Uzbekistan faces several challenges that hinder sustainable economic growth and investment flows in Central Asia. First and foremost, The country's double-landlocked geographical character limits its opportunities to join the competitive global market. Moreover, increasing population growth burdens the economy with greater demand for jobs and infrastructure. Currently, half of Central Asia's population, over 36.5 million, lives in Uzbekistan (Worldometer, 2025). However, a high unemployment rate persists, which is common in populous countries. This necessitates government efforts to attract more investors to create job opportunities by establishing export-oriented factories. Furthermore, the country's export potential is lower than its import, which challenges the current scenario (Kechagia and Metaxas, 2016). It is highly important to accelerate special economic zones with tax incentives for investors, thereby exporting finished products to neighboring countries. Additionally, free trade agreements with neighboring countries can expand the trading relations with inclusive tax policies, which further impacts trade potential and sustainable growth. Therefore, The study of FDI and its impact on Uzbekistan's economic progress raises significant concern among researchers. The purpose of the current research is to investigate this area using advanced econometric techniques and provide a comprehensive outlook on Uzbekistan's investment landscape. The study applies a Vector Autoregressive (VAR) model and hypothesis testing to analyze the relationship between variables and economic growth. Based on the findings of the research, policy implications are provided below. The article is structured as follows: section 2 discusses the related literature on the topic with research gap, section 3 provides the methodological framework of the study, while section 4 interprets the results of the analysis. The study ends with conclusion section with potential policy recommendations.

2 LITERATURE REVIEW

Key investment forms in Uzbekistan include equity contributions to charter funds, the establishment of foreign-owned enterprises, acquisition of intellectual property, and investments in infrastructure and industrial assets. These forms are crucial to understanding the multifaceted impact of investment. For instance, FDI serves as a catalyst for economic growth by providing capital infusion, facilitating technology transfer, enhancing managerial capabilities, and strengthening export competitiveness. Pulatova (2016) and Imomkulov (2023) have highlighted the role of FDI in enhancing industrial sophistication and diversifying economic outputs in Uzbekistan (Pulatova, 2016). Special economic zones (SEZs), which attract significant FDI, have emerged as focal points for economic transformation, with researchers like Odilbekov (2024) identifying a strong correlation between FDI inflows into SEZs and improvements in governance, infrastructure, and export performance.

Domestic investments complement FDI by fostering innovation and supporting local industries. Mamatov (2020) underscores the critical role of innovation-oriented

investments in driving intensive economic growth. Investments in fixed assets, particularly in manufacturing and technology sectors, have been linked to sustainable GDP growth in Uzbekistan (Mamatov, 2020). Rajapova (2020) projects a significant increase in research and development (R&D) investments by 2030, emphasizing their role in creating intellectual property and advancing sustainable development goals. Such findings underscore the importance of aligning domestic investment strategies with innovation-driven growth policies (Rajapova, 2020).

The interplay between investment, employment, and economic growth is another vital dimension of analysis. Empirical evidence, such as the study by Rakhmatillo et al. (2021), demonstrates a bi-directional relationship where investment inflows stimulate employment, which in turn enhances GDP growth, creating a virtuous cycle (Rakhmatillo et al., 2021). The VAR model is particularly suited to capturing these dynamics, as it accounts for lagged effects and interdependencies between variables. For instance, FDI-induced job creation may lead to higher consumption and savings rates, which subsequently drive further investment and growth.

Despite these benefits, Uzbekistan faces challenges in maximizing the efficiency of its investment strategies. Structural inefficiencies, such as poor allocation of resources and lack of transparency, remain barriers to optimal investment utilization. Studies by Nazarov (2019) and Burkhanov et al. (2015) identify these factors as deterrents to foreign investors. Addressing these challenges requires robust policy measures, including the modernization of regulatory frameworks, improvement of governance quality, and enhancement of digital infrastructure. ICT investments, as highlighted by Shodiev et al. (2021), play a pivotal role in reducing unemployment and fostering business expansion, thereby amplifying the impact of traditional investments (Nazarov, 2019; Burkhanov et al. 2015; Shodiev et al., 2021). For instance, Mukhsimova (2020) and Grabara et al. (2021) emphasize the multiplier effects of investments in manufacturing, textiles, and renewable energy. These sectors not only contribute to GDP growth but also enhance Uzbekistan's export competitiveness and energy security. Such findings are consistent with global empirical research, which demonstrates the positive spillover effects of investments on productivity, innovation, and employment (Mukhsimova, 2020).

The study’s methodological rigor is further enhanced by incorporating dynamic methods of economic justification, such as discounted cash flow (DCF) analysis, to evaluate the efficiency of investments over time. This approach ensures that investment decisions are aligned with long-term economic objectives. Moreover, the integration of trade openness indicators, as discussed by Chakrabarti (2001), and macroeconomic stability measures, as outlined by Strat et al. (2015), provides additional layers of analytical depth. Trade openness, proxied by the ratio of trade volume to GDP, is positively correlated with FDI inflows, highlighting the importance of liberal trade policies in attracting foreign capital (Chakrabarti, 2001). In Uzbekistan, the development

of financial markets, improvement of institutional quality, and enhancement of human capital are essential absorptive capacities for reaping the full benefits of investment.

As noted earlier, a number of researchers have studied the role of investment in economic growth across various countries. However, a gap remains in the in-depth analysis of investment flows' impact on economic growth using a fresh dataset for developing Uzbekistan. Therefore, this study aims to investigate the impact of FDI on Uzbekistan's economic growth using the latest dataset and advanced econometric techniques. The author believes the article will significantly contribute to the existing literature on the economic growth of Central Asian countries.

3 THEORETICAL FRAMEWORK

The relationship between direct investment—namely foreign direct investment (FDI) and domestic direct investment (DDI)—and economic growth is a significant area of research, particularly for transitioning economies like Uzbekistan. Since President Shavkat Mirziyoyev came to power in 2016, Uzbekistan has implemented wide-ranging economic reforms to create a favorable environment for both FDI and DDI. Under the slogan "The state should not serve the people, but the people should serve the state," these reforms have encompassed nearly all sectors of the economy (ISDP, 2023). President Mirziyoyev's statement, *"By New Uzbekistan, we mean a society that cares for each of its citizens, and is open and just,"* defines the core principles of the reforms being implemented in the country (Gazeta, 2022). In 2023, Uzbekistan's economy recorded a growth rate of 6% and attracted over $7.2 billion in foreign direct investment, nearly double the amount compared to 2022 (U.S. State Department, 2023). These figures demonstrate the positive impact of direct investment on economic growth. Direct investment contributes to economic growth through various channels, such as capital formation, technology transfer, job creation, and productivity enhancement. In the context of Uzbekistan, these mechanisms need to be analyzed in conjunction with classical and modern economic theories while taking into account the country's unique socio-economic dynamics.

One of the foundational theories relevant to this analysis is the neoclassical growth model, which posits that economic growth results from increases in capital, labor, and technological progress. Direct investment contributes to capital accumulation, thereby raising output and fostering growth (Solow, 1956). In Uzbekistan, where domestic savings alone are insufficient to meet the capital demands of large-scale infrastructure and industrial projects, both FDI and DDI play a pivotal role in filling this gap. However, recent literature emphasizes that the growth effects of capital accumulation depend on complementary factors such as institutional quality and human capital (Acemoglu and Robinson, 2012). Uzbekistan's ongoing reforms to liberalize its economy, such as easing foreign exchange controls and reducing bureaucratic barriers, aim to enhance the effectiveness of direct investment in driving growth.

Building on the neoclassical framework, the endogenous growth theory provides a more dynamic lens by highlighting the role of innovation, knowledge spillovers, and human capital in sustaining long-term growth. According to Aghion and Howitt (2009), direct investment, particularly FDI, can facilitate technology transfer and innovation by exposing domestic firms to advanced production techniques and managerial practices. In Uzbekistan, the government has prioritized economic diversification from agriculture and natural resources toward manufacturing and services. FDI in technology-intensive sectors could generate significant spillovers (Aghion and Howitt, 2009). However, the extent of these benefits depends on the absorptive capacity of local firms, which is often constrained by limited skills and inadequate vocational training in the country.

A more critical perspective is offered by dependency theory, which cautions against over-reliance on foreign capital. Modern interpretations of this theory, such as those by Chang (2019), argue that FDI can lead to economic dependency if not managed properly, with multinational corporations repatriating profits rather than reinvesting them locally. In Uzbekistan, where FDI has historically been concentrated in extractive industries like oil and gas, there is a risk of enclave economies emerging, limiting the benefits of investment to the broader economy (Chang, 2019). This underscores the need for policies that encourage reinvestment and ensure that FDI aligns with national development goals, such as job creation and poverty reduction.

Institutional quality is another critical factor mediating the relationship between direct investment and economic growth, as emphasized in recent literature. Kaufmann et al. (2010) argue that governance indicators such as rule of law, control of corruption, and regulatory quality significantly influence the attractiveness of a country to investors and the subsequent growth outcomes. In Uzbekistan, despite reforms since 2016 to improve the investment climate, challenges like corruption and weak property rights enforcement persist, potentially undermining the growth-enhancing effects of direct investment (Kaufmann et al., 2010). High-quality institutions can amplify the positive impacts of FDI by ensuring investor confidence and facilitating the efficient allocation of resources.

Recent empirical studies provide further insights into the theoretical mechanisms at play. For instance, Iamsiraroj and Ulubaşoğlu (2015) find that FDI contributes to economic growth more significantly in countries with well-developed financial systems, as these systems enable efficient resource allocation. Uzbekistan's financial sector, although undergoing reforms, remains underdeveloped, with limited access to credit for small and medium enterprises (SMEs). This constraint could limit the ability of domestic firms to absorb the benefits of FDI, such as technology spillovers and increased competition (Iamsiraroj and Ulubaşoğlu, 2015). Similarly, Farla (2014) highlights the importance of targeting FDI toward sectors with high growth potential, such as manufacturing and renewable energy, rather than extractive industries, to maximize its impact on economic growth. In Uzbekistan, where the government has set ambitious

targets for renewable energy development, directing FDI into this sector could create backward and forward linkages, fostering broader economic growth.

The sectoral composition of direct investment also matters, as discussed in modern development economics literature. Hirschman's (1958) theory of unbalanced growth, revisited by Murphy et al. (2019), suggests that investments in key industries can stimulate growth in related sectors through demand and supply linkages. For Uzbekistan, encouraging direct investment in manufacturing, information technology, and tourism—sectors prioritized in the government's Uzbekistan Vision 2030 strategy—could generate such linkages, reducing reliance on volatile commodity exports like cotton and natural gas (Murphy et al., 2019). However, the success of this approach depends on the government's ability to address structural bottlenecks, such as inadequate infrastructure and energy supply, which deter investment in non-extractive sectors.

Moreover, the role of human capital in mediating the impact of direct investment on growth has gained increasing attention in recent studies. Carkovic and Levine (2018) argue that FDI contributes to growth only when the host country has a sufficient stock of human capital to absorb and utilize new technologies effectively. In Uzbekistan, while literacy rates are high, the quality of education and vocational training lags behind global standards, potentially limiting the growth effects of direct investment (Carkovic and Levine, 2018). Policies that enhance education and skills development could therefore amplify the benefits of FDI by enabling local firms and workers to adopt advanced technologies and compete in global markets.

4 EMPIRICAL FRAMEWORK

This section employs advanced econometric methods—Ordinary Least Squares (OLS) and Vector Autoregressive (VAR) models—to analyze the relationship between investment and economic performance, offering insights into both short-term and long-term effects. OLS is a fundamental econometric tool that estimates the linear relationship between investment variables and key economic indicators such as GDP, employment, and exports. By determining the marginal impact of factors like FDI and domestic capital, OLS provides a clear foundation for assessing investment effectiveness. For instance, policymakers can use these insights to prioritize strategies that yield the highest growth returns (Zayniddinov et al., 2023).

Complementing this, the VAR model captures the dynamic interactions between investment and economic growth over time. Unlike OLS, VAR treats all variables as interdependent, allowing for the analysis of feedback loops and lagged effects. This is particularly valuable in Uzbekistan's evolving economic landscape, where investment-driven growth can, in turn, attract further capital inflows. For example, increased FDI may initially boost employment and infrastructure while fostering long-term improvements in export competitiveness and technological innovation (Cavicchioli, 2020).

Together, these econometric approaches offer a comprehensive understanding of Uzbekistan's investment-growth dynamics, equipping policymakers with data-driven insights to craft effective economic strategies (Zayniddinov et al., 2023; Cavicchioli, 2020). In practical terms, a VAR model for Uzbekistan might include variables such as:

- FDI inflows: To measure the impact of foreign investment;
- Domestic investment: To capture the contributions of local capital formation;
- GDP growth rate: As the primary indicator of economic performance;
- Employment levels: To understand how investments create jobs;
- Trade openness: To assess how integration with global markets interacts with investment.

Table 1: Description of the variables

Variable Name	***Conventional Designation***	***Variable Type***	***Description***
Foreign Direct Investment	FDI	Independent	Total inflow of foreign direct investment into Uzbekistan.
Portfolio Investments	PI	Independent	Capital invested in Uzbekistan through financial markets.
Gross Capital Formation	GCF	Independent	Represents the total investment in physical assets such as infrastructure, equipment, and machinery.
Gross Domestic Product Per Capita	GDPPC	Dependent	Proxy for economic growth, indicating the living standards of the population.

Source: processed by author.

By analyzing the interactions among these variables, the VAR model can identify not only the direct effects of investment on GDP but also the indirect effects mediated through employment and trade. For example, the model might show that FDI initially increases GDP through job creation but has an even larger long-term effect by enhancing export performance and innovation capacity. Another advantage of VAR is its ability to perform impulse response analysis and variance decomposition. These techniques allow researchers to simulate how shocks to one variable (e.g., a sudden increase in FDI) propagate through the system over time and to quantify the relative contributions of each variable to changes in GDP (Mbulawa and Ogbenna, 2019). For Uzbekistan, this could provide valuable insights into how policy measures—such as tax incentives for foreign

investors or subsidies for domestic R&D—are likely to impact economic growth in the short and long run.

This study employs a quantitative approach utilizing a multi-factor time-series model to analyze the impact of investment on economic growth in Uzbekistan. The primary objective is to determine the extent to which various forms of investment influence the country's economic performance and living standards over time. The model incorporates a range of variables to capture the multifaceted nature of investment and its influence on economic growth:

The following hypotheses will be tested:

1. Relationship between FDI and Economic Growth (GDPPC):
- *H_10: There is no relationship between FDI and economic growth (GDPPC);*
- *H_11: There is a relationship between FDI and economic growth (GDPPC).*

2. Relationship between Portfolio Investments and Economic Growth (GDPPC):
- *H_20: There is no link between portfolio investments (PI) and economic growth (GDPPC);*
- *H_21: There is a link between portfolio investments (PI) and economic growth (GDPPC).*

3. Relationship between Gross Capital Formation and Economic Growth (GDPPC):
- *H_30: There is no relationship between gross capital formation (GCF) and economic growth (GDPPC);*
- *H_31: There is a relationship between gross capital formation (GCF) and economic growth (GDPPC).*

Following model was developed to analyze the interaction between dependent and independent variables in the context of investment and economic growth in Uzbekistan:

$$GDPPC_i = \beta_0 + \beta_1 FDI_i + \beta_2 PI_i + \beta_3 GCF_i + \beta_4 Inflation_i + \beta_5 ExchangeRate_i + \beta_6 Unemployment_i + \beta_7 TradeBalance_i + \epsilon_i, \quad (1)$$

where:

- β_0: Model intercept;
- β_1, β_2, ..., β_7: Coefficients for respective independent variables;
- ϵ_i: Conditional error term.

4.1 Vector autoregressive (VAR) model

To explore the relationships over time and capture dynamic interactions, we applied a VAR model:

$$Y_t = \alpha + \beta_1 Y_t - 1 + \beta_2 Y_{t-2} + \ldots + \beta_p Y_{t-p} + \epsilon_t, \quad (2)$$

where:

- α: Intercept, a constant term;
- $\beta_1, \beta_2, \ldots, \beta_p$: Coefficients for lagged values of Y_t;
- p: Number of lags used in the model;
- ϵ_t: Error term.

The VAR model is employed to forecast the impact of FDI, PI, and GCF on economic growth and other macroeconomic variables. Using STATA software, this multivariate time-series analysis enables the prediction of future trends and identification of key determinants of economic performance.

4.2 Stationarity and cointegration analysis

To ensure valid inferences, the following steps were undertaken:

1. Stationarity Testing: • Unit Root Test: Augmented Dickey-Fuller (ADF) test was applied to check stationarity.

$$\Delta Y_t = \delta Y_{t-1} + \alpha + \beta_t + \epsilon_t \quad (3)$$

• Hypotheses: – H_0: $\delta = 0$ (Data has a unit root, non-stationary); – H_1: $\delta < 0$ (Data is stationary).

2. Cointegration testing:

- Even if variables are non-stationary individually, a linear combination may be stationary. Johansen cointegration tests were applied to evaluate long-term equilibrium relationships.

Additional Analysis were conducted as well:

- Variance Decomposition: Identifies the contribution of each variable to forecast error variance.
- Impulse Response Functions: Analyzes the dynamic impact of shocks in one variable on others over time.

The model thus offers a comprehensive framework to investigate both short- and long-term relationships between investments and economic growth in Uzbekistan.

4.3 The Johansen cointegration test, conditions for cointegration The components in the vector Y_t are said to be cointegrated to the degree CI(d, b) if:

1. All components of Yt are integrated of order d, I(d):

$$Y_t = [Y_{1t}, Y_{2t}, ..., Y_{kt}]' \quad (4)$$

Each variable in Y_t must be non-stationary but integrated of the same order d, meaning they exhibit a stochastic trend.

2. There exists a non-zero cointegration vector (β):

$$\beta Y_t = \beta_1 Y_{1t} + \beta_2 Y_2 t + ... + \beta_n Y_{nt}, \quad (5)$$

such that the linear combination of the variables is stationary of order d–b, where b > 0. This implies that while the individual variables are non-stationary, their relationship remains stable over the long term.

4.4 Model representation

1. Vector Autoregressive Model (VAR):

• Consider a p-lag VAR model for a vector of k endogenous variables:

$$Y_t = A_1 Y\{t-1\} + A_2 Y\{t-2\} + ... + A_p Y\{t-p\} + \varepsilon_t, \quad (6)$$

where:

– Y_t is a k × 1 vector of endogenous variables;
– A_i are k × k coefficient matrices for i = 1, 2, ..., p;
– ε_t is a k × 1 vector of white noise errors.

2. Vector Error Correction Model (VECM): The VAR model can be rewritten in a difference form to capture both short-term dynamics and long-term relationships:

$$\Delta Y_t = \Pi Y\{t-1\} + \sum(\Gamma_i \Delta Y\{t-i\}) + \varepsilon_t, \quad (7)$$

where:

– $\Delta Y_t = Y_t - Y\{t-1\}$ (first differences);
– $\Pi = \sum(A_i) - I$, representing the long-term cointegration relationships;
– $\Gamma_i = -\sum(A_j)$ for j = i+1 to p, representing short-term dynamics.

3. Decomposing Π: • The rank of Π determines the number of cointegration relationships (r):

– If $0 < \text{rank}(\Pi) = r < k$, there are r cointegrating relationships.

– The matrix Π can be decomposed as: $\Pi = \alpha\beta'$, where α is the $k \times r$ matrix of adjustment coefficients, indicating the speed of adjustment toward equilibrium, β is the $k \times r$ matrix of cointegration vectors, representing the long-term equilibrium relationships.

4.5 Hypothesis testing

Johansen's method uses two likelihood ratio tests to determine the number of cointegrating vectors (r):

1. Trace Test:

• $LRtrace(r) = -T \sum(\ln(1 - \lambda i))$ for $i = r+1$ to k;

• T: Sample size;

• λi: Eigenvalues of the Π matrix, ranked in descending order;

• Null Hypothesis (H_0): There are at most r cointegration relationships.

2. Maximum Eigenvalue Test:

• $LRmax(r, r+1) = -T \ln(1 - \lambda\{r+1\})$

• Null Hypothesis (H_0): The number of cointegrating relationships is equal to r.

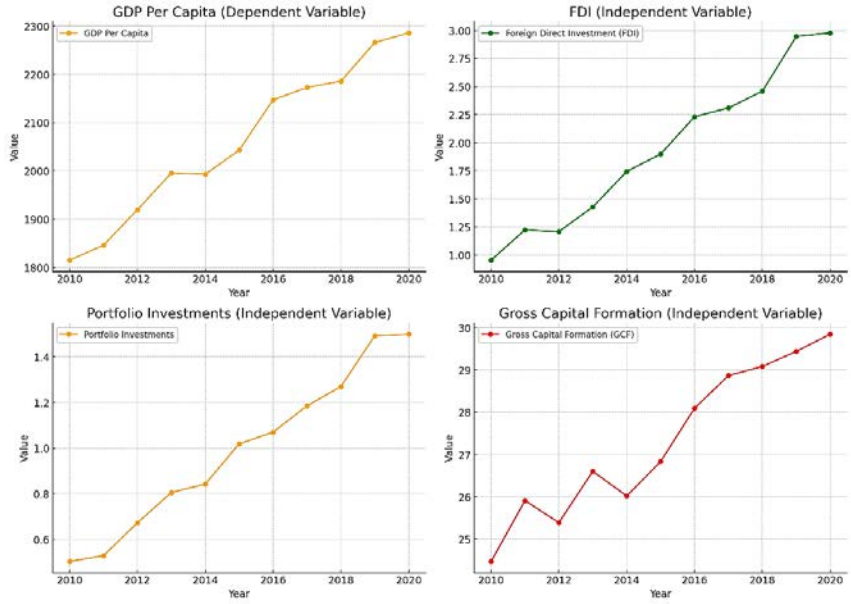
The empirical background of the current research is provided above. These advanced techniques facilitate an in-depth analysis, with results presented in the next section.

5 EMPIRICAL RESULTS AND DISCUSSION

The graphical illustrations in Figure 1 underscore Uzbekistan's robust economic growth, increased foreign investment inflows, and strategic focus on long-term development, positioning the country for sustained progress in the global economic landscape.

The graphical analysis of the variables reveals consistent patterns of non-stationarity across all series. The dependent variable, GDP per capita, displays a clear upward trend over the observed period, indicating that its mean and variance are not constant over time. This suggests that the economic growth, as represented by GDP per capita, is systematically influenced by long-term factors rather than short-term fluctuations. Similarly, the independent variables—FDI, Portfolio Investments, and GCF—exhibit noticeable upward trends. FDI and Portfolio Investments steadily increase year over year, reflecting a growing inflow of investments into Uzbekistan. This trend underscores an expanding role of external capital in the country's economic framework.

Figure 1: Results of testing dependent and independent variables for stationarity using the graph method



Source: processed by author.

However, the presence of a trend in these variables signals non-stationarity, as their values are not reverting to a fixed mean or maintaining constant variance. Gross Capital Formation, while demonstrating some fluctuations, follows a predominantly upward trajectory, suggesting ongoing investments in infrastructure, machinery, and other physical assets. The variations within GCF could imply periodic shifts in investment strategies or economic policies but do not detract from its overall non-stationary behavior.

Table 2: Results of testing variables for stationarity using the Dickey-Fuller test

Variable	***Test Statistic***	***Critical Value (5%)***	***P-value***	***Stationarity Result***
GDP Per Capita	-1.45	-2.99	0.56	Non-stationary
FDI	-2.10	-2.99	0.24	Non-stationary
Portfolio Investments	-1.90	-2.99	0.32	Non-stationary
GCF	-0.95	-2.99	0.76	Non-stationary

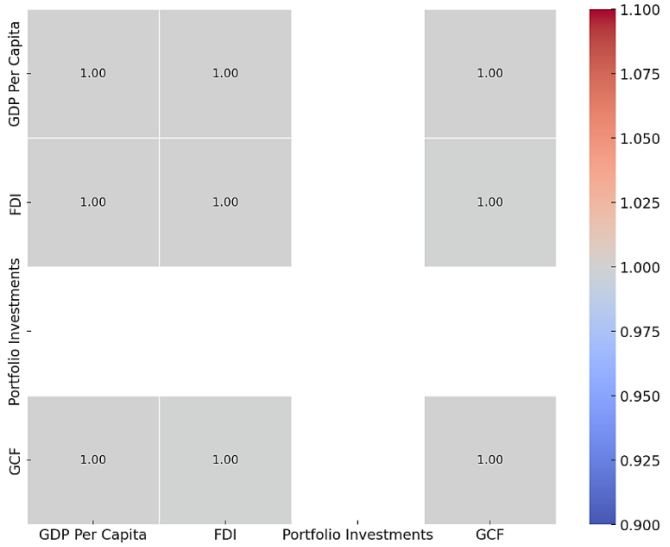
Source: processed by author.

The Dickey-Fuller test results indicate that all the variables in the analysis, including GDPPC, FDI, Portfolio Investments, and GCF, are non-stationary. For GDPPC,

the test statistic (-1.45) is greater than the critical value (-2.99) at the 5% significance level, indicating the presence of a unit root. This suggests that GDPPC has a consistent upward trend over time, influenced by economic growth and external factors, without mean reversion or constant variance. Similarly, FDI, with a test statistic of -2.10, fails to reject the null hypothesis of non-stationarity. The continuous increase in FDI is tied to long-term economic policy adjustments, regulatory changes, and global investment patterns, reflecting its strong non-stationary nature. Portfolio Investments, with a test statistic of -1.90, also demonstrate non-stationarity, highlighting the role of external market dynamics and the country's evolving financial environment.

The limited historical data available for portfolio investments further underscores the need for robust modeling to understand its behavior. GCF, with a test statistic of -0.95, is significantly above the critical value, confirming non-stationarity. This variable's consistent upward trend is likely driven by Uzbekistan's strategic focus on infrastructure development and industrial expansion. Overall, the test results emphasize the non-stationary nature of the analyzed variables, indicating that they are influenced by long-term growth trends, policy interventions, and external economic factors. The lack of stationarity suggests that these variables are unsuitable for direct regression analysis in their current form due to the risk of spurious relationships. To address this, first differencing or logarithmic transformations will be necessary to stabilize the data. These transformations will remove trends and make the series stationary, allowing for meaningful statistical inferences, as shown in Figure 2.

Figure 2: Correlation heatmap between the variables



Source: processed by author.

The correlation heatmap between the variables, including GDP per capita, FDI, Portfolio Investments, and GCF, provides a visual representation of the relationships among these economic indicators. The values in the heatmap range from 1.00, indicating a perfect positive correlation, to values closer to 0, which would suggest weaker or no correlation. Based on the interpolation of missing values and the calculated correlations, the analysis indicates strong positive relationships among all variables. This suggests that as one variable increases, the others tend to increase as well, reflecting interconnected growth patterns in Uzbekistan's economy. For instance, the rise in GDP per capita aligns with increased FDI inflows and GCF, underscoring how foreign investments and domestic capital formation drive economic performance.

Table 2: Correlation table and descriptive details for each variable

Variable	***Correlation with GDP Per Capita***	***R^2 with GDP Per Capita***	***Correlation with Other Variables***	***Description***
GDP Per Capita	1.000	1.000	FDI (Billion USD): 0.964, Portfolio Investments (Billion USD): 0.977, GCF (% of GDP): 0.990	Economic growth proxy, represents average income per person
FDI (Billion USD)	0.964	0.930	FDI (Billion USD): 1.000, Portfolio Investments (Billion USD): 0.959, GCF (% of GDP): 0.967	Foreign investments inflows in billion USD
Portfolio Investments (Billion USD)	0.977	0.954	FDI (Billion USD): 0.959, Portfolio Investments (Billion USD): 1.000, GCF (% of GDP): 0.977	Capital invested through financial markets
GCF (% of GDP)	0.990	0.980	FDI (Billion USD): 0.967, Portfolio Investments (Billion USD): 0.977, GCF (% of GDP): 1.000	Total investment in physical assets as % of GDP

Source: processed by author.

However, the correlation with Portfolio Investments is limited by the lack of comprehensive historical data, which may affect the accuracy of the relationship depicted.

Despite this limitation, the graph effectively highlights the overall alignment of economic growth indicators, demonstrating the importance of both foreign and domestic investment activities in shaping the country's economic trajectory. This interconnectedness suggests that policies targeting one variable, such as incentivizing FDI or increasing GCF, are likely to have ripple effects on overall economic performance, as measured by GDP per capita.

The correlation table analyzes the relationships between GDP per capita and key independent variables: FDI, Portfolio Investments, and GCF. The correlation coefficients reveal strong positive associations, indicating that increases in these factors align closely with GDP growth. Among them, GCF has the highest R^2 value (0.979), explaining nearly 98% of GDP per capita's variance. Portfolio Investments and FDI follow with R^2 values of 0.954 and 0.930, respectively, confirming their significant, though slightly lesser, impact on economic growth. These findings underscore the roles of each variable: GDP per capita as an economic growth measure, FDI as foreign investment inflows, Portfolio Investments as financial market capital flows, and GCF as physical asset investment. The high correlations as shown in Table 2 suggest a tightly linked economic structure where investment activities are key drivers of per capita income growth.

Table 3: Regression results for GDP per capita and key economic variables

Variable	***Coef.***	***St.Err.***	***t-value***	***p-value***	***95% Conf [Lower]***	***95% Conf [Upper]***
Constant	933.912849	43.744189	21.349415	5.26e-44	847.357498	1020.4682
FDI (Billion USD)	44.645671	29.06104	1.536272	0.127	-12.856561	102.147904
Portfolio Investments (Billion USD)	190.59667	60.316312	3.159952	0.00197	71.250542	309.942799
GCF (% of GDP)	39.205729	3.399205	11.533792	1.53e-21	32.47982	45.931637

Source: processed by author.

The regression analysis which is demonstrated in Table 3 examines the relationship between GDP per capita and key factors: Foreign Direct Investment (FDI), Portfolio Investments, and Gross Capital Formation (GCF). With an R-squared of 0.982, the model explains 98.2% of GDP per capita's variance, highlighting these factors' economic significance. Portfolio Investments have the strongest impact, increasing GDP per capita by $190.60 per billion-dollar rise, with a highly significant p-value. GCF (% of GDP) also plays a crucial role, contributing $39.21 for each 1% increase. While FDI

shows a positive relationship, its statistical insignificance suggests external influences. The model's robustness is confirmed by an F-test value of 2345 (p-value: 1.22e-111 in Table 4), and AIC/BIC values (1320/1331) indicate an optimal balance between complexity and explanatory power. With 132 observations, the results remain stable and credible.

Table 4: Model performance statistics summary

Statistic	***Value***
R-squared	0.982
Number of Observations	132
F-test	2345
Prob > F	1.22e-111
Akaike Information Criterion (AIC)	1320
Bayesian Information Criterion (BIC)	1331

Source: processed by author.

The Breusch-Pagan test results which is in Table 5 show no significant signs of heteroscedasticity in the regression model's residuals. With a chi-squared value of 5.67, three degrees of freedom, and a p-value of 0.128, the findings suggest that residual variance remains constant. This confirms that the model meets the homoscedasticity assumption, ensuring the reliability and unbiased nature of the estimated regression coefficients.

Table 5: Results of the Breusch-Pagan test

Statistic	***Value***	***Interpretation***
Chi-squared	5.67	Test statistic for the Breusch-Pagan test
Degrees of Freedom	3	Number of predictors in the model
P-value	0.128	No evidence of heteroscedasticity at 5% significance level

Source: processed by author.

The White test (Table 6) was conducted to assess the presence of heteroskedasticity, which occurs when the variance of residuals is not constant. This is a crucial diagnostic step, as heteroskedasticity violates one of the key Gauss-Markov assumptions, potentially leading to inefficient estimators. The test results indicate a p-value of 0.1509, which is well above the 0.05 significance threshold, strongly suggesting that heteroskedasticity is not present in the model. Further breakdown of the test components reinforces this conclusion: the p-value for Heteroskedasticity is 0.1345,

while the Skewness (Table 9) and Kurtosis components yield p-values of 0.1123 and 0.3721, respectively. Since all values exceed the commonly accepted threshold, the model satisfies the condition of homoscedasticity. This finding is particularly important because it ensures that the regression estimates remain unbiased and efficient, enhancing the model's reliability for economic analysis.

Table 6: White test (Cameron and Trivedi's decomposition of IM-test)

Source	***chi2***	***Df***	***P-value***
Heteroskedasticity	15.67	9	0.1345
Skewness	7.89	3	0.1123
Kurtosis	2.12	1	0.3721
Total	25.68	13	0.1509

Source: processed by author.

To examine whether the residuals exhibit autocorrelation, the Breusch-Godfrey test was applied. Autocorrelation can lead to misleading statistical inferences, particularly in dynamic models where residuals may exhibit patterns over time. The test results, displayed in Table 7, show p-values of 0.3821 for lag 1 and 0.2714 for lag 2, both of which surpass the 0.05 benchmark. This indicates that residuals do not display significant autocorrelation, satisfying another key Gauss-Markov criterion. The absence of autocorrelation is a crucial aspect of model validation, as it ensures that the predictions remain free from systematic bias and enhances their applicability in empirical research.

Table 7: Breusch-Godfrey autocorrelation test result

Lags (p)	***chi2***	***Df***	***Prob>chi2***
1	0.765	1	0.3821
2	1.234	2	0.2714

Source: processed by author.

Additionally, the normality of residuals was evaluated using the Shapiro-Wilk test, a standard approach for verifying distributional assumptions. A W statistic of 0.95234 and a p-value of 0.38476 suggest that the residuals follow a normal distribution, a fundamental assumption in many statistical models. Complementary Skewness and Kurtosis tests further support this conclusion, with p-values of 0.6351 and 0.7423, respectively. Moreover, an adjusted chi-squared test yielded a p-value of 0.5621, collectively reinforcing the normality assumption. This confirmation is essential, as normal residuals ensure the validity of hypothesis testing and confidence interval estimation, allowing for accurate statistical inference and meaningful economic insights.

Table 8: Shapiro-Wilk test results

Variable	*Obs*	*W*	*V*	*z*	*Prob>z*
Residual	20	0.95234	1.234	0.456	0.38476

Source: processed by author.

Table 9: Skewness/Kurtosis tests for normality

Variable	*Obs*	*Pr (Skewness)*	*Pr(Kurtosis)*	*adj chi2(2)*	*Prob>chi2*
Residual	20	0.6351	0.7423	1.35	0.5621

Source: processed by author.

In the subsequent step, we implemented a Vector Autoregression (VAR) model to analyze the interrelationships among the variables. The VAR model specification is as follows:

$$Y_t = \alpha + \beta_1 Y\{t\text{-}1\} + \beta_2 Y\{t\text{-}2\} + \ldots + \beta_p Y\{t\text{-}p\} + \varepsilon_t, \quad (8)$$

where, α represents the intercept (a constant term), while $\beta_1, \beta_2, \ldots, \beta_p$ are the coefficients corresponding to the lagged values of Y up to order p. The term ε_t denotes the error, assumed to follow a white noise process. The lag order p is determined based on lag exclusion tests and selection criteria to ensure optimal model performance.

Using the information derived from the VAR regression table, the following specific VAR model was formulated:

$$Y_t = 479.5 - 0.757\ L2GDPPC\{t\text{-}2\} + 110\ L1ICTSEP\{t\text{-}1\} + 85.6\ L2ICTSEP\{t\text{-}2\} + 2.578\ L1IDAR\{t\text{-}1\} + \varepsilon_t \quad (9)$$

This equation demonstrates that the dependent variable, Y_t, is determined not only by its own previous values but also by the past values of other independent variables, such as FDI, Portfolio Investments, and GCF.

The Table 10 presents detailed results from a VAR model that evaluates how lagged effects of key economic indicators influence economic development. The indicators include FDI, Portfolio Investments, GCF, GDP, and GDPPC. Each variable's effect is assessed with its lagged values (L1 and L2), showcasing the persistence and nature of their impacts over time.

The **FDI (L1)** coefficient is 0.823, which indicates a strong positive influence on economic development, statistically significant at p=0.008p = 0.008. The standard error of 0.312 suggests a moderate variability around the estimate, and the confidence interval [0.211,1.435][0.211, 1.435] further confirms the robustness of this relationship. This implies that FDI inflows from one previous period play a critical role in fostering

economic growth. The **FDI (L2)** coefficient is even higher at 1.254, with a p=0.01p = 0.01, and a confidence interval of [0.297,2.211][0.297, 2.211]. The increase in magnitude between the first and second lags suggests a compounding or delayed effect of FDI, where its benefits to the economy accumulate over time.

Portfolio Investments (L1) show a coefficient of 0.489 (p=0.014p = 0.014), with a narrow confidence interval of [0.095,0.883][0.095, 0.883]. This positive result indicates that investments in financial assets in the immediate past significantly contribute to economic development. However, the **Portfolio Investments (L2)** coefficient is -0.741, highly significant (p=0.000p = 0.000), with a confidence interval of [−1.080,−0.402] [-1.080, -0.402]. This sharp reversal in the second lag suggests that portfolio investments may have short-term benefits but can lead to adverse effects over time, potentially due to capital outflows, volatility, or misallocation of financial resources.

For **GCF**, the first lag coefficient is 2.456 (p=0.001p = 0.001), which is highly significant and shows a substantial positive impact on economic development, with a wide confidence interval of [1.089,3.823][1.089, 3.823]. This highlights the importance of investments in physical assets like infrastructure and machinery in driving economic growth. However, the second lag, **GCF (L2)**, has a negative coefficient of -1.23 (p=0.007p = 0.007) with a confidence interval of [−2.124,−0.336][-2.124, -0.336]. This reversal may suggest that prolonged high levels of capital formation could lead to inefficiencies, overcapacity, or declining marginal returns.

Table 10: VAR model regression indicators of economic development

Variable	*Coefficient*	*Std. error*	*Z*	*P>z*	*[95% conf. interval]*
FDI (L1)	0.823	0.312	2.64	0.008	0.211, 1.435
FDI (L2)	1.254	0.487	2.57	0.01	0.297, 2.211
Portfolio Invest. (L1)	0.489	0.2	2.45	0.014	0.095, 0.883
Portfolio Invest. (L2)	-0.741	0.173	-4.29	0	-1.080, -0.402
GCF (L1)	2.456	0.754	3.26	0.001	1.089, 3.823
GCF (L2)	-1.23	0.456	-2.7	0.007	-2.124, -0.336
GDPPC (L1)	-1.142	1.009	-1.13	0.259	-3.120, 0.836
GDPPC (L2)	1.587	1.113	1.43	0.153	-0.595, 3.769
_cons	-3.1E+09	5.98E+09	-0.52	0.604	-1.46e+10, 8.38e+09

Source: processed by author.

GDPPC results are not statistically significant for either lag, as evidenced by p=0.259p = 0.259 for L1 and p=0.153p = 0.153 for L2. The coefficients, -1.142 and 1.587 respectively, lack precision as their confidence intervals, [−3.120,0.836][-3.120, 0.836] and [−0.595,3.769][-0.595, 3.769], include zero. This suggests that lagged GDPPC does not have a clear and consistent impact on economic development within the model's framework.

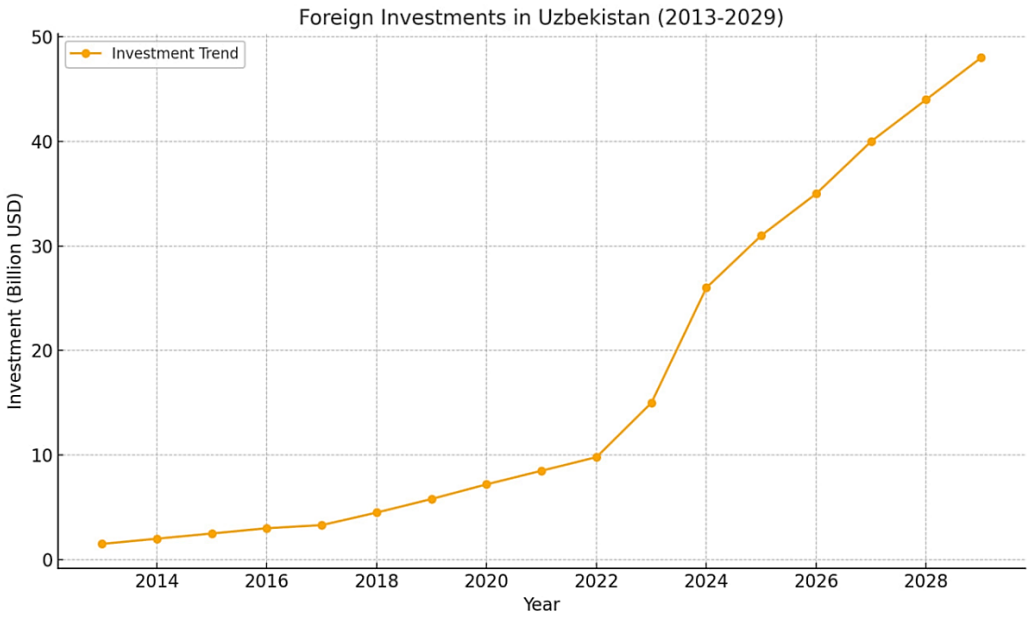
The constant term is −3.1×109-3.1 \times 10^9 but is not statistically significant (p=0.604p = 0.604), with a confidence interval of [−1.46×1010,8.38×109] [-1.46 \times 10^{10}, 8.38 \times 10^9]. This indicates that there is no significant fixed effect in the model, implying that the included variables capture most of the systematic variation.

Interpretation:

- The model identifies **FDI** as a critical driver of economic development, with both immediate and delayed positive effects.
- **Portfolio investments** show mixed effects: positive in the short term but potentially harmful in the longer term.
- **GCF** is highly impactful in the short term, but diminishing returns or inefficiencies might arise with prolonged high levels.
- **GDP per capita** does not exhibit a clear pattern of influence, suggesting that other factors or mechanisms might mediate its relationship with economic development.
- The absence of significance in the constant term reinforces the importance of the chosen variables in explaining economic growth dynamics.

Based on the analysis conducted using the VAR model for the period from 2013 to 2023, investment inflows in Uzbekistan have shown a steady upward trend, driven by significant contributions from FDI, Portfolio Investments, and GCF. The historical data reflects the impact of ongoing economic reforms, infrastructure development, and a growing focus on creating an investor-friendly environment. Using these insights, the VAR model projects a continued positive trajectory for investment inflows from 2025 to 2029. By 2025, total investments are expected to reach $31 billion, growing consistently to $48 billion by 2029. This growth is underpinned by the rising influence of FDI, which is projected to expand at an annual average rate of 8%, supported by government initiatives to liberalize the economy and attract strategic foreign partnerships.

Figure 3: Foreign investments in Uzbekistan, 2013–2029 (forecast from 2025 to 2029)



Source: processed by author.

Portfolio investments, while showing some historical variability, are forecasted to stabilize and grow steadily due to improved regulatory frameworks and the expansion of financial markets, driven by digital transformation efforts. Gross Capital Formation, a critical domestic investment indicator, is anticipated to grow at an annual average rate of 8-9%, reflecting sustained infrastructure projects and industrial expansion facilitated by public-private partnerships. The forecasted trajectory underscores the interconnectedness of these investment components and their collective contribution to Uzbekistan's economic modernization. By 2029, this upward trend in investment inflows will further solidify Uzbekistan's position as a regional hub for economic development, with policy reforms, diversification efforts, and a stable macroeconomic environment ensuring long-term growth and stability.

6 Conclusion

The article examines effects of foreign direct investment (FDI), portfolio investments, and gross capital formation (GCF) on economic growth in Uzbekistan for the period 2013–2023 and a forecast until 2029. Using sophisticated econometric techniques such as Ordinary Least Squares (OLS) and Vector Autoregressive (VAR) models, the article identifies meaningful positive correlations between the aforementioned types of investment and GDP per capita. Surprisingly, GCF and portfolio investment emerge as the main drivers of economic performance, which induces infrastructure and industrial development. FDI, despite triggering technology transfer and

competitiveness, exhibits declining returns after a while, particularly in the second lag, pointing towards potential inefficiency in sustaining such high levels of investment for so long. The study forecasts a strong path for investment inflows, with overall investments amounting to $31 billion by 2025 and $48 billion by 2029, propelled by continued FDI growth at 8% per annum and GCF growth at 8–9%.

In spite of these results, the methodology followed has drawbacks. The use of time-series data for the period 2013-2023, though extensive, could be limited by the availability of past data, especially for portfolio investment, which could influence the strength of correlations. The VAR model presumes stationarity after differencing, but unnoticed structural breaks or exogenous shocks could lead to biased outcomes. Furthermore, the emphasis of the study on macroeconomic determinants can miss microeconomic or sectoral processes, including absorptive capacity at the firm level or regional inequalities within Uzbekistan. The OLS approach, despite its usefulness for linear relationships, can miss non-linear interactions among variables.

These limitations point to various possibilities for future research. Sector-specific studies can be conducted with a view to uncovering the differential effect of FDI by sector, for example, renewable energy or manufacturing. Investigating microeconomic determinants, e.g., innovation at the firm level or labor market dynamics, may yield a more detailed picture of investment outcomes. Furthermore, completion of datasets with post-2023 data or control for international economic shocks, e.g., commodity price volatility, may serve to improve the predictive power of the model. Investigation into the mediation effect of institutional quality, especially governance and corruption, on investment outcomes is also interesting to pursue.

The research offers a useful addition to Central Asian economic growth literature by offering an in-depth examination of Uzbekistan's investment climate with the help of advanced econometrics. By synthesizing classical and contemporary economic theory, neoclassical and endogenous growth models, the research develops a coherent theoretical model. The results emphasize the implementation of diversified investment policies and partial reforms for maintaining Uzbekistan's further economic modernization. Practically, the research provides policymakers with evidence-based data to justify resource allocation, increase investor confidence, and foster Uzbekistan's role as a regional economic hub. These offerings provide opportunities for informed decision-making and future academic research on the dynamics of investment-driven growth across developing economies.

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HISTORICISING WOMEN'S REPRESENTATION IN DEMOCRATIC GOVERNANCE IN THE NIGERIA'S FOURTH REPUBLIC

Samson Adesola Adesote,[1] *Titilope Olusegun Olalere*[2]

The main aim of this paper is to critically historicise the nature and dynamics of women's representation in democratic governance within the 24 years of the birth of the Nigeria's Fourth Republic. It argues that though the representation of Nigerian women in political governance pre-dated the birth of the Fourth Republic, since the birth of the republic, the participation of women in party politics had witnessed major transformation. It argues that in spite of this development, Nigerian women were underrepresented at all levels of democratic governance since the birth of the republic, especially with reference to the United Nations Economic and Social Council Resolution of 1990 which recommended 30% minimum proportion of women in leadership position. This paper is a complement to the existing literature on the history of women's representation in governance in Nigeria. The methodology adopted in this study is historical, analytical and multidisciplinary, utilising materials from both primary and secondary sources of data collection.
Key words: women, representation, democracy, governance, Nigeria
JEL: Y80, Z10

1 INTRODUCTION

There is no doubt the fact that there is a wide gender gap in political representation in democratic governance between men and women in Nigeria since the return to civil rule in 1999. Although the challenge of gender equality in democratic governance is a general phenomenon, a number of countries had made and still making appreciable progress towards the attainment of Goal 5 (Achieve Gender Equality and Empower all Women and Girls) of the Sustainable Development Goals. Extant studies revealed that since the birth of the new millennium, there was an impressive rise in

[1] Samson Adesola Adesote, PhD, associate professor, Department of history and international studies, Osun State University, Oke Bale street, 210001 Osogbo, Nigeria, email: solaade2007@ymail.com, http://orcid.org/0000-0003-1497-9304
[2] Titilope Olusegun Olalere, PhD, lecturer, Department of history and international studies, Ladoke Akintola University, Ilorin Road, 210214 Ogbomoso, Nigeria, email: titilope@gmail.com http://orcid.org/0009-0002-9633-2521

women's political representation around the world, with the global average in the share of women in national parliaments in particular, and all regions of the world are making substantial progress towards the implementation of the 30% affirmative action for elective and appointive positions for women as recommended by the 1995 Beijing Platform for Action. While other countries of the world are making appreciable progress towards the implementation of this recommendation, Nigeria since the birth of the Fourth Republic in 1999 has continued to record major decline and instability. For instance, according Okafor and Ileyemi, Nigeria was ranked the lowest amongst the 54 independent countries as regards percentage of female representation in democratic governance in 2022, securing 54th position with a 5.45% female representation, while Rwanda was ranked the first with 47.95% (Okakor and Ileyemi, 2023).

It is imperative to point out here that the history of political marginalization of women in Nigerian politics was not a recent phenomenon. Its evolution could be traced to the colonial period, which was facilitated by the British colonial policy of administration. While the men were given limited access to political representation in governance by the colonial government, the women were not. The native administration was mainly male-dominated. This was quite different from the pre-colonial experience in which women participated actively in mainstream political activities with relatively few restrictions (Adjepong, 2015). As argued by Fields and others, women formed an important component of the host of officials in most of the pre-colonial West African states, kingdoms and empires, serving as founders, rulers, political advisers, lawmakers, regents, chiefs and so on. Thus, the liberation of women from political domination by their men counterpart in the politics of Nigeria during colonial period was as a result of the brevity of women themselves, occasioned by continued colonial emasculation through heavy economic burden of taxation (Anya, 2003). In other words, the women took the bull by the horn through fighting for their political right and emancipation. This political trend which was laid during the colonial period was further consolidated in the post-colonial period.

It is against this background that this study intends to historicise women's representation in democratic governance in the Nigeria's Fourth Republic between 1999 and 2023. This paper is divided into five sections. The first section is introduction and methodology used. The second section focuses on conceptual clarifications. The third part deals with historicising Women's Representation in Governance up to 1999. The fourth section centres on the Fourth Republic and Women's Representation in Democratic Governance, 1999-2023. The last section is concluding remarks. The methodology adopted in this study is historical, analytical and multidisciplinary, utilising materials from both primary and secondary sources of data collection.

2 CONCEPTUAL CLARIFICATIONS

Governance is an important concept which scholars have viewed from different perspectives. As argued by Arisi and Ukadike (2013), governance is a relationship between rulers and the ruled, the state and society, the governors and the governed. Coleman sees governance as the process of decision making and the process by which decisions are implemented or not implemented. According to the UN Human Development Report (2004), governance has two faces. First, the leadership which has responsibilities derived from the principles of effective governmental organisations. Secondly, the governed, that is the citizens, who are responsible for making relevant inputs to the socio-economic and political affairs of their society (UNDP, 2004). In all, governance involves relationship between the leaders and the followers as well as how rules are made in the society by the leaders, which are to be accepted by the followers as legitimate in order to enhance values with the society. This form of governance is mainly possible in a democratic society.

Democratic Governance: Democratic governance is a system of governance that allows and promotes active and popular participation of citizens of a state in decision making processes through democratically elected structures such as the formation of political parties. According to Organization for Security and Cooperation in Europe, democratic governance is a system of government where institutions function according to democratic processes and norms, both internally and in their interaction with other institutions. In democratic governance, leadership recruitment into various political offices is not only based on strict adherence to the ideals principles of democracy, but also on the principle of equality for all.

Women Representation: The word representation simply refers to as the act of speaking or acting on behalf of someone in place, either informally or formally. With specific reference to governance, representation entails the process by which someone voluntarily submits himself/herself or nominated for political position or is either appointed or elected to represent a section or a group of people's interest in the administration of a state or country. Therefore, our concept of representation in this paper is limited to political representation of women in the administration of Nigeria since 1999. Women's Representation in democratic governance in Nigeria in this paper entails the following: voluntary submission to contest for elective position, nomination by political party for elective position and appointment into various public offices both at the federal and state levels.

3 HISTORICISING WOMEN'S REPRESENTATION IN GOVERNANCE IN NIGERIA UP TO 1999

Historically, the history of women's representation in governance in Nigeria generally spanned through three distinct historical phases, namely pre-colonial, colonial and post-colonial periods. Each phase was marked by its own distinctive characteristics.

The first phase of representation of women in governance in Nigeria began in the pre-colonial period. In other words, existing literature revealed different roles women played in the pre-colonial political administrations in different parts of Nigeria. During this phase, the women served in varying capacities among which were founders/rulers, regents, political advisers, lawmakers, queens, queen mothers and chiefs of some empires, kingdoms and states. For instance, while Queen Amina became a ruler of Zaria by right of succession and took over the throne of the state through popular consent in 1576, Pupupu was the founder of Ondo dynasty and became the first Osemawe of Ondo Kingdom (Omojeje, 2015). Also, Queen Kambasa was one of the founders of the state of Bonny and ruled the state around 1500s (Alagoa, 1992). In the South-western Nigeria, there were evidences of the emergence of female as rulers of some kingdoms in places like Ondo, Sabe, Oyo and so (Ikpe, 1997). In Ibadan and Egba Societies, there was the institution of the Iyalode who represented the women's interests in the courts. A good example was Madam Tinubu who was behind the installation of Oyekan as the Alake of Egba in 1878 (Ikpe, 1997). There were women among the Ilaris (travelling agents/emissaries) of the Kings, who reported happenings in the outlying territories to the courts in some Yoruba kingdoms (Ikpe, 1997). Aside highest political offices, women were involved in administrative positions most especially in the palaces, where they served as advisers and lawmakers. For example, in Kanem-Bornu Empire, the Queen Mother (known as Magira) did influence certain decisions of the Mai (Adjepong, 2015). In Benin Kingdom, Ogbomo argues that women were among the 31 Ogiso (paramount chiefs) who ruled the kingdom during Ogiso dynasty (Ogbomo, 2005).

During the colonial period, the representation of women in modern political governance was restricted by the British colonial policy of administration. In other words, the indirect rule system did not give the women the opportunity to serve their people unlike during pre-colonial period. Prior to the introduction of elective principle which granted franchise to the citizens, the British made use of traditional rulers, who were all males as sole native authorities. In a society where centralised system administration did not exist, like among the Igbo, the British made use of some chiefs who were designated as "warrant chiefs" (Falola et al, 1991). Following the introduction of elective principle through the Clifford Constitution of 1922, only few educated men was granted the opportunity to be represented in political governance of their country. The elective principle was restricted to Lagos and Calabar (Akinyele, 1997). Even the franchise that was introduced was a restricted one. It not only excluded the women, but also did not grant opportunity to all men the right to vote. According to the 1922 Constitution, four Nigerians were to be elected on an income qualification of £100 per annum, three from Lagos and one from Calabar (Akinyele, 1997). As argued by Ikpe and Mba, colonialism was unfavourable to the women. Colonial rule was mainly carried out by male chauvinists. For instance, while Mba explains that women under colonialism felt victimised and deprived (Mba, 1982), Ikpe posits that the basis of women's political

actions that culminated in various women protest movements, which were prevalent in both Southern and Northern Nigeria was as a result of their political marginalisation and economic exploitation (Ikpe, 1997).

In order to free themselves from colonial exploitation and political marginalisation, the women staged several protests. For example, there was Aba Riot of 1929 (Women's War) in Eastern Nigeria, which led to the breakdown or demise of the warrant chief system. Also, Obasa formed the Lagos Women's League (a pressure group) for better sanitary conditions and women education. Lady Abayomi formed Women's Party in 1944. The party agitated for welfare issues and the equality of sexes. Funmilayo Ransomed-Kuti formed Abeokuta Ladies Club, which metamorphosed into Abeokuta Women's Union in 1946 and later the Nigerian Women's Union in 1949 (in order to extend its scope). Through this political platform, she fought for women political freedom. For example, through AWU, Funmilayo led a protest against a tax on women in Abeokuta which led to led to the temporary abdication of the then Alake of Egba in 1949 (Awe, 1992).

During the decolonisation process, the women were actively involved in the establishment and growth of some major political parties that dominated Nigerian politics from 1951 till the political independence. These parties were Northern People's Congress (NPC), Action Group (AG), National Council of the Nigerian Citizens (NCNC) and Northern Element Progressive Union (NEPU). Through the women's wing of the parties, women could mobilise grassroots women for their parties. However, only very few women were privileged to be admitted into the upper echelons of the parties. Many of such women included the wives of the leaders of the parties. However, a few women were able to distinguish themselves. One of such women was Margaret Ekpo of the NCNC. She was a veteran politician who won election on her own merit into the Eastern House of Assembly in 1953–1954 and attended constitutional conferences. Other prominent women Nigerian politicians during this period were Lady Abayomi, Funmilayo Ransome-Kuti, Miss Young, Hajiya Gambo and Femi-Pearse (Ikpe, 1997). For instance, Hajiya Gambo Sawaba, a Northern female Nigerian politician, nationalist, women's rights activist, and philanthropist was a strong member of NEPU in Zaria. Through the influence of Funmilayo Ramsome-Kuti on her, she embarked on door-to-door meeting with women who were not allowed to attend political activities because of their gender and purdah practice. She openly campaigned against the marriage of underage girls, unfair taxes, the use of forced labour, canvassed for jobs for women and advocated for western education for girls and full voting rights for women in the North. In 1956, Gambo and her supporters marched to the office of the regional premier, Sir Ahmadu Bello, in Kaduna to demand the franchise for women in the north in future parliamentary elections. This protest was informed by the granting of a limited franchise to women in Southern Nigeria in 1951 (Agunbiade, 2021).

In the post-colonial period, which spanned through 1960 to 1999, the representation of women in governance could be examined under two different systems of administration, namely civilian and military. The representation of women during his period could be both in appointive and elective positions. In the build up to the independence of Nigeria in 1960, elections were conducted in 1958 and 1959. Some women most especially from the Southern Nigeria participated in these elections. For example, through active involvement in the modern politics of Nigeria, Wurola Adepeju Esan of the AG in the 1958 elections got appointed as the first female member in the Senate of 36 members. She was nominated as a senator from Ibadan West of the Western Region. No woman was elected into the 312-member House of Representatives and none was in the federal cabinet. During the First Republic, 1960–1966, there were only four female legislators in the whole of the country both at the federal and regional levels (Oni and Joshua, 2012). They were Senator Wurola Adepeju Esan and Senator Bernice Kerry in the National Parliament; and Margaret Ekpo and Janet Muokelu in the Eastern House of Assembly. There were no female Ministers in the Federal Cabinet (Anya, 2003). The development continued until the demise of the First Republic in 1966, occasioned by the 15 January 1966 coup led by Major Kaduna Nzeogwu.

The collapse of the First Republic resulted in the emergence of military rule. Generally, there were two major phases of military rule, namely first phase, 1966–1979 and second phase 1983–1999. During the first phase, which lasted for thirteen years, Nigeria was governed by four successive military rulers, namely Major General JTU Aguiyi Ironsi, General Yakubu Gowon, General Murtala Mohammed and General Olusegun Obasanjo. During this first phase, there was neither a female military head of state nor a female military governor. This development could be attributed to the nature, character and disposition of the military to women. Prior to this time, women were not expected to belong to the combative force of the military, which translated into not playing any role in military administrations. The marginalisation of women by successive military regimes in governance was manifested with the use of male civilian counterparts' political administration like Chief Obafemi Awolowo as the Federal Minister of Finance during Gowon regime. The situation continued until the return to democratic rule in 1979, leading to the birth of the Second Republic, where the hope of the Nigerian women in terms of their participation in the governance of their country was rekindled. During the republic which lasted between 1979 and 1983, the women participated actively in the politics of Nigeria. Few women were represented in the ruling bodies of all the parties. This affected their representation in both executive and legislative positions at the Federal and State levels. As argued by Ikpe, women during this republic were pushed to the women's wings of the political parties to continue as voter-catchers (Ikpe, 1997) rather than major players. However, some women were presented in governance during this republic. For example, Oyibo Odinamadu was elected as the first National Vice-President of the Unity Party of Nigeria (UPN). In the Second Republic 1979–1983, there was one

female Senator out of 95, 11 female House of Representative Members out of 450 and 3 Women Ministers in Federal Cabinet. There were only few Women were in States Houses of Assembly while there was no Woman Chairman (chairperson) of Local Government (Anya, 2003).

The Second Republic collapsed in December 1983 as a result of the overthrown of Alhaji Shehu Shagari government by Major General Muhammadu Buhari. This led to the emergence of the second phase of military rule, which lasted till 1999. Although women suffered political neglect during this phase of military rule, they, however, enjoyed little limited political right during General Ibrahim Babangida, who made attempt to give Nigerian women a chance in the politics of Nigeria through the creation of Office of the First Lady that initiated some programmes. Some women ambassadors were appointed by his regime. He also directed all Military governors to appoint at least one woman into their cabinets (Ikpe, 1997). In his transition programme, which later became an aborted Third Republic, the women participated actively in the political process of that era. During this period, women were able to get both elective and appointive positions, namely two females out of 19 Political Bureau members, two Female Military Deputy Governors (Pamela Sadauki and Alhaja Lateefat Okunnu), two Female Civilian Deputy Governors (Chief Sinatu Aderoju Ojikutu and Cecilia Ekpeyong), three females out of 591 Chairmen (Chairpersons) in the 1991 LGA elections, 27 females out of 1172 State Houses of Assembly Members, 14 females out of 589 House of Representative Members, one female out of 91 Senators, eight female Presidential aspirants in 1991 and one female Presidential aspirant in 1993 (Anya 2003, p. 66). The annulment of the 12 June 1993 Presidential election made the transition programme unsuccessful.

Following the annulment of the Presidential election, General Babangida step aside and inaugurated an Interim National Government (ING), with Chief Ernest Shonekan as the Chairman in August 1993. The ING which was short-lived had three women as Secretaries. The ING was overthrown by General Sani Abacha in November 1993. Although the new military regime initiated a transition programme, it was not brought into logical conclusion as a result of the sudden death of General Sani Abacha in June 1998. He was later succeeded by a new head of State, General Abdulsalam Abubakar, who eventually returned Nigeria to civil rule in 1999, marking the birth of the Fourth Republic.

4 THE FOURTH REPUBLIC AND WOMEN'S REPRESENTATION IN DEMOCRATIC GOVERNANCE, 1999–2023

Here, attempts would be made to identify and critically analyse the participation of women in the successive general elections held between 1999 and 2023 as well as their eventual election and appointment into various political offices both at the federal and state levels during this period. In analysing the representation of women in democratic governance during this republic, both chronological and thematic approaches would be

adopted in this section. It is important to point out here that the level of participation of women in the politics of Nigeria during this republic was critical to their eventual representation in democratic governance. However, before interrogating this, it is imperative to have a glimpse of the circumstances that culminated in the birth of the Fourth Republic in 1999.

The birth of the Fourth Republic on 29 May 1999 was traced to the military regime of General Abdulsalam Abubakar, the eight military Head of State of Nigeria. Although the process of transition to democratic administration was started by General Sani Abacha, it was truncated as a result of his sudden death on 8 June 1998. General Abdulsalam, who took over the reins of power, had transition programme as part of his agenda for the country. Thus, in his broadcast to the nation, he publicly announced that he would hand over power to a democratically elected president on 29 May 1999. In the pursuit of this political programme, he dissolved the five political parties registered by National Electoral Commission of Nigeria under Abacha regime and set up new electoral commission known as Independent National Electoral Commission (INEC) (with Justice Ephraim Akpata as the pioneer Chairman), which later began the process of registration of new political parties. Initially, INEC wanted to grant provisional registration to nine political parties, with the condition that after the local government elections, political parties that had 10% votes and above in at least 24 states of the federation would qualify to contest the state and federal elections (Dode, 2013). However, INEC succeeded in registering only three political parties which participated in the first general elections that were conducted in the republic. These political parties were Alliance for Democracy (AD), All People's Party (APP) and Peoples Democratic Party (PDP). Following the success of presidential election of February 1999, which was contested by Chief Olusegun Obasanjo of the PDP and Chief Olu Falae of the AD/APP, on 29 May 1999, General Abdulsalam handed over power to Chief Olusegun Obasanjo, who was declared winner by INEC. This development marked the genesis of the birth of the Fourth Republic.

Having provided brief background of the birth of the Fourth Republic in 1999, our main focus now is to critically interrogate women's representation in democratic governance within the 24 years of the birth of the republic (1999–2023). In analysing this, we shall restrict ourselves to the representation of women at both federal and state levels, with major emphasis on elective and appointive positions both at the executive and legislative arms of government. Between 1999 and 2023, seven successive general elections were conducted by INEC in which democratic governance was consolidated both at the federal and state levels. Within this period, the participation of women in the politics of Nigeria at these two governmental levels witnessed major transformations. Significantly, evidences from the extant literature revealed that the level of involvement of women in the politics of Nigeria during this period varied across the 36 states of the federation, including the Federal Capital Territory, Abuja, as well as in the six geo-

political zones of the federation. It was shown that no state or geo-political zone was left out as regard women's representation in democratic governance either at the state or federal level, whether as elected candidates or appointees of the government. Also, the percentage of women's representation in democratic governance during this period both at the state and federal levels varied and depended on the political dispensation that emerged. The major transformations that occurred with respect to the representation of women in democratic governance between 1999 and 2023 would be critically analysed here.

4.1 Women's representation at the federal level: executive and legislative positions

The representation of the Women in democratic governance at the federal level would be examined in terms of participation as candidates in the general elections as well as appointees both at the executive and legislative arms of government. At the executive arm of government, there were records of women who contested as Presidential and Vice-Presidential candidates in the general elections between 1999 and 2023. Although the number of women who vied for the presidential and vice-presidential positions in the general elections during this period was very low, there was little increase in the number of women showed interest in these positions. In the first-four general elections conducted between 1999 and 2011, there was no record of any woman who vied for either the presidential or vice-presidential position.

The active participation of women in these two positions began during the 2015 general elections. In the 2015 general elections, of the fourteen presidential candidates that participated in the election, only one was female known as Professor Oluremi Sonaya. She contested under a minority political party, that is KOWA Party (KP). Also in the election, of the fourteen vice-presidential candidates, four were female. In the 2019 general elections, of the 73 presidential candidates that participated in the elections, six were women, with 22 female vice-presidential candidates, and they all contested under minority political parties (Opejobi, 2019). There was a little increase in the number of women who vied for these positions, from one in 2015 to six and four to 22 in 2019. However in the 2023 general election, the number of women who participated in the election as presidential candidate dropped to one, with no female presidential candidate. The representation of women in terms of contest for elective presidential and vice-presidential positions between 1999 and 2023 though changed, it was generally low. All the women that contested for these elective positions during this period were candidates of minority political parties. None of the major political parties namely Peoples Democratic Party (PDP) between 1999 and 2023 and All Progressives Congress (APC) between 2015 and 2023 presented women as their candidates for the two executive elective positions.

Table 1: List of female ministers during chief Olusegun Obasanjo Administration,1999–2007

No.	*Name*	*Ministry*	*Period*
1	Kema Chikwe	Transport Aviation	1999-2001 2001-2003
2	Aisha Ismail	Women Affairs and Youth Development	1999-2003
3	Rita Akpan	Women Affairs	2003-2005
4	Mobolaji Osomo	Housing, Land and Urban Development	2003-2005
5	Funke Adedoyin	State for Health	2003-2005
6		State for Education	2003-2005
7	Maryam Ciroma	Women Affairs	2005-2007
8	Obiageli Ezekwesili	Solid Minerals Education	2005-2007 2006-2007
9	Halima Tayo-Alao	State for Education State for Health	2005-2006 2006-2007
10	Helen Esuene	State for HeathEnvironment	2005-2006 2006-2007
11	Ngozi Okonjo-Iweala	Finance Foreign Affairs	2003-2006 2006
12	Nenadi Esther Usman	State for Finance Finance	2003-2006 2006-2007
13	Joy Ogwu	Foreign Affairs	2006-2007
14	Leslye Obiora	Solid Minerals	2007

Source: The Punch, 1999; The Guardian, 2003; The Tribune, 2005; The Premium Times 2007.

In terms of appointive positions, women served in the cabinet of successive democratic governments as ministers, ambassadors, advisers between 1999 and 2023. Evidences from the literature revealed that women served in the government of Chief Olusegun Obasanjo, 1999–2007, Alhaji Umaru Musa Yar'Adua (2007–2010), Goodluck Jonathan (2010–2015) and Muhammadu Buhari (2015–2023), though in varying number. The tables below show names and ministries of some of the women that served in different successive democratic administrations in the Nigeria's Fourth Republic between 1999 and 2023.

Table 2: List of female ministers during Alhaji Umaru Musa Yar'Adua administration, 2007–2010

No.	*Name*	*Ministry*	*Period*
1	Adenike Grange	Health	2007-2008
2	Halima Tayo-Alao	Environment & Housing	2007-2008
3	Diezani Alison-Madueke	Transport Mines & Steel Development	2007-2008 2008-2010
4	Grace Ekpiwhre	Science & Technology	2007-2008
5	Saudatu Bungudu	Women Affairs & Social Development	2007-2008
6	Dora Akuyili	Information & Communication	2008-2010
7	Salamatu Hussaini Suleiman	Women Affairs & Social Development	2008-2010
8	Fatima Balarabe Ibrahim	State for Energy (Power)	2007
9	Fidelia Njeze	State for Defence State for Agriculture & Water Resources	2007-2008 2008-2010

Source: The Punch, 2007; The Guardian, 2008; The Tribune, 2010.

Table 3: List of female ministers during Goodluck Jonathan administration, 2010–2015

No.	*Name*	*Ministry*	*Period*
1	Fidelia Njeze	Aviation	2010-2011
2	Dora Akuyili	Information and Communication	2010-2015
3	Ruquayyah Ahmed Rufai	Education	2010-2015
4	Diezani Alison-Madueke	Petroleum	2010-2015
5	Ngozi Okonjo-Iweala	Finance	2010-2015
6	Josephine Anenih	Women Affairs & Social Development	2010
7	Stella Oduah	Aviation	2011-2015
8	Erelu Olusola Obada	State for Defence	2011-2015
9	Olajumoke Akinjide	State for FCT	2011-2015
11	Viola Onwuliri	State for Foreign Affairs	2011-2015
12	Moboloji Johnson	Communication Technology	2011-2015
13	Zainab Ibrahim Kudi	State for Niger Delta Affairs	2011-2015
14	Zainab Maina	Women Affairs&Social Development	2011-2015

Source: The Punch, 2010; The Guardian, 2010; The Tribune, 2011; The Premium Times, 2015.

Table 4: List of female ministers during Muhammadu Buhari administration, 2015–2023

No.	*Name*	*Ministry*	*Period*
1	Zainab Ahmed	State for Budget & Planning Finance Finance, Budget & National Planning	2015-2018 2018-2019 2019-2023
2	Amina Mohammed	Environment	2015-2018
3	Kemi Adeosun	Finance	2015-2018
4	Khadija Bukar Abba Ibrahim	State for Foreign Affairs	2015-2018
5	Aisha Abubakar	State for Industry, Trade & Investment	2015-2019
6	Aisha Alhasan	Women Affairs & Social Development	2015-2018
7	Aisha Abubakar	Women Affairs & Social Development	2018-2019
8	Sharon Ikeazor	State for Environment State for Niger Delta Affairs	2019-2022 2022-2023
9	Ramatu Tijani Aliyu	State for FCT	2019-2023
10	Sadiya Umar Farouq	Humanitarian Affairs, Disaster & Social Development	2019-2023
11	Mariam Yalwaji Katagum	-	2019-2023
12	Gbemisola Saraki	State for Transport State for Mines & Steel Development	2019-2022 2022-2023
13	Pauline Tallen	Women Affairs & Social Development	2019-2023

Source: The Guardian, 2015; The Tribune, 2019; The Premium Times, 2023.

Table 5: List of female ministers under Bola Ahmed Tinubu administration, 2023

No.	*Name*	*Ministry*	*Period*
1	Barr. Hannatu Musawa	Art, Culture and Creative Economy	2023
2	Betta Edu	Humanitarian Affairs and Poverty Alleviation	2023
3	Hon. Nkeiruka Onyejocha	State for Labour and Employment	2023
4	Lola Ade-John	Tourism	2023
5	Hon. Uju Kennedy Ohaneye	Women Affairs	2023
6	Iman Suleiman Ibrahim	State for Police Affairs	2023
7	Doris Aniche	Industry, Trade and Investment	2023

Source: The Premium Times, 2023.

Tables 1, 2, 3, 4 and 5 above revealed list of female ministers that served in five different democratic administrations in the country between 1999 and 2023. From the tables, women were represented in the federal executive council of each government, though in varying number. In fact, some women served in two to three ministries under an administration, while some served under two different administrations. With the exception of the second term of President Olusegun Obasanjo in which 30% of women were ministers, in the others the percentage of women in the cabinet ranged between 14% and 25%. While during Yar'Adua, it was 18%, during Goodluck Jonathan, it was 25%. Also, during Buhari administration, women representation was 14% during first term and 16% during second term. Of the 45 ministers appointed by President Bola Ahmed Tinubu, seven (representing 16%) were female.

At the level of National Assembly, which comprises two houses of legislature (Senate-Upper House and House of Representatives-Lower House), women were represented between 1999 and 2023. Although the number of women's representation in the National Assembly varied across the 36 states of the federation and the Federal Capital Territory, Abuja, there was no election year in which at least one woman would not be elected into either the Senate (which made up 109 members) or House of Representatives (which made up 360 members). The tables below showed computed number of seats won by women vis-à-vis men between 1999 and 2023 in the two houses of legislature.

Table 6: Number of women elected into the Senate, 1999–2023

Year	***Total number of seats and percentages***				
	Number of seats	***Men***	***%***	***Women***	***%***
1999	109	106	97.2	3	1.8
2003	109	105	95.8	4	4.2
2007	109	101	91.92	8	8.08
2011	109	102	92.86	7	6.4
2015	109	102	92.86	7	7.14
2019	109	102	92.86	7	7.14
2023	109	106	97.25	3	2.75

Source: Eke, 2022.

The above table shows the number and percentage of women versus men elected into the Senate between 1999 and 2023. From the table, there was increase in the number of women that were elected into this upper house of legislature between 1999 and 2007. It started declining and remained static between 2011 and 2019, and dropped drastically in 2023. Within this period, women recorded the highest number in the Senate in 2007, with the total number of eight.

With respect to the elected principal officers at the Senate during this period, there was equally women's representation, though not encouraging. Between the 4th and the 10th Assembly (1999–2023), no woman was elected as either Senate President or Deputy Senate President. However, in the 4th Assembly, which was inaugurated in 1999, Senator Stella Unuezi Omu of the PDP from the Delta South Senatorial District of Delta State was elected as the Chief Whip. Also, in the 8th Assembly a female senator was elected as Deputy Minority Whip. Aside being elected as principal officers, majority of the female senators that were elected into the Senate during this period, were appointed as Chairmen and Deputy Chairmen of various Senate Committees.

Table 7**:** Number of Women Elected into the House of Representatives, 1999–2023

Year	***Total number of seats and percentages***				
	Number of seats	***Men***	***%***	***Women***	***%***
1999	360	347	96.4	13	3.6
2003	360	339	94.17	21	5.83
2007	360	335	93.06	25	6.94
2011	360	345	92.78	15	3.7
2015	360	338	93.89	22	6.11
2019	360	349	95.65	11	3.05
2023	360	345	92.78	15	3.7

Source: Eke, 2022.

The above table shows the number and percentage of women versus men elected into the House of Representatives between 1999 and 2023. From the table, there was increase in the number of women that were elected into this upper house of legislature between 1999 and 2007. It declined in 2011 and increased and 2015. It equally dropped drastically in 2019 and increased 2023. Within this period, women recorded the highest number in the Senate in 2007, with the total number of 25. Generally, the representation of women in the House of Representatives was not stable.

With respect to the elected principal officers at the House of Representatives during this period, there was equally women's representation in some of the principal officers of the House during this period. The representation of women in the principal officers of the House of Representatives between 1999 and 2023 was very encouraging unlike in the Senate. For instance, in the 6th Assembly which was inaugurated in 2007, a woman was elected as the Speaker of the House, known as Rt. Hon. Olubunmi Patricia Etteh (who represented (Ayedaade /Isokan/Irewole constituency in Osun State). She was the first female Speaker in the history of Nigeria's House of Representatives. However, she barely spent five months before was impeached on allegation of corruption, which was yet to be proved. In the 7th Assembly, which was inaugurated in 2011, Hon. Mulikat Akande Adeola of the PDP (who represented Ogbomoso North, South and Orire Federal

Constituency in Oyo State) contested for the position of Speaker, but later stepped down for Hon. Aminu Tambuwal. She was later elected as the Majority Leader of the House, becoming the first woman to hold that position. Also, in the 8th Assembly which was inaugurated in 2015, Hon. Fatima Binta Bello of the PDP (who represented Kaltungo/Shongom Federal Constituency in Gombe State) was elected as the Deputy Minority Whip of the House. In the 9th Assembly, which was inaugurated in 2019, Nkeiruka Chiduben Onyejeocha of the APC (who represented Isuikwuato/Umunneochi Federal Constituency of Abia State) contested for the position of Speaker of the House against Femi Gbajabiamila. She later stepped down and was elected as the Deputy Chief Also, in the 10th Assembly, which was inaugurated in 2023, Adewunmi Oriyomi Onanuga of the APC (who represented Ikenne/Sagamu Remo North Federal Constituency) was elected as Deputy Chief of the House. Apart from being elected as principal officers of the House, majority of the female lawmakers that were elected into the House during this period, were appointed as Chairmen and Deputy Chairmen of various House Committees such as Trade and Investment, Health, and Women Affairs.

4.2 Women's reprsentation at the state level: executive and legislative positions

Generally, at the state level, women's representation could be seen both at the executive (serving as governor, deputy-governors, commissioners and special advisers) and legislative positions (serving as speakers and deputy speakers). At the executive position level, our discussion would be restricted only to the governorship and deputy governorship positions. First, at the executive position level, no woman had been elected as the Governor of any state in Nigeria between 1999 and 2023. However, following the impeachment of the then incumbent Governor of Anambra State by the Anambra State House of Assembly under the Hon. Mike Balonwu as the Speaker in November 2007, Dame Virginia Etiaba who was then the Deputy Governor was sworn in as the first female governor of Anambra state in particular and Nigeria in general. She barely ruled for three months (November–February), when Peter Obi was returned as the governor by the judiciary. Between 1999 and 2011 general elections, there was no active participation of women in terms of standing in as governorship candidates of either major or minor political parties. However, during the 2015, 2019 and 2023 governorship elections, there were evidences of women active representation as governorship candidates of both majority and minority political parties. While in the 2015 governorship election, 24 out of 380 candidates were women (representing just 6%), in the 2019 governorship election, 80 out of one, 66 were women (representing 8%). There was just 2% increase in the number of women who vied for governorship seat between 2015 and 2019. In the 2023 governorship election, the number of female contestants dropped to 24 out of 420 contestants. One major development with respect to the representation of women in elective position especially during the 2015 and 2023 general elections was that for the first time in political history of the Fourth Republic, women emerged as governorship

candidate of one of the major political parties in Nigeria, that is, All Progressives Congress (APC). In the 2015 governorship election, of the 24 women that were candidates, one was from the major political party (that is APC) known as Senator Aisha Jummai Al-Hassan (popularly known as Mama Taraba), others were from the minority political parties. Senator Aisha participated in the gubernatorial primary election, defeated other candidates and emerged as APC candidate in Taraba State. In the main governorship election, he contested against the then incumbent Governor of the State, Alhaji Darius Ishaku of the PDP. The election was initially declared inconclusive. In the rerun election, Senator Aisha was defeated.

Also, in the 2023 governorship election, Senator Aishatu Dahiru Ahmed (popularly known as Binani) emerged as the APC gubernatorial candidate in Adamawa State. She did not just emerge as the governorship candidate of the APC through consensus arrangement, but through a competitive and keenly contested primary election that involved prominent figures such as former Governor of Adamawa State, Muhammadu Jibrilla Bindow, pioneer Executive Chairman Economic and Financial Crimes Commission (EFCC), Nuhu Ribadu, and influential Federal legislator and chairman of the House Committee on Army, Abdurazaq Namdas. She defeated the three major male candidates by securing 430 votes with the runner-up, Nuhu Ribadu, receiving 288 votes (Daily Trust, 2023). In the main governorship election, Senator Dahiru contested against the incumbent governor, Alhaji Ahmadu Fintiri of the PDP. The election was equally declared inconclusive. In the re-run election, Fintiri was later declared winner of the election by INEC. Aside Senator Aishatu Dahiru, there were other 22 women who contested as governorship candidates during the 2023 general elections but under minority political parties such as Social Democratic Party, Peoples Redemption Party, Action Alliance Party, Action Democratic Party, Zenith Labour Party, Labour Party, Allied People's Movement, All People's Party, Action Alliance, Boot Party, National Rescue Movement, All Progressives Grand Alliance and Young Progressives Party.

Another major development with respect to the representation of women in elective executive position at the state level was in the deputy governorship position. Without doubt, between 1999 and 2023, women have done fairly well. Although the representation of women in this leadership position during this period varied across the 36 states and 6 geo-political zones of the federation, no single geo-political zone that was left. While the South West (with Lagos and Ogun States with highest number of female deputy governors: three times each) recorded the highest number of female deputy governors since the birth of the Fourth Republic (8), North East had the least with just only one (Adamawa State). The table below shows the current and previous names and states of female deputy governors in Nigeria.

Table 8: List of female deputy governors in Nigeria, 1999–2023

No.	*Name*	*State*	*Party*	*Period*
1	Kofoworola Akerele-Bucknor	Lagos	AD	1999-2003
2	Cecilia Eyo Ekpenyong	Cross Rivers	PDP	1999-2003
3	Salimot Badru	Ogun	PDP	2003-2007 2007-2011
4	Virginia Etiaba	Anambra	APGA	2006-2010
5	Sarah Adebisi Sosan	Lagos	ACN	2007-2011
6	Pauline Tallen	Plateau	PDP	2007-2011
7	Titiloyo Laoye-Tomori	Osun	ACN/APC	2010-2014 2014-2018
8	Adejoke Orelope-Adefulire	Lagos	ACN	2011-2015
9	Valerie Ebe	Akwa Ibom	PDP	2012-2015 2015-2019
10	Yetunde Onanuga	Ogun	APC	2015-2019
11	Cecilia Ezeilo	Enugu	PDP	2015-2019 2019-2023
12	Ipalibo Gogo Banigo	Rivers	PDP	2015-2019 2019-2023
13	Hadiza Balarabe	Kaduna	APC	2019-2023 2023 till date
14	Naimot Salako Ayodele	Ogun	APC	2019-2023 2023 till date
15	Monisade Afuye	Ekiti	APC	2022 till date
16	Ngozi Nma Odi	Rivers	PDP	2023 till date
17	Akon Enyakenyi	Akwa Ibom	PDP	2023 till date
18	Josephine Piyo	Plateau	PDP	2023 till date
19	Patricia Obila	Ebonyi	APC	2023 till date
20	Kaletapwa Farauta	Adamawa	PDP	2023 till date

Source: The Punch Newspaper, 2009, The Guardian Newspaper 2015, The Tribune Newspaper 2019 and The Premium Times Newspaper 2023

The above table shows the list of female deputy governors in Nigeria between 1999 and 2023. It revealed that women were represented in the deputy position at the executive council at the state level. It could be seen from the table that out of the 36 states of the federation, only 13 states had been able to give female the opportunity to be represented in the governorship position level. Also from the table, Lagos State top the list of the 36 states that had produced the highest number female deputy governors in Nigeria (securing three). She was followed by Ogun, Plateau, Rivers and Akwa Ibom, each produced two. Other eight states (namely Ekiti, Osun, Kaduna, Cross Rivers, Enugu, Ebonyi, Anambra and Adamawa) produced one each. The table also revealed that while

some female deputy governors served two consecutive terms in some states (such as Ogun, Akwa Ibom, Enugu, Rivers, Osun and Kaduna), others served just only one term.

At legislative level, women's representation could be seen in various State Houses of Assembly that emerged in Nigeria between 1999 and 2023. Although the number of female parliamentarians varied across the 36 State Houses of Assembly, women were represented in both the highest and lowest positions in the state parliament. The table below showed computed number of seats won by women between 1999 and 2023.

Table 9: State Houses of Assembly

Year	***Total number of seats and percentages***				
	Number of seats	***Men***	***%***	***Women***	***%***
1999	978	966	98.8	12	1.2
2003	951	912	96.0	39	4.0
2007	900	843	94.2	57	5.8
2011	900	832	93.1	68	6.9
2015	979	900	91.9	79	8.1
2019	991	946	95.59	45	4.41
2023	988	940	95.15	48	4.85

Source: Eke, 2022.

The table above showed the total number of female lawmakers at the 36 States of the federation between 1999 and 2023. From the table, there was steady increase in the number of female lawmakers between 1999 and 2015. The number declined during the 2019 general elections, and later increased by three seats in the 2023 general elections. With specific reference to the 2023 general elections in particular, of the 36 states, women were represented in only 21 states (namely Anambra, Kaduna, Bayelsa, Benue, Cross River, Delta, Ekiti, Oyo, Taraba, Nasarawa, Plateau, Kogi, Kwara, Akwa Ibom, Ogun, Lagos, Adamawa, Ondo, Enugu and Ebonyi States), though with varying number of seats in the State House of Assembly. In terms of geo-political statistical analysis, while the South West had the highest number female lawmakers (with 16 seats), North West had the least with just only two female lawmakers (and only from Kaduna State). Other geo-political zones included North Central (12), South-South (10), South-East (5) and North-East (3).

Apart from the emergence of the female lawmakers in the various states Houses of Assembly, their representation in various leadership positions in the state legislature equally deserve interrogation. Between 1999 and 2023, a number of female lawmakers had been represented in some top leadership positions in the States Houses of Assembly among which were Speaker, Deputy Speaker, Leader of the House, Deputy Leader of the House, Chief Whip, Deputy Chief, Clerk of the House, etc. We will restrict ourselves to

Speaker and Deputy Speaker of the House. The tables below show the names of female Speakers and Deputy Speakers of some States Houses of Assembly in Nigeria between 1999 and 2023.

Table 10: List of female speakers of States Houses of Assembly in Nigeria, 1999-2023

No.	*Name*	*State*	*Period*
1	Margaret Icheen	Benue	1999-2003
2	Titi Oseni-Gomez	Ogun	2003-2008
3	Eucharia Azodo	Anambra	2003-2011
4	Chinwe Nwaebili	Anambra	2011-2015
5	Monsuratu Jumoke Sunmonu	Oyo	2011
6	Rita Mmaduagwu	Anambra	2015-2019
7	Jumoke Akinjide	Ondo	2014-2017
8	Olubunmi Adelugba	Ekiti	2023 till date

Source: The Punch, 2011; The Guardian, 2015; The Tribune, 2023.

The table above showed the total number of female speakers that had emerged since the birth of the Fourth Republic in 1999 across the 36 States of the federation. From the table, one could see vividly that out of the 36 states, female speakers had emerged just in only 6 states. Of these six states, four from the South-West, only one from each of South-East and North-Central. The other three geo-political zones, namely South-South, North-East and North-West had not produced any female speakers. Also, of the six states that had produced female speakers since 1999, Anambra had the highest (3), other five states produced one each. In all, eight female speakers had emerged at the States Houses of Assembly in Nigeria between 1999 and 2023.

Table 11: List of Female Deputy Speakers of States Houses of Assembly in Nigeria, 1999-2023

No.	*Name*	*State*	*Period*
1	Adefunmilayo Tejuosho	Lagos	2007-2009
2	Felicia Bassey	Akwa Ibom	2019-2023
3	Latifat Ajayi	Ogun	2023
4	Lami Danladi	Benue	2023
5	Afiniki Dauda	Niger	2023

Source: The Premium Times, 2023.

The table above showed the total number of female Deputy Speakers that had emerged since the birth of the Fourth Republic in 1999 across the 36 States of the federation. From the table, one could see vividly that out of the 36 states, female Deputy Speakers had emerged just in only 5 states. Of these five states, two from the South-West (Lagos and Ogun), two from North-Central (Benue and Niger) and one from the South

South (Akwa Ibom). The other three geo-political zones, namely South-East, North-East and North-West had not produced any female Deputy Speaker.

5 CONCLUSION

The foregoing has critically historicise the representation of Nigerian women in governance under three major historical phases, namely pre-colonial, colonial and post-colonial periods. These historical phases revealed the change and continuity in the representation of women in governance. With special reference to the Fourth Republic, the paper examined the representation of women in both elective and appointive positions at the federal and state levels between 1999 and 2023. It argued that though women were represented in both levels of governments especially in the executive and legislative arms during this period, the percentage of their representation vis-à-vis men was very infinitesimal. In other words, the representation of women in democratic governance between 1999 and 2023 was very far below the recommendation of the United Nations Economic and Social Council Resolution of 1990 which recommended 30% minimum proportion of women in leadership position. Evidences from the statistics of women's representation in both elective and appointive positions at federal and state levels revealed that the percentage of women in both positions in democratic governance since 1999 had not reached 10% let alone 30% affirmation. In comparison with 54 African countries, Nigeria was ranked the lowest securing 54th position with a 5.45% female representation, while Rwanda was ranked the first with 47.95% (which was even more than UN recommendation. Other worst-performing countries in Africa with poor female representation in democratic governance were Algeria (second with 6.20%), Benin Republic (7.40%), the Gambia (8.6%) and Liberia (11.00%). Aside these five states including Nigeria, no other country in Africa had below 30% affirmation as regard women's representation in democratic governance.

The low representation of women in democratic governance both as elected political officers and appointees of the government during this Fourth Republic was hindered by a combination of factors among which were the nature of party politics, widespread prejudices and biases about women as political leaders, women's lack of interest in politics, women's lack of economic base, cultural factor, inept political leadership of some women politicians and so on. For instance, the nature of party politics of majority of political parties did not favour the women. This starts with the composition of the National Working Committee of the political parties. Aside the position of National Women Leader, which naturally is to be headed by a woman, other positions such as National Chairman, Deputy Chairman, National Secretary, National Treasurer, National Legal Adviser among others are mainly dominated by the men. This is the major body that determines who will emerge as the standard bearer of the party in the general elections both at the federal and state levels. Ikpe describes this challenge as personality dominated and paternalistic nature of political parties (Ikpe, 1997).

Another major challenge of low representation of women in democratic governance is finance. This challenge could be seen in the cost of purchasing mandatory expression of interest and nomination forms as well as the cost of prosecuting both primary and general elections. For instance, while APC pecked the cost of expression of interest and nomination forms for President, Governorship, Senate, House of Representatives and State House of Assembly as follows: N100 million, N50 million, N20 million, N10 million and N2 million respectively, PDP pecked her own as follows: N40 million, N21 milion, N3.5 million, N2.5 million and N 600,000. The implication of this high cost of mandatory expression of interest and nomination forms is to discourage those who are not financially buoyant from contesting.

Religious or traditional beliefs and practices equally hinder active participation of Nigerian women in politics. In many of the societies in Nigeria, religious and traditional practices often determine the role women play. Evidence from the literature has shown that due to adopted religion and some traditional practices women are not supposed to be at the helm of affairs where men are concerned. Anya argues that the greatest danger to this practice is the internalization of these belief systems which make women see politics as something out of their sphere (Anya, 2003). This particular challenge majorly affects women in Northern part of Nigeria. The resultant effect of this could be seen in the low rate of women representation in elective positions from Northern Nigeria between 1999 and 2023. There are several states in the North West and North East in particular where no single woman has been elected into either State House of Assembly or National Assembly.

Moreover, widespread prejudice and bias against women as political leaders and the incompetent political leadership of some women who have been assigned political positions in the past have been contributing factors to the low representation of women in democratic governance. Although there some women politicians who had distinguished themselves well in administration, there were some who did not do well. There is general saying that first impression lasts longer. The inept political leadership of some women politicians had led to why some major political parties failed to support female candidacy for some positions such as President, Vice-President, Governorship, Senate President and Speaker of the House of Representatives. These elective positions are seen to be very critical to committing into the hands of female politicians.

The paper, therefore, submits that the need to increase the level of women's representation in democratic governance is critical to the attainment of Goal 5 (Achieve Gender Equality and Empower all Women and Girls) of the Sustainable Development Goals by 2030. Thus, political parties should develop policies that would make it mandatory for certain number of seats (a minimum of 35%) at both the executive and legislative arms of government, to be reserved for women, as being practiced in some countries such as Kenya and Uganda. This should equally be given a legislative backing.

It advocates for political doggedness of Nigerian women in the face of intimidation by and electoral competition against their male counterpart.

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PUBLIC AWARENESS ON CIRCULAR ECONOMY DEVELOPMENT IN HUNGARY

Wael Brinsi,[1] *László Koloszár*[2]

Increasing public awareness is one of the major factors behind Europe's transition to the circular economy strategy. This paper aims to present the results of an evaluation of public awareness and attitudes about circular economy in Hungary. The data used in this study was collected by random distribution of questionnaires with 512 respondents in order to assess their awareness as well as willingness to buy more environmentally friendly products. Several hypotheses were established divided into 3 categories. The result shows, only 12% knew circular economy benefits and a clear correlation with the education level as the higher-educated respondents were more likely to know about circular economy which hinders sustainable policy adoption, requiring increased education and incentives to drive behavioral and systemic change. Regarding the waste segregation, Hungarian consumers give special attention to organic waste followed by glass and plastic waste, while clothes and batteries have lower care by the locals after use.

Key words: circular economy, public awareness, public willingness, questionnaire, Hungary
JEL: Q51, F64, N54

1 INTRODUCTION

Individuals have a direct and indirect impact on the shift to circular economy through their consumption decisions and behaviors (Shevchenko, 2023). Thus, the perception of circular products and solutions (such as reduce, repair, reuse, remanufacturing, and recycling) among customers is deepening focus on the aspects that encourage or discourage consumers from participating in circular economy are crucial components for circular economy development and important policy concerns from the

[1] Wael Brinsi, PhD. candidate, Alexandre Lamfalussy Faculty of Economics, University of Sopron, Bajcsy-Zsilinszky 4, 9400 Sopron, Hungary, e-mail: wael.brinsi@phd.uni-sopron.hu. https://orcid.org/0009-0003-3068-5979
[2] László Koloszár, associate professor, Alexandre Lamfalussy Faculty of Economics, University of Sopron, Bajcsy-Zsilinszky 4, 9400 Sopron, Hungary, e-mail: koloszar.laszlo@uni-sopron.hu. https://orcid.org/0000-0002-8545-8357

perspective of directing inhabitants toward more environmentally conscious purchases, behaviors, and lifestyles (Jacobs, 2022).

The circular economy has already been implemented in several European countries and areas, including Germany, Netherlands, and Sweden, while in other countries such as Austria and Finland the circular economy concept is still under consideration (Grdicet al., 2020).

Current circular economy studies in the EU display a wide range of research regarding circular economy awareness and attitudes among consumers (Domenech and Bahn-Walkowiak, 2019). However, it appears that there is a knowledge gap and an insufficient number of studies carried out within Hungary. Consequently, it's needed to narrow the scope and conduct empirical research due to a lack of data. To address this gap, this study aims to provide insight into the current attitudes of Hungarian consumers and their willingness toward circular economy development.

This study is useful and novel as it aims to investigate why ethical consumers select eco-friendly products and how consumer organizations can take those reasons into account to enhance their objectives and services and promote environmental sustainability.

The purpose of this study is to discover more about the factors that influence consumer circular economy awareness and the objectives of consumer organizations. The results of this study may also assist businesses in creating environmentally friendly goods that are motivated by consumer demand for green goods rather than just adhering to institutional or legal requirements.

2 LITERATURE REVIEW

Camacho-Otero (2018) pointed out at the literature on consumption in the circular economy and categorized the major elements affecting how consumers perceive and embrace circular goods and solutions into seven categories. The identified variables range from physiological characteristics (attitudes, values, habits, or ideologies) to personal characteristics (materialism, need for uniqueness, or desire for change) to other product-related parameters (quality, longevity, design, risks, or uncertainty), as well as aspects related to their knowledge and understanding (Jacobs, 2022).

We examine into the role of consumer associations contribute to encouraging environmental sustainability, as well as the environmental profile and responsiveness of a sample of Spanish-speaking consumers (Jaca et al., 2018). The findings demonstrate that consumers are knowledgeable of the circular economy and consider the CE's dimensions when trying to consume sustainably.

A fundamentally ecological culture and social awareness are necessary for the development of a conscientious circular economy society. Since circular economy is a novel idea in Europe, it is crucial to monitor and evaluate the people's awareness of CE. In order to successfully implement circular economy as a long-term development strategy

across the EU, special focus should be dedicated to raising awareness among the younger generation, whose knowledge, attitudes, and purchase behaviors will have the greatest impact on the development of a CE-oriented culture (Kanchanapibul, 2013).

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Consumer demand for ecologically friendly goods has increased as a result of environmental concerns. New environmental ethics emerged from this, raising consumer's awareness and significantly influencing their purchasing patterns. Industries have responded by developing a range of green initiatives, including green supply chain management, green product and service design, and creative approaches (Filipe Coelho, 2017).

In March 2020, the European Commission submitted an action plan for the implementation of the circular economy, which was voted by the Parliament in February 2021. In March 2022, the Commission published the first package of measures to accelerate the transition to a circular economy. In the same year, the Commission proposed new EU-wide packaging rules.

On January 1, 2024, a new redemption system for beverage packaging came into force in Hungary, the so-called mandatory redemption fee system, in connection with which the VAT regulation was also amended when it entered into force on January 1, 2024.

The European CE focus is on business opportunities, together with resource efficiency goals. CE became prominent only very recently due to fears around high commodity prices, despite its origins from Europe. The attention is mainly on materials, resources, and waste and much less on broader environmental pollution. The European approach places more emphasis on consumption and product design compared to the Chinese approach. Europe's already existing well-developed eco-design system, covering a wide range of household goods, makes it easier to extend the system to cover the Circular Economy (McDowall et al., 2017).

3 DATA AND METHODOLOGY

A primary data was used in the following study via questionnaire. The inclusion criteria for this questionnaire-based study are designed to ensure a diverse and representative sample of the target population within Hungary. Participants must be residents of Hungary, with no restriction on geographical location, thereby including individuals from all regions of the country—urban and rural areas alike. Additionally, the

study aims to capture a broad spectrum of educational level, therefore, individuals with varying levels of education, from primary education to higher education degrees, are eligible to participate.

The primary exclusion criterion is age: individuals over 18 years of age are not eligible to participate in the study. This criterion is established to specifically focus the research on the perspectives, experiences, or behaviours of individuals who are 18 years old. Participants who do not meet this age requirement will be excluded from the study to maintain the integrity and relevance of the data collected.

The questionnaire was designed Online via "Lime Survey" software with both English and Hungarian languages to facilitate data collection and was distributed to Hungarian consumers who were targeted through snowball technique. Using innovative ways to distribute the questionnaire: Intercept Surveying which involves *approaching people in public places*, such as train stations or in front of supermarkets, to ask them to participate in a questionnaire.

Cronbach's alpha was utilized to assess the reliability of the questionnaire employed in this study. Cronbach's alpha serves as a measure of internal consistency, with coefficients ranging from 0 to 1; higher values indicate greater reliability. According to Taber (2018), α values between 0.45 and 0.98 are considered acceptable by various authors.

The environmental concern scale, consisting of 4 items, demonstrated acceptable reliability (α = 0.58). Similarly, the green product perception scale (5 items, α = 0.64), current practices scale (6 items, α = 0.45), consumer willingness scale (5 items, α = 0.51), and influencing factors scale (5 items, α = 0.50) all exhibited acceptable internal consistency.

Table 1: Reliability analysis

Reliability Statistics - Cronbach's Alpha		
Scale	***Cronbach's Alpha***	***Number of items***
Environmental Concern	0.58	4
Green Product Perception	0.64	5
Current Practices	0.45	6
Consumer Willingness	0.51	5
Influencing Factors	0.50	5

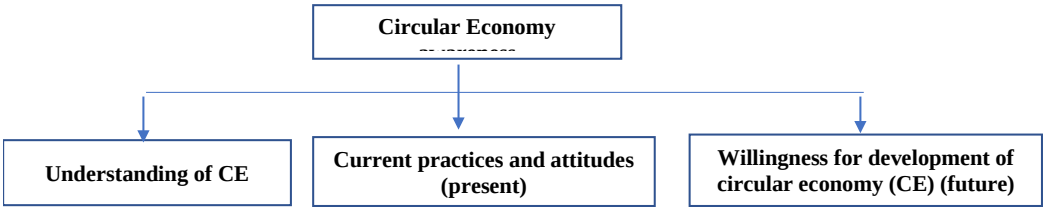
Source: processed by author.

A total of 523 questionnaires were distributed to the respondents and 512 questionnaires were obtained, 11 questionnaires were not taken into consideration because were not completed. Based on these, the total number of the analyzed questionnaires is 512 and the response rate is 98%The respondents used their contacts and social networks to share the questionnaire with other people. This questionnaire promises not to disclose the respondent's names but required them to fill in their income

level, age, and level of education in order to erase and eliminate their mistrust. The questionnaire composed of 13 closed questions categorized into four sections which are detailed as follows:

1. The first section consists of 4 questions about sample description. The questions are as follows:
- Age of the respondent, Gender of the respondent, Education level, Place of living;
2. The second section aims to evaluate consumer's knowledge and understanding about circular economy approach. The questions are as follows:
- Have you heard of circular economy? Are you familiar with Circular Economy benefits?
3. The third section aimed to explore the current practices and attitudes toward circular economy approach. The questions are as follows:
- Waste segregation in the daily life, To what extent you are adopting the following eco-friendly activities (Likert scale)?
4. The fourth section attempts to find out consumer's willingness to develop circular economy approach. The questions are as follows:
- Willingness to pay more for green product (Multiple choice question), Willingness to adopt the Eco-friendly activities (Likert scale).

Figure 1: Proposed study structure



Source: processed by author.

The following hypotheses were established before sending out the questionnaire. We have categorized 3 main hypetheses based on research objectives. 2 hypotheses to determine to what extent the respondents are aware of circular economy benefits, 7 hypotheses to find out whether the basic practices of the circular economy are followed, and 6 hypotheses to explore the respondent's willingness. The threshold of below hypetheses are based on the study in Blugaria by (Zhelyazkova, 2017). The stated hypothesys are:

H1: Awareness of Circular economy:

– H1-1: At least 50% of respondents know the concept of circular economic;

- H1-2: At least 25% of respondents are familiar of circular economic benefits.

H2: Current practices and attitudes:

- H2-1: A maximum of 25% of respondents do not separate the waste;
- H2-2: At least 65% of respondents pay attention to water and electricity saving;
- H2-3: At least 65% of respondents take shopping bags with me when shopping;
- H2-4: At least 65% of respondents buy products with 100% recyclable packaging;
- H2-5: At least 65% of respondents use energy-saving lamp at home;
- H2-6: At least 65% of respondents use a public transport vehicle or bike;
- H2-7: At least 65% of respondents repair the electronic devices to keep using them as long as possible.

H3: Consumers willigness for Circular economy adoption:

- H3-1: At least 75% of respondents accept stricter rules and environmental regulations;
- H3-2: At least 75% of respondents recommend green products to my friends and family;
- H3-3: At least 75% of respondents make a special effort to buy products that are made from recycled material;
- H3-4: At least 75% of respondents are willing to change the brand choice to buy from companies that show greater care for the environment;
- H3-5: At least 75% of respondents agree with the policy of charging a fee for a shopping bag;
- H3-6: A maximum of 25% of respondents are not willing to pay extra for green products.

The chapter includes data analysis and interpretation of the results. Various types of statistical data processing methods will be used to screen, interpret, and display the data. The primary data were collected from a total of 512 respondents. The data were coded and analyzed with appropriate statistical analysis using SPSS version 25. The data analysis would also allow the researcher to test the hypotheses that have been formulated. The statistical tests performed in this study include the Chi square test and correlation, and so forth.

Table 2 presents the valid final sample description which is homogeneous and representative sample which consisted of 512 respondents, 48% were female and 52% of whom were male. The characteristics of sample suggest that the respondents were generally educated where 43% of the respondents has university degree, 34% has secondary school and only 23% has primary school. In terms of living place, Budapest was the most common residence (34.2%, n = 175), with smaller percentages living in towns, split by population size, and villages.

Table 2: Sample description

		Number of respondents	***Percentage***
Gender	Male Female	266 246	52% 48%
Age	18 – 30 31– 45 46 – 60 Over 60	167 142 134 69	33% 28% 26% 13%
Educational level	Primary School Secondary school University and college	119 174 222	23% 34% 43%
Place of living	Village Town (less than 40 000 people) Town (more than 40 000 people) Budapest	94 132 11 175	18% 26% 22% 34%

Source: processed by author.

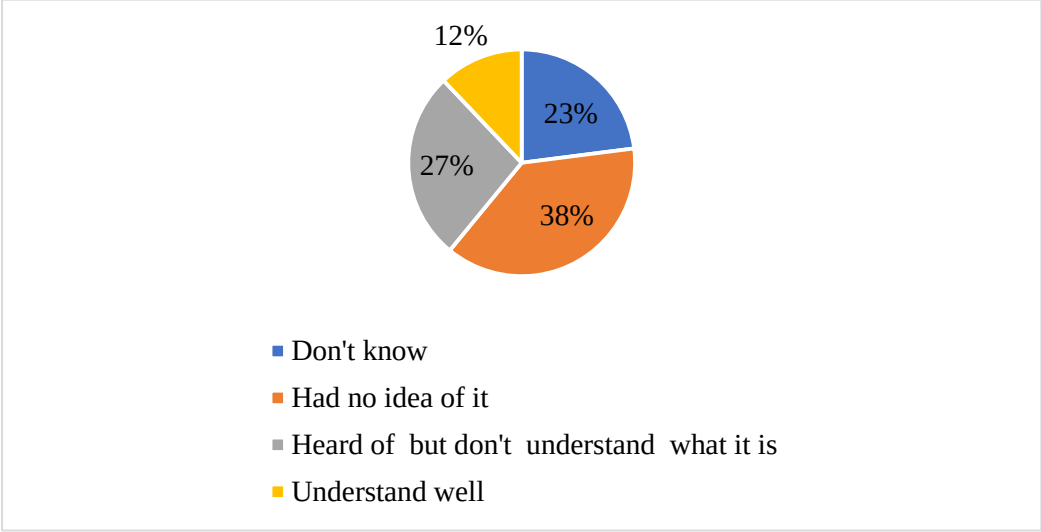
4 RESULTS

The respondents were asked whether they had ever heard of CE, as it is presented in below Figure2, the results show over a third of the respondents (36.7%) indicated that they had heard of it.

One of the survey's significant findings was that circular economy awareness is relatively low, only 12% of respondents indicated that they are knowing the benefits of CE. Less than a third (27%) indicated that they had heard of it but did not really know what it was. The majority, almost two-thirds (61%), had no idea or they don’t know, as it is shown on Figure 2.

This percentage highlights the level of awareness and comprehension among respondents, and a high value indicates a significant knowledge gap that may hinder the adoption of circular economy principles. Understanding this figure is essential for identifying the need for targeted educational initiatives and public awareness campaigns aimed at promoting sustainable development practices.

Figure 2: Awareness of circular economy benefits



Source: Source: processed by author.

There were a few demographic sub-group differences in terms of whether people have heard of CE.

Table 3: Awareness of circular economy by education level

	Total	***Primary school***	***Secondary school***	***University and college***
Respondents	**512**	**118**	**173**	**221**
	100%	**23%**	**34%**	**43%**
Understand well	**61**	1	10	50
	12%	1%	6%	23%
Heard of but don't understand what it is	**136**	5	37	94
	27%	4%	21%	43%
Had no idea of it	**197**	58	85	54
	38%	49%	49%	24%
Don't know	**118**	54	41	23
	23%	46%	24%	10%

Source: processed by author.

The responses on table 3 show a clear correlation with the education level as the higher-educated respondents were more likely to know about circular economy : 23% of university and college respondents are familiar with circular economy benefits and 43% Heard of but don't understand what it is.

Table 4: Awareness of circular economy by age

	Total	***Understand well***	***Heard of but don't understand what it is***	***Had no idea of it***	***Don't know***
18 - 30 years old	**167**	32	54	57	24
	33%	20%	32%	34%	14%
31 - 45 years old	**142**	9	41	56	36
	28%	6%	29%	40%	25%
46 - 60 years old	**134**	14	29	49	42
	26%	10%	22%	37%	31%
Over 60 years old	**69**	6	12	35	16
	13%	9%	17%	51%	23%

Source: processed by author.

As mentioned in the previous section, the data reflects a strong correlation with the respondent's age (Table 4), the youngest respondents are more likely to know or heard about CE: 20% of the respondents who belong to 18-30 years old understand well the circular economy practices.

Table 5: Channels to circular economy information acquisition

	Radio and TV	***Newspaper and Magazine***	***Government Document***	***Internet and social media***
18 - 30 years old	4	20	56	77
31 - 45 years old	15	28	47	45
46 - 60 years old	26	37	35	35
Over 60 years old	16	30	21	2
Total	**61**	**115**	**159**	**159**
	12%	**22%**	**31%**	**31%**

Source: processed by author.

One of the key questions regarding the main channel of circular economy information acquisition, the results on Table 5 showed that the "Internet and Social media" and " Government Documents" are the official channels for picking up information about circular economy practices and Eco-friendly habits, which count 31% each. The government plays a crucial role in awareness campaigns to encourage consumers: Sort garbage and optimization of energy use (electricity, water, gas),

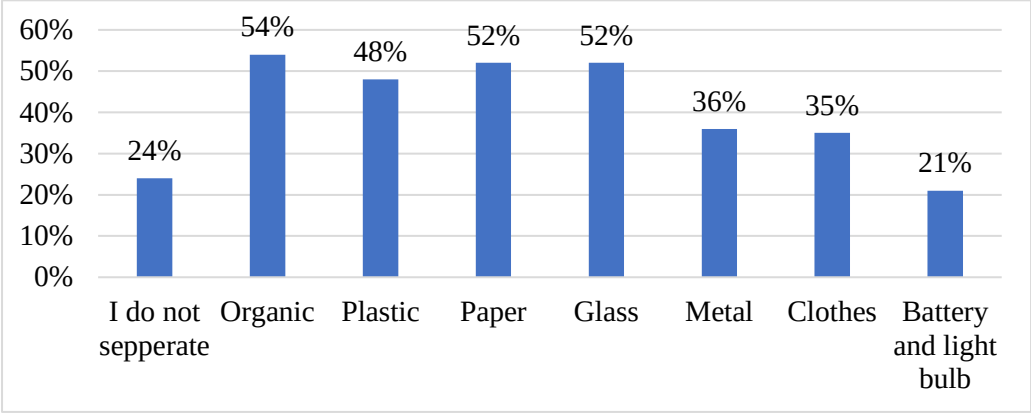
however, internet, especially social media provides easy access to acquire information about the characteristics of products and best practices for circular economy .

There were a few demographic subgroup differences in terms of age, where the younger generation rely more on the Internet and social media for getting environmental protection knowledge, while, the older generation prefers "Newspaper and Magazine" and "Radio and TV". Besides, 4% of the respondents chose “Other” and states that they have got the circular economy information during their studies at the university.

Waste sorting is one of the most visible side effects of consumption and has been introduced in several countries for many years. The first sorting experimentation program started in 2000, followed by a collecting cost in 2002 (Guo et al., 2021). In China, new waste disposal systems were launched in the early years of the twenty-first century. Therefore, the respondents were asked about their practices toward garbage sorting and how they are sorting their garbage in their daily life. The respondents have to select either they separate (7 types of waste) or do not separate.

Based on the results shown in Figure 3, 24% of the respondents never sorted the garbage in daily life. The questionnaire shows that most of the locals give special attention to Organic waste 54% followed by Glass and Plastic waste which count 52% each, while Clothes and batteries have lower care by the locals after use. Overall, the result revealed a positive attitude from Hungarian consumers, however, mutual efforts are required from the government and consumers to have a higher performance toward garbage sorting.

Figure 3: garbage segregation by consumers



Source: processed by author.

Consumers can positively contribute to the adoption of circular economy by adopting eco-friendly activities in their daily activities (Tosun et al., 2023). In the following question, the respondents were asked about the frequency of adopting an eco-friendly activity, six eco-friendly activities being considered, and which frequencies have

been measured on a 5 responses scale (Table 5), where: (1) = never, (2) = rarely, (3) = sometimes, (4) = often and (5) = alway.

Table 6: Current eco-friendly attitudes

	Answers scale					***Statistical result***	
	Never	***Rarely***	***Sometimes***	***Often***	***Always***	***Mean***	***St. dev.***
Pay attention to water and electricity saving	0.19%	9.17%	27.30%	46.67%	16.60%	3.70	0.86
Take shopping bags with me when shopping	1.95%	16.01%	23.20%	30.66%	28.12%	3.67	1.11
Buy products with 100% recyclable packaging	1.95%	25.39%	36.52%	31.60%	4.49%	3.11	0.90
Use energy-saving lamp at home	1.36%	10.35%	20.11%	40.03%	28.12%	3.83	1.00
Use a public transport vehicle or bike	3.51%	11.71%	13.28%	30.85%	40.62%	3.93	1.15
Repair the electronic devices to keep using them as long as possible	0.78%	9.37%	24.02%	40.03%	25.78%	3.81	0.95

Source: processed by author.

Among the highest rates for eco-friendly activities, 'Use a public transport vehicle or bike' is done on an often basis or always by 71.47% of the respondents. Using public transport or bikes maximizes resource efficiency, waste reduction, emission reduction, and sustainable practices. These choices enhance a more sustainable and circular approach to transportation.

Table 7: Consumers' willingness for eco-friendly activities

	Answers scale					***Statistical result***	
	Strongly disagree	***Disagree***	***Neither agree nor disagree***	***Agree***	***Strongly agree***	***Mean***	***St. dev.***
Accept stricter rules and environmental regulations	0.19%	5.07%	29.10%	46.48%	19.14%	3.79	0.81
Recommend green products to my friends and family	0%	1.36%	21.28%	49.21%	28.12%	4.04	0.74
Make a special effort to buy products (plastic and paper, ...) that are made from recycled material	0.39%	1.75%	22.85%	47.85%	27.12%	4.00	0.78
Change the brand choice to buy from companies that show greater care for the environment	0.19%	2.34%	22.26%	46.67%	28.51%	4.01	0.79
I agree with the policy of charging a fee for a shopping bag	0.19%	8.59%	26.95%	37.89%	26.36%	3.82	0.93

Source: processed by author.

Also 'Use energy-saving lamp at home' rates are relatively high among the eco-friendly activities with 68.15% of the respondents adopting this eco-friendly activity often or always.

Of respondents, 65.81% tend to 'Repair the electronic devices to keep using them as long as possible' which is relatively low.

Another eco-friendly way is 'Pay attention to water and electricity saving', 63.27% of respondents confirmed that they often or always adopt it. Though it may seem a big figure, it still is far away from that of more than 90% considering the concern for the environment as important or very important.

Buying products with 100% recyclable packaging' rates are low even compared to other eco-friendly activities, with only 36.09% of the respondents declaring to make it on an often basis or always. It is a tangible way for consumers to boost conserving resources and minimize the environmental impact associated with packaging.

Taking shopping bags with me when shopping' does not rate much higher than the precedent one as only 58.94% stated to make it on an often basis or always. The use of reusable bags which are typically made from durable materials such as cotton or polyester, contributes to energy savings and reduces the demand for new plastic production.

Customers are obliged to adopt new behaviors to mitigate their concerns, and this will motivate service providers to introduce more environmentally friendly products in order to tackle the environmental issues, climate change and the finite natural resources.

The shift to a circular economy strategy requires consumer contribution in the acquisition, use, and disposal of products and services (Shevchenko, 2023). A 5-point Likert scale question was used to analyze the willingness to be involved in the Circular economy through different types of engagement from consumers (Table 6).

The statement "Recommend green products to my friends and family" holds significant importance for the consumers as it is shown on table 6 with 4.04 mean. The respondents agree to recommend the green products as it contribute to personal well-being, environmental sustainability, and global responsibility.

The data showed a positive willingness from the study participants to Change the brand choice to buy from companies that show greater care for the environment, this is demonstrated the overall mean which counts 4,01. Embracing the following statement supports companies that prioritize the environment is a powerful force for positive change. It indicates a conscious effort to align customer behavior with environmental values and boost a more sustainable and responsible global economy.

Making a special effort to buy products made from recycled materials is crucial practice for consumers which aligns with resource preservation and Closed-Loop systems by recycling the product. The majority of respondents showed their willingness to change the consumption habits from regular to recycled materials products.

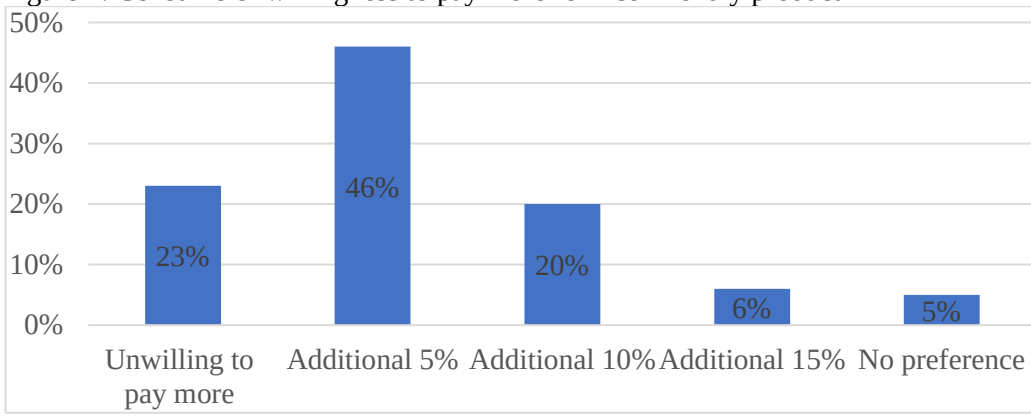
The respondents showed a reluctance for these statements 'Implementing extra fees for plastic bags' and 'accepting stricter rules and environmental regulation' that might be perceived as an additional burden for the budget. This is clearly demonstrated by the lowest attributed mean on Table 6.

The result showed that in case of product availability, 77% of the consumers are willing to pay higher prices for eco-friendly products which is ranging from 5% to 15%

and more. A similar study by Millock and Hansen (2002) in Denmark stated that only 18% of consumers are not willing to pay for all kinds of products (Aryal et al., 2009).

The respondents revealed that 46% of the interviewees are willing to pay up to a 5% price premium compared with ordinary products. Similarly, 20% of the consumers like to pay up to a 10% additional for the eco-friendly products. In addition, the minority are willing to pay up to 15% which accounts for 5% of total respondents. However, 23% of the consumers are not willing to pay more (Figure 4).

Figure 4: Consumers' willingness to pay more for Eco-friendly product



Source: processed by author.

Aryal et al. (2002) stated that the primary motivation for buying organic products is health, followed by attributes of quality including flavor, color, and taste. The Kathmandu Valley noticed a rise in demand for these products; however, in order to further promote them, some factors that need to be taken into account in the future are the lack of consumer information, the lower prices of these products compared to conventional foods, and the limited and unpredictable domestic supply.

Table 8: Consumers' willingness to pay more for eco-friendly product by age category

	Unwilling to pay more	***Additional 5%***	***Additional 10%***	***Additional 15%***	***No preference***
18 - 30 years	42	82	24	12	7
	25%	50%	14%	7%	4%
31 - 45 years	27	58	40	9	8
	19%	41%	28%	7%	5%
46 - 60 years	32	64	25	7	6
	23%	48%	19%	5%	5%
Over 60 years	16	35	11	1	6
	23%	51%	16%	2%	8%

Source: processed by author.

The study revealed that among the surveyed consumers age category of 18 - 30 years are less willing to pay more, this could be explained by the limited income (Table 8). In contrast, all other categories showed a positive willingness.

5 CONCLUSION

This study is conducted to run an imperial investigation among consumers and businesses in Hungary in order contribute to the future researches in the subject circular economy implementation with the goal of providing practitioners and academics a comprehensive understanding of CE, challenges and consumers' willingness.

In this study, we analyzed the role of stakeholders (consumers, suppliers, businesses, government, etc.) in CE implementation, however, cooperation is required for the successful shifting to ensure the seven pillars operate harmoniously. The importance of working collectively, being able to delegate, and communication are the various elements identified during our study. Taking environmental and social aspects into account should not have negative consequences on the company's financial performance, while the challenge is to find a balance between the environment, the economy, and society.

Effective adoption of the circular economy relies on close collaboration between the government, consumers, and businesses, each of them has a complementary and essential role to play. The government serves as a stimulant by establishing a favorable regulatory framework, developing incentive policies (subsidies, green taxation, environmental standards), and investing in the research, education, and infrastructure necessary for the circular transition. It must also foster the emergence of public-private partnerships and integrate circular principles into public procurement. Businesses, for their part, are at the heart of operational change: they are responsible for rethinking their business models, designing durable, reusable, or recyclable products, and developing innovative resource management solutions. They can also educate consumers by making their practices more transparent and traceable. Finally, consumers have significant influence through their purchasing choices: by favoring eco-designed, repairable, or recycled products, they encourage businesses to adopt sustainable practices. Their behavior can accelerate the demand for circular solutions, especially if they are informed and aware of the environmental impacts of linear consumption. The interaction between these three actors is therefore essential to make the circular economy a viable, inclusive, and sustainable model.

This study advances theoretical understanding by exposing the limitations of traditional consumer behaviour frameworks, which often neglect sustainability as a driving factor, and proposes an expanded model that incorporates eco-conscious motivations and social influences. By revealing a strong willingness among consumers to adopt circular economy practices when properly informed and supported, the research bridges the gap between theory and practice. It provides a nuanced view of how pro-

environmental attitudes can translate into action, offering valuable guidance for designing effective CE interventions.

The evaluation of public circular economy awareness is the first step to understanding the levels of circular economy knowledge that Hungarian consumers have. This study aims to examine the behaviors of those residents in Hungary by conducting a questionnaire. The key research findings of this study include:

The young generation seems to be more involved than other age groups to the environmental issues and promoting CE. In terms of demographic sub-categories, consumers awareness has a positive correlation with their education level, whereas their environmental conscious level and resource preservation behavior has a positive correlation with their age category. Thus, promotion of behaviors should focus on the younger age groups.

Despite the positive current attitudes, the results showed that a higher percentage of the consumers give their priority to the environmental elements related to saving energy and gaining some economic benefits, such as pay attention to electricity consumption and repairing electronic devices. So, these are economical consumption attitudes rather than conservation-conscious attitudes. Regarding garbage sorting, Hungarian consumers have a positive attitude, however, this should be supported and followed by a governmental instruction or relevant knowledge.

The research findings are particularly useful for decision-makers and businesses to understand just how effective their circular economy promotion actions and strategies are at shaping the transition to a circular economy business model of development. The study framework prepared could be inspired for carrying out CE-related studies in other European countries and elsewhere in the world. It could also be helpful for exploring the relationship between public awareness about circular economy and progress toward realizing a circular economy in specific countries.

The research also has limitations. Existing study explored the circular economy awareness issues, current practices and consumers' willingness in Hungary is quite limited. Second, many other factors and activities can also be related to circular economy adoption and practices could be added in future studies. Thirdly, another sub-category could be added which is net income for respondents. We initially created 15 hypotheses to test. The outcome of the verification is available in Appendix A.

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Appendix A: Summary of hypothesis output

	Hypothesis	*Result %*	*Accepted/rejected*
Knowledge of CE	**H1-1:** At least 50% of respondents know the concept of circular economic	36.7%	**Rejected**
	H1-2: At least 25% of respondents are familiar of circular economic benefits	12%	**Rejected**
Current practices	**H2-1:** A maximum of 25% of respondents do not separate the waste	24%	**Accepted**
	H2-2: At least 65% of respondents pay attention to water and electricity saving	63.27%	**Rejected**
	H2-3: At least 65% of respondents take shopping bags with me when shopping	58.78%	**Rejected**
	H2-4: At least 65% of respondents buy products with 100% recyclable packaging	36.09%	**Rejected**
	H2-5: At least 65% of respondents use energy-saving lamp at home	68.15%	**Accepted**
	H2-6: At least 65% of respondents use a public transport vehicle or bike	71.47%	**Accepted**
	H2-7: At least 65% of respondents repair the electronic devices to keep using them as long as possible	65.81%	**Accepted**
Willingness for CE adoption	**H3-1:** At least 75% of respondents accept stricter rules and environmental regulations	65.62%	**Rejected**
	H3-2: At least 75% of respondents recommend green products to my friends and family	77.33%	**Accepted**
	H3-3: At least 75% of respondents make a special effort to buy products that are made from recycled material	74.97%	**Rejected**
	H3-4: At least 75% of respondents are willing to change the brand choice to buy from companies that show greater care for the environment	75.18%	**Accepted**
	H3-5: At least 75% of respondents agree with the policy of charging a fee for a shopping bag	64.25%	**Rejected**
	H3-6: A maximum of 25% of respondents are not willing to pay extra for green products	23%	**Accepted**

Source: processed by author.

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PASKAL ZHELEV: BULGARIA IN THE GLOBAL ECONOMY – DYNAMICS, CHALLENGES, AND OPPORTUNITIES

Cham: Springer Nature, 2025, 229 p., ISBN 978-3-031-87922-7

Predrag Bjelic[1]

The recently published monograph Bulgaria in the Global Economy: Dynamics, Challenges, and Opportunities by Paskal Zhelev offers a timely, data-rich, and policy-oriented assessment of how a small, open EU economy, Bulgaria, has navigated successive waves of globalisation, regional economic integration, and technological change. It explores Bulgaria's evolving role in the global economy through the lens of structural transformation, foreign economic relations, and institutional capacity.

The book is part of the Societies and Political Orders in Transition series, published by Springer, which is recognized for its analytically rigorous studies on post-socialist transformations. Zhelev's monograph aligns perfectly with this mission, offering a data-driven and policy-relevant analysis that will appeal to economists, political economists, and scholars of international economic relations and European integration.

The book's structure is coherent and logical, divided into fourteen chapters that cover Bulgaria's historical economic evolution, macroeconomic stability, EU integration, trade and investment patterns, regional cooperation in the Black Sea region, participation in the global value chain (GVC), technological transformation, and sustainability efforts. Chapters are meticulously researched, drawing on both qualitative analysis and an impressive body of empirical data, including figures, tables, and comparative indices that

[1] Prof. Dr. Predrag Bjelic, Faculty of Economics and Business, Department of International Economic Relations, University of Belgrade, Kamenička 6, 11000 Belgrade, Serbia, e-mail: predrag.bjelic@ekof.bg.ac.rs. https://orcid.org/0000-0002-9777-8403
Prof. Predrag Bjelic is a Full Professor at the Department of International Economic Relations, Faculty of Economics and Business, University of Belgrade. He currently serves as President of the Doctoral Commission at the same faculty. He has held visiting positions at Harvard (as a Fulbright Scholar), LSE, and the University of Oslo Faculty of Economics. Prof. Bjelic has authored numerous books and over 100 scholarly articles on international trade, trade policy, regional integration, and the Western Balkans. He has served as a consultant and lecturer to international institutions, including the WTO and UNCTAD.

illustrate key economic trends, particularly over the past decade, across various sectors and policy domains.

A notable strength of the book is its historical contextualization. Chapter 2, for example, provides a detailed exploration of Bulgaria's path-dependent economic trajectory – from the post-Ottoman agrarian economy to socialist industrialization and post-1990 liberalization. Zhelev is particularly effective in demonstrating how Bulgaria's alignment with dominant external economic partners – Germany, the Soviet Union, and later the European Union – has shaped both its opportunities and vulnerabilities.

The analysis of Bulgaria's macroeconomic fundamentals (Chapter 3) and its integration into the EU (Chapter 4) stands out for its clarity and breadth. Chapter 3 traces the country's macroeconomic trajectory since the introduction of the Currency Board Arrangement (CBA) in 1997 and also assesses Bulgaria's readiness for Eurozone accession through the lens of Optimum Currency Area (OCA) theory. It maintains that beyond meeting the Maastricht criteria, structural alignment, economic flexibility, and long-term policy credibility will be essential for sustainable participation in the common currency area. Chapter 4 critically examines the outcomes of EU integration, focusing on the limits of convergence within the Union's framework. While accession has facilitated market access and capital inflows, Zhelev argues that it has not produced a durable shift toward innovation-driven, high-value-added growth. This analysis reinforces the volume's broader message that convergence within the EU context is not automatic, and that Bulgaria's long-term trajectory depends on domestic institutional reform and strategic upgrading.

Chapters 5 and 6 broaden the external dimension of Bulgaria's economic integration by examining its regional and global partnerships. Chapter 5 focuses on the Black Sea region, framing it as both a geopolitical flashpoint and a potential platform for economic cooperation. Zhelev assesses Bulgaria's participation in initiatives such as the Black Sea Economic Cooperation (BSEC) and the EU's Black Sea Synergy, noting that despite institutional weaknesses, the region holds underutilized potential for connectivity, energy coordination, and trade diversification. Chapter 6 examines Bulgaria's bilateral foreign economic relations with the EU, the United States, and China, highlighting asymmetries in trade and investment, and underscoring the need for a more strategic and balanced foreign economic policy.

This outward-looking perspective sets the stage for the following chapters, which delve into the structure and dynamics of Bulgaria's international trade in goods and services (Chapters 7 and 8), and participation in global value chains (Chapter 9). The author highlights the persistent structural dependence of Bulgaria's economy on low-value-added activities, coupled with limited domestic upgrading and innovation. These findings reflect broader patterns observed among small, post-socialist EU economies and their ongoing struggle to move up the value chain, thereby contributing to comparative

political economy debates on structural dependency and developmental asymmetries within the EU periphery.

Chapters 10 and 11 examine the international movement of capital and labour—two critical dimensions of Bulgaria's external economic profile. Chapter 10 analyses the structure of foreign direct investment, highlighting its concentration in low-cost, efficiency-seeking sectors with limited spillovers for domestic upgrading. Chapter 11 turns to labour mobility, focusing on emigration, remittances, and the long-term implications of human capital outflows. While outward migration has supported household incomes and external balances, it has also intensified demographic pressures. Together, these chapters reveal the structural vulnerabilities linked to Bulgaria's reliance on mobile production factors without a corresponding strategy for endogenous development.

The latter chapters – particularly those on digital transformation (Chapter 12) and green transition (Chapter 13) – provide a forward-looking perspective. Zhelev evaluates Bulgaria's preparedness for the dual transitions currently shaping European economies: digitalization and decarbonization. His conclusion is cautious but not pessimistic; while structural and institutional deficits remain, strategic investments in technology, skills, and innovation ecosystems could enable Bulgaria to reposition itself more favorably in the next phase of global economic restructuring.

One of the book's key strengths lies in its interdisciplinary approach, blending economic analysis with institutional, geopolitical, and historical insights. The writing is clear and accessible, supported by extensive citations and data visualizations. The work is also remarkably timely, as it contributes to contemporary policy debates, including the EU industrial strategy, supply chain resilience, and the role of small states in an increasingly fragmented global economy.

That said, a more explicit comparative dimension – perhaps drawing on examples from other Southeast European countries – could have further enhanced the book's generalizability. But the book serves as an important case study relevan for all countries in the region of Southeast East Europe. Although the analysis implicitly engages with themes of dependency and upgrading, it stops short of fully embedding these within established theoretical frameworks such as dependent market economies or the middle-income trap. Nevertheless, the depth of empirical evidence and the clarity of the author's arguments more than compensate for these limitations.

The book "Bulgaria in the Global Economy" presents a comprehensive and carefully documented portrait of a country navigating twenty-first-century globalization. It is a valuable and original contribution to the literature on small-state economic development, EU integration, and international political economy. Its insights hold relevance for a broader class of emerging economies facing the dual pressures of structural adjustment and global repositioning. University libraries across the region will find it a worthwhile addition, as a supplementary literature for students and instructors

can readily assign individual chapters in courses related to international economics and European integration.

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Medzinárodné vzťahy sú interdisciplinárny vedecký časopis pre medzinárodné politické, ekonomické, kultúrne a právne vzťahy Fakulty medzinárodných vzťahov Ekonomickej univerzity v Bratislave. Vychádza dvakrát ročne, v marci a v septembri. Uzávierky jednotlivých čísiel sú každoročne 15.9 a 15.3. Všetky príspevky sú pri zachovaní obojstrannej anonymity recenzované minimálne dvomi oponentmi.

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