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The impact of loan accessibility on household welfare: An empirical analysis in Lesotho

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Abstract

This paper examines the effects of credit access on household spending, using data from the 2021 Finaccess household survey in Lesotho. Data from 2,999 households was analyzed, 1,805 of which had access to credit and 1,194 did not. Using propensity score matching (PSM), the average treatment effect was estimated to understand the impact of access to credit on essential household expenditures, including food, transportation, health, clothing, education, income, and rent. Inverse probability weighting regression adjustment (IPWRA) and Mahalanobis distance matching (MDM) were also used to minimize biases and address confounding. The findings reveal that spending in all categories tends to significantly increase for households with access to credit. These findings emphasize that credit access promotes household welfare, thereby highlighting the importance of loan acquisitions and urging stakeholders and policymakers to improve financial literacy.

Keywords: Access to credit, Household expenditures, Propensity Score Matching, Lesotho
Jel codes: I31

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1. Introduction

Access to credit is a fundamental driver of economic development, enabling households to manage financial risks, invest in productive ventures, and improve overall welfare (Islam, 2016). In developing economies like Lesotho, financial exclusion remains a significant barrier to poverty reduction, as many households lack access to formal credit institutions and rely on informal lending mechanisms (FinScope Lesotho, 2021). The availability of credit has been linked to increased household consumption, improved health and education outcomes, and greater resilience to economic shocks (Kaboski & Townsend, 2012). However, despite these potential benefits, concerns persist about over-indebtedness, high borrowing costs, and the long-term sustainability of credit-driven welfare improvements (Khandker et al., 2010). Existing research in developing countries has shown that credit access can positively influence household expenditures, particularly in essential categories such as food, healthcare, and education (Quang et al., 2023). Additionall, access to loans is essential for alleviating poverty and boosting household income (Bukari et al. 2021; Manzilati et al. 2022). However, the impact of credit on household spending patterns in Lesotho remains underexplored. While microfinance institutions (MFIs) and commercial banks have expanded their reach in recent years, empirical studies on whether increased financial inclusion translates into meaningful improvements in household welfare are scarce. This study aims to bridge this gap by examining the effect of credit access on household expenditures in Lesotho, using data from the 2021 FinAccess Household Survey. To establish causality, this study employs propensity score matching (PSM) along with robustness checks using inverse probability weighting regression adjustment (IPWRA) and Mahalanobis distance matching (MDM). These methodologies allow for a more precise estimation of the effects of credit access by accounting for selection bias and confounding variables. By analyzing key expenditure categories including food, healthcare, education, and housing this research provides insights into how credit access influences household decision-making.

The findings will inform policymakers and financial institutions on the effectiveness of credit programs in improving household welfare and guide efforts to promote responsible financial inclusion in Lesotho. The remainder of this paper is structured as follows: Section 2 provides a contextual background, Section 3 summarizes the literature review, Section 4 highlights materials and methods, Section 5 discusses the findings and discussion, and Section 6 concludes.

2. Background

The role of credit in economic development has been widely recognized in economic theory. The permanent income hypothesis (Friedman, 1957) suggests that households borrow to smooth consumption over time, maintaining stable expenditure patterns even when income fluctuates. This theory posits that individuals make financial decisions based on their expected lifetime earnings rather than current income, meaning that access to credit allows them to maintain consistent consumption levels despite short-term income shocks. Similarly, the life-cycle hypothesis (Modigliani & Brumberg, 1954) posits that individuals make borrowing and saving decisions based on expected lifetime earnings, borrowing when income is low, saving when income is stable, and dis-saving during retirement. Implying that credit access enables households to invest in human capital, housing, and productive assets. Conversely, the credit rationing theory (Stiglitz & Weiss, 1981) provides another perspective, arguing that due to imperfect information, financial institutions may limit credit supply to certain borrowers, particularly low-income households. This theory highlights the structural barriers to credit access in developing economies like Lesotho, where formal financial institutions may be reluctant to lend due to high default risks. As a result, many households turn to informal credit sources, often at exorbitant interest rates, which can undermine the potential benefits of borrowing.

Empirical evidence from developing countries highlights the transformative effects of credit access on household welfare. Studies in Ghana (Ampah et al., 2017) and Nigeria (Ozoh et al., 2022) indicate that access to loans enables households to enhance food security, invest in children's education, and improve healthcare access. These findings suggest that financial inclusion enhances economic stability by reducing liquidity constraints and enabling investment in productive assets. However, research also warns of the risks associated with over-indebtedness, which can lead to financial distress and reduced

long-term welfare if credit is not managed responsibly (Islam, 2016). In the context of Lesotho, financial landscape is characterized by low levels of financial inclusion, with many rural households relying on informal lending mechanisms (FinScope Lesotho, 2021). Due to high poverty rates of approximately 27.3% coupled with vulnerability to external economic changes, it is essential to explore how credit can mitigate household challenges (Boko et al., 2023). This understanding is crucial for shaping policies addressing poverty alleviation and sustainable development in Lesotho. Microfinance institutions (MFIs) have consistently broadened their credit offerings, particularly emphasizing short-term loans that can be repaid within one year. The Finscope (2021) report highlighted an impressive 8.5% rise in loan access in Lesotho, amounting to a total of 1.1 billion Lesotho Loti (LSL). While the expansion of microfinance institutions has improved financial access, the extent to which this has translated into better economic outcomes for households remains unclear. By assessing the impact of credit access on household expenditures in Lesotho, this study seeks to contribute to the growing literature on financial inclusion and its role in poverty alleviation including whether credit access translates into meaningful improvements in household expenditure.

3. Literature review

The impact of credit access on household welfare has been widely studied across different economic contexts. Research from countries with similar socio-economic structures to Lesotho, such as Eswatini, Botswana, and South Africa, provides valuable insights into the cultural and structural factors influencing financial access in the region.

Studies in the West African Economic and Monetary Union (WAEMU) and the Southern African Development Community (SADC) reveal that traditional lending practices still play a dominant role in rural areas where formal financial institutions are scarce and costly (Shirono et al., 2024). The reliance on informal credit mechanisms, including loan sharks and community savings groups, often results in high borrowing costs and cyclical debt, limiting the potential benefits of financial access. Similar patterns have been observed in Lesotho, where financial exclusion is exacerbated by geographic isolation and limited banking infrastructure (FinScope Lesotho, 2021). These observed patterns are in the credit rationing theory that explains why disparities in credit access persist, particularly among low-income households.

In South Africa, where financial inclusion is more advanced, research shows that access to microfinance has led to increased household consumption and investment in small enterprises (Banerjee et al., 2015). These findings support the permanent income hypothesis and life-cycle hypothesis which suggest that access to credit enable consumption smoothing and strategic investment. However, concerns about over-indebtedness and high-interest rates remain prevalent, particularly among low-income borrowers (Karlan & Zinman, 2011). These findings highlight the importance of responsible lending practices and financial literacy programs to ensure that credit access translates into long-term welfare improvements. Cultural factors also play a critical role in shaping financial behaviours in Lesotho. The country's strong reliance on remittances from migrant workers in South Africa affects household borrowing patterns, as many families use credit to smooth consumption rather than for investment purposes (Crush et al., 2017). This differs from credit usage in countries like Kenya and Tanzania, where microfinance programs have been more successful in promoting entrepreneurial activities and income generation (Morduch, 1999). Similar results have been observed in Malawi, where access to credit has improved agricultural investments and food security, although repayment constraints remain a challenge (Makuluni & Dunga, 2022).

In Nigeria, Ozoh et al. (2022) found that access to credit significantly improves household welfare, yet financial exclusion remains high due to stringent lending requirements and high-interest rates from formal financial institutions. Likewise, research in Ethiopia by Bocher et al. (2017) demonstrated that access to microcredit boosts consumption expenditures and improves food security, aligning with findings from Ghana where credit access plays a crucial role in reducing poverty levels (Ampah et al., 2017). However, in some cases, financial constraints and lack of collateral continue to exclude vulnerable populations from formal lending opportunities.

In Vietnam, studies by Quach (2017) and Quang et al. (2023) found that access to credit significantly boosts household income, stimulates consumption, and enhances spending on education and healthcare.

Similarly, research in Indonesia by Santoso (2016) revealed that access to credit positively influences household spending behaviour, particularly in rural areas where formal banking structures remain underdeveloped. These findings suggest that credit programs tailored to rural populations can be effective in improving economic stability. Additionally, Moahid et al. (2023) examined the effects of agricultural credit in Bangladesh, showing that disaster-affected farming households with access to credit had higher expenditure on farm inputs and improved resilience. Their study underscores the importance of targeted credit programs, especially in vulnerable communities where financial shocks can severely impact livelihoods. Structural barriers such as high transaction costs, lack of collateral, and stringent lending requirements further restrict financial access in Lesotho (Chisasa, 2022). These constraints discourage low-income households from participating in the formal credit market, reinforcing dependence on informal lending mechanisms. Addressing these challenges requires targeted policy interventions, including the expansion of digital financial services, improved access to credit for rural communities, and enhanced consumer protection regulations.

Beyond Africa, studies from Asia, Europe, and the Americas provide additional perspectives on how financial systems influence household welfare. Research in Bangladesh and India highlights how microfinance institutions (MFIs) have played a crucial role in improving household welfare, particularly among women entrepreneurs (Khandker, 2005; Banerjee et al., 2019). In Bangladesh, access to small loans has been shown to boost income generating activities and expenditures, particularly in rural areas where traditional banking services are limited (Pomi, 2019). Similarly, in India, micro programs have helped reduce poverty and improve income stability, but challenges related to high interest rates and repayment burdens persist (Burgess & Pande, 2005). In Latin America, research in Mexico and Brazil indicates that expanding access to formal credit has led to improved consumption and investment in education and healthcare (Bruhn & Love, 2014; Café, 2023). In developed economies such as the United States and the United Kingdom, credit access is more widespread due to strong financial infrastructure and well-regulated lending markets. However, disparities persist, as lower-income households often face higher borrowing costs and discriminatory lending practices, limiting their ability to benefit from financial services (Bhutta & Hizmo, 2022). The findings further reinforce the credit rationing theory that imperfect information and income-level plays a role in accessing credit. These global perspectives highlight that while credit access generally leads to improved welfare, its effectiveness depends on broader economic conditions, financial literacy, and regulatory frameworks. This study contributes to the literature by providing an in-depth analysis of credit access and household expenditures in Lesotho, incorporating regional comparisons to contextualize its findings. Its importance is evident in four key areas: it offers insights for policymakers to improve formal credit access and financial literacy to combat Lesotho's low levels of financial inclusion. Additionally, it builds upon economic theories regarding consumption smoothing and credit constraints by examining household expenditures in a credit-restricted environment. Using advanced econometric techniques (PSM, IPW, MDM), the study strengthens causal inference and lays the groundwork for future investigations. This study forms a solid base for future initiatives to boost financial inclusion and improve household welfare.

4. Materials and Methods

4.1. Objectives

This study aims to assess whether access to credit influences household spending in Lesotho.

Specific objectives:

1. To investigate how access to credit effects expenditure on food, transportation, health, clothing, education, and rent.

4.2. Sample size and Area

Lesotho was selected because of its low financial inclusion, significant dependence on informal lending, economic fragility, high unemployment, and reliance on remittances. The study analyzed cross-sectional data from 2,999 households. The data was sourced from Lesotho's nationwide 2021 Finaccess household survey. The survey revealed that 1,805 households had access to loans or credit, compared to 1,194 households without credit access. This distribution of credit access was not random, suggesting that self-selection biases could influence comparisons between the two groups.

4.3. Research Hypothesis

Based on economic theory and empirical findings on credit access and household spending, we propose the following hypothesis:

Hypothesis 1: Credit access increases household spending on essential goods and services. The Permanent Income Hypothesis (Friedman, 1957) and Life-Cycle Hypothesis (Modigliani & Brumberg, 1954) suggest that households use credit to smooth consumption over time, leading to increased expenditures on necessities. Empirical studies (Khandker & Samad, 2014; Beck et al., 2009) have shown that microcredit programs enhance spending on food, health, and education while reducing poverty.

Hypothesis 2: Credit access enables investment in productive activities, increasing household income. The Credit Rationing Theory (Stiglitz & Weiss, 1981) highlights how access to credit can enable households to invest in businesses and income-generating activities. Studies by Banerjee & Duflo (2014) and Dupas & Robinson (2013) show that access to financial services supports small business growth and financial stability.

Hypothesis 3: The impact of credit access on household spending varies based on income levels. Research suggests that middle-income households benefit more from credit due to financial literacy, risk tolerance, and borrowing constraints (Zeller & Sharma, 2000; Cole, Sampson, & Zia, 2011).

4.4. Identification strategy

This study employs a robust econometric approach to evaluate the impact of credit access on household welfare in Lesotho. The analysis relies on three key matching techniques: Propensity Score Matching (PSM), Inverse Probability Weighting Regression Adjustment (IPWRA), and Mahalanobis Distance Matching (MDM). These methods are chosen to address potential selection bias and ensure a more accurate estimation of the causal effects of credit access on household expenditures and income.

PSM computes the likelihood of receiving treatment (such as credit access) based on observed characteristics, pairing households with similar propensity scores. This method assumes the selection of observable characteristics. Matching methods aim to replicate randomization in treatment assignment by pairing treated individuals with untreated individuals who share similar characteristics before treatment. Allowing for the estimation of the unobserved counterfactual dependent variable. Inverse Probability Weighting (IPW) assigns weights to observations according to their treatment probability. Regression Adjustment (RA) applies regression techniques to address remaining covariate imbalances. MDM pairs treated and control units by calculating the multivariate distance (e.g., Mahalanobis distance) between their covariates. . The equation is as follows:

$$ATET(x) = E[Y_1|D = 1, X = x] - E[Y_0|D = 0, X = x] \dots\dots\dots\dots\dots\dots 1)$$

In the given scenario, Y denotes expenditures. Meanwhile, X represents the set of pre-treatment covariates, and D is the treatment dummy variable that characterizes a household's access to loans. D=1 means that a household has access to credit, and D=0 means it does not. $E[Y_1|D = 1, X = x]$ refers to the expenditure of the treated. $E[Y_0|D = 0, X = x]$ is the expected expenditure of the best match untreated.

In the PSM model, it is assumed that after matching based on pre-treatment covariates, there are no systematic differences between the treated and untreated groups. The model below is used to estimate average treatment Effects (ATET) under the propensity score P(x)P(x):

$$ATET = E[Y_1|D = 1,\ P(x)] - E[Y_0|D = 0,\ P(x)] \dots\dots\dots\dots\dots.. (2)$$

Table 1 details the variables considered in this study. The dependent variables include expenditures on transport, food, health, clothing, education, rent, and household income, whereas access to credit is the independent variable. Furthermore, demographic and socioeconomic factors including age, education level, household size, gender marital status, and area of residence are included as covariates. A binary variable is utilized, where 1 indicates that the household has access to credit and 0 indicates no access. The respondent's age is measured in years, while household size refers to the total number of individuals. The variable Gender is represented by a dummy variable where 1 denotes female and 0 denotes male, reflecting the gender of the household head. Another dummy variable, Educated, indicates whether the

household head has completed primary school or higher (1 = educated) or is uneducated (0). Additionally, the Single variable indicates marital status, with 1 representing single and 0 for all other statuses. Lastly, the Rural variable classifies the household's location as rural (1 = rural) or urban (0 = urban**).**

4.4.1. Assumptions of Matching Methods

Matching methods rely on key assumptions to ensure unbiased estimates of the treatment effect:

Conditional Independence Assumption (CIA)

Access to credit is not random, which means that comparisons between individuals with access and those without access may be influenced by self-selection. To address this potential selection bias, we utilize the Propensity Score Matching (PSM) method, which pairs treated individuals (those with access to mobile money) with untreated individuals (those without access) who have similar pre-treatment characteristics (Bari et al., 2024; West et al., 2014). The PSM method assumes conditional independence (CIA), indicating that after controlling for pre-treatment covariates (i.e., X), the treatment assignment (credit access) is effectively random. This assumption enables us to estimate treatment effects by comparing outcomes between matched individuals who possess similar characteristics, regardless of their credit access.

Common Support (Overlap Condition)

There must be a sufficient number of similar households in both treatment and control groups. The matching process may fail if households with credit access differ significantly from those without.

No Hidden Bias

Matching assumes that all relevant factors influencing credit access and outcomes are observable in the data. The results may be biased if missing important variables (e.g., risk-taking behaviour).

Advantages

PSM reduces selection bias by balancing treatment and control groups. It is easy to implement and interpret and works well when there is a significant overlap between the treated and control groups. IPWRA estimates remain unbiased if the propensity score or outcome regression model is correctly specified. It is more efficient than PSM when covariates influence treatment selection and outcomes. MDM uses all covariates directly rather than summarizing them into a single score (like PSM). It works well when sample sizes are small.

Limitations

This only accounts for observed covariates; unobserved factors may bias the results. The choice of matching algorithm (nearest neighbor, kernel matching) affects the results. Dropping unmatched observations may reduce sample size and efficiency. IPWRA is sensitive to misspecification of the regression model and requires careful choice of functional form for regression. MDM becomes computationally expensive as the number of covariates increases. Assumes covariates have similar distributions in both groups, which may not always be accurate.

Table 1: Outcome Variables and Covariates

Variables	**Description**
Outcome variables	
Food expenditure	(Amount of food expenses)
Transport expenditure	(Amount of transport expenditure)
Household income	(Household income)
Health expenditure	(Amount of health expenditure)
Clothing expenditure	(Amount of closing expenditure)

Education expenditure	(Amount of education expenditure)
Rent Expenditure	(Amount of rent expenditure)
Independent variable	
Access to Credit	=1 if a household has access to credit and =0 if no access to credit
Covariates	
Hhage (years)	Age of the respondent
HHsize	Household size
Female	Dummy (1= female and 0 =male)
Educated	Dummy (1=primary school and above and 0 =not educated
Single	Dummy (1= single and 0 =otherwise)
Rural	Dummy for the area (1=Rural and 0 =Urban)

The choice of variables included in this study was informed by economic theory as well as existing literature related to household welfare and financial inclusion. The variables quantify household welfare and consumption trends, essential financial security indicators, and living standards. Food security significantly contributes to household well-being, for instance, heightened food spending points to enhanced nutrition and improved living conditions. Access to credit may enable households to invest in transportation for work, education, or business pursuits. Income serves as a crucial factor in household welfare. Access to credit can help households boost their income through investments in entrepreneurial ventures or productive resources. Financial access may enhance healthcare use, allowing households to allocate more towards medical expenses. This aspect of spending, deemed non-essential, can signify financial stability. Households with credit access may allocate more funds to education, fostering long-term human capital development. Better financial stability can improve housing conditions, as households with credit access tend to spend more on rent or renovations. Credit access is pivotal in financial inclusion, permitting households to stabilize consumption, invest in productive efforts, and navigate financial setbacks. This variable is crucial for evaluating the causal relationship between credit access and household spending. These considerations are included to control for confounding variables affecting the association between credit access and household expenditures. Older individuals may exhibit different spending habits, credit access, or financial behaviours than their younger counterparts. Households with more members generally have elevated expenditures, and controlling for this factor is essential to discern the impact of credit access. Women's spending priorities often vary, especially in areas like education and food security, with gender also influencing credit access. More educated individuals typically excel in credit management and investment decision-making. Additionally, single households may display distinct financial behaviours compared to married ones, while rural and urban households experience varied access to financial services and different spending patterns.

5. Results and discussion

5.1. Summary statistics

The treatment group has an average transport expenditure of 184.72 LSL (10.21$ $), compared to 113.98 LSL (6.30$) for the control group, indicating that the treatment group spends 70.74 LSL (3.91$) more on transport. The treatment group spent 644.12 LSL (35.61$) on food, compared to 470.19 LSL (26$) for the control group, reflecting a difference of 173.93 LSL (9.62$). The average income of the treatment group is 2324.87 LSL (128.53$), while the control group averages 1420.33 LSL (78.53$), resulting in the treatment group earning 904.54 LSL (50.01$) more. For health expenses, the treatment group spent 100.04 LSL (5.53$) versus 71.41 LSL (3.95$) for the control group, a difference of 28.63 LSL (1.58$). For clothing, the treatment group's expenditure of 54.47 LSL (3.01$) significantly exceeds the control group's 15.90 LSL (0.88$), an increase of 38.57 LSL (2.13$). The treatment group spent 86.71 LSL (4.79$) on education, whereas the control group spent 32.46 LSL (1.79$), indicating a difference of 54.25 LSL (3$). The average rent is 131.73 LSL (7.28$) for the treatment group and 64.54

LSL (3.57$) for the control group. Regarding rural residency, 59% of the treatment group lives in rural areas compared to 63% in the control group, indicating the treatment group is less rural. The average age of household heads in the treatment group is 49.68 and 51.21 in the control group, with the treatment group's heads being 1.53 years younger on average. Additionally, treatment group household size averages 4.07 members while the control group averages 3.86. The proportion of female household heads is 41% in the treatment group and 40% in the control group. 86% of the treatment group household heads are educated, while 87% in the control group suggests, indicating slightly higher education among the control group. Lastly, 15% of the household heads in the treatment group are single, while 22% of the control group are single. Notably, the treatment group, which had access to credit enjoyed a significantly higher household income. Specifically, 904.54 LSL more than the control group. Throughout all expenses (transport, food, health, clothing, education, and rent), the treatment group consistently spends more than the control group, suggesting that access to credit may enable households to enhance their spending on fundamental needs, thereby improving their living standards.

Table 2: Summary Statistics

Variables	Treatment group	Control group	Difference
Treatment variable			
Access to credit	1	0	
Outcomes variable			
Transport Expenditure	184.72	113.98	70.74
Food Expenditure	644.12	470.19	173.93
Household income	2324.87	1420.33	904.54
Health Expenditure	100.04	71.41	28.63
Closing Expenditure	54.47	15.90	38.57
Education Expenditure	86.71	32.46	54.25
Rent Expenditure	131.73	64.54	67.19
Covariates			
Rural	.59	.63	-0.04
Hhage	49.68	51.21	-1,53
Hhsize	4.07	3.86	0,21
Female	.41	.40	0.01
Educatwed	.86	.87	-0.01
Single	.15	.22	-0.07
Observations	1,805	1,194	2,999

5.2. Main results

The findings of table 3 show that obtaining credit significantly boosts spending and income in various household categories. Different matching techniques, including Nearest Neighbor Matching, Caliper Matching, and Kernel Matching, consistently reveal marked expense increases across all categories. This evidence indicates that access to credit improves household expenditures and income on essential needs, resulting in better living standards. The uniformity of results across these methods reinforces the reliability of these findings.

Table 3:Impact of access to credit on expenditures

Outcomes Variable	Nearest neighbor Matching	Caliper Matching	Kernel Matching
Transport Expenditure	63.75***	66.56***	66.59***
Food Expenditure	150.27***	157.02***	157.04***
Household income	816.52***	850.97***	851.26***
Health Expenditure	28.87***	28.56***	28.56***
Closing Expenditure	36.68***	37.68***	37.68***
Education Expenditure	50.88***	52.06***	52.06***
Rent Expenditure	57.35***	63.01***	63.03***

The findings from the IPWRA and MDM estimations reinforce the beneficial effects of credit access on household spending in multiple areas. Households with credit access demonstrate significantly higher transportation expenditures, increasing by 64.39 LSL (IPWRA) and 56.28 LSL (MDM). Both approaches indicate a substantial positive effect, likely enhancing mobility and service access. Spending on food rises by 157.33 LSL (IPWRA) and 157.98 LSL (MDM), indicating that credit access allows households to invest more in food, possibly alleviating food insecurity. Additionally, credit access boosts household income by 844.77 LSL (IPWRA) and 785.08 LSL (MDM), which supports the idea that credit facilitates income generation and financial security. Health-related spending grows by 27.21 LSL (IPWRA) and 25.37 LSL (MDM), suggesting that credit access enables households to manage healthcare costs better, potentially leading to improved health outcomes. Clothing expenditures also increase, by 38.09 LSL (IPWRA) and 38.40

LSL (MDM), indicating a heightened ability to satisfy basic needs. There is a notable disparity in education spending between methods, with IPWRA showing an increase of 51.78 LSL, while MDM reports an increase by 36.64 LSL. This discrepancy suggests that although both methods indicate a positive effect, the magnitude of their estimates differs, which could reflect methodological variations. Rent expenditures rise by 60.62 LSL (IPWRA) and 43.91 LSL (MDM), indicating that credit access may support housing stability or quality. Overall, both IPWRA and MDM results reaffirm that credit access significantly improves household spending on necessary categories. The minor differences between the two methods indicate variations in estimation sensitivity; however, the consistently positive impact highlights the critical role of credit in enhancing household welfare.

Table 4:Inverse Probability weighting regression adjustment estimation

Outcomes variable	IPWRA estimation	MDM estimation
Transport Expenditure	64.39***	56.28***
Food Expenditure	157.33***	157.98***
Household income	844.77***	785.08***
Health Expenditure	27.21***	25.37***
Closing Expenditure	38.09***	38.40***
Education Expenditure	51.78***	36.64***
Rent Expenditure	60.62***	43.91***

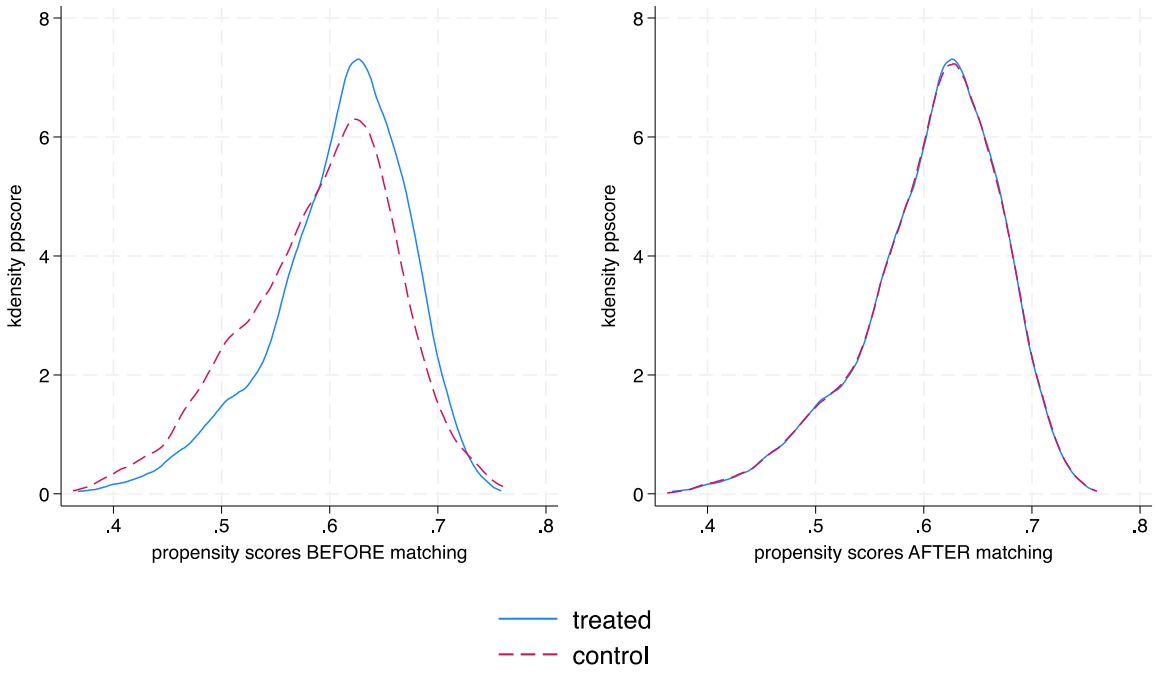

Figure 1:Distribution of Covariates before and after matching

Both estimation methods (IPWRA and MDM) are consistent with the PSM method. The two techniques indicate that access to credit significantly increases household expenditure and income.

5.3. Balance check

Balancing the covariates in propensity score matching (PSM) is essential for accurately estimating the impact. The matching process successfully equalized the covariates between the two groups. Any significant biases present before matching were significantly reduced, as evidenced by the substantial decrease in bias percentages and the non-significant p-values after matching. The results indicate that the treatment and control groups are now more comparable, improving the validity of the subsequent analyses.

Table 5: Covariates Balance Check

	Mean			
	Before matching	**Treated**	**Control**	Bias reduction (%)	**P-value**
Female		.41	.40		0.000
Educated		.86	.87		0.000
Single		.15	.22		0.000
HHsize		4.07	3.86		0.011
Rural		.59	.63		0.078
HHage		49.68	51.21		0.017
After matching					
Female		.41	.41	44.3	0.561
Educated		.86	.86	91.2	0.938
Single		.15	.14	84.1	0.340

HHsize	4.07	3.86	96.9	0.886
Rural	.59	.60	70.6	0.951
HHage	49.68	50.13	95.0	0.426

Before matching, Key characteristics like marital status, household size, and the age of the household head varied significantly between the treated and control groups. Unadjusted, these discrepancies could result in biased estimates of the intervention's impact. After matching: The matching procedure successfully balanced almost all characteristics among the treated and control groups. All p-values post-matching exceed 0.05, which reveals no significant differences between the groups. Additionally, the bias reduction percentages are notably high, particularly for household size (96.9%), household head age (95%), and education (91.2%).

5.4. Discussion

This study demonstrates the significant impact of credit accessibility on household welfare in Lesotho, leading to notable increases in household expenditures and income. Using econometric methods such as Propensity Score Matching (PSM), Inverse Probability Weighting Regression Adjustment (IPWRA), and Mahalanobis Distance Matching (MDM), the findings reveal that households benefiting from credit access allocate more resources to food and other essential needs, potentially enhancing food security. These results align with Bidisha et al. (2017), who found similar positive effects of credit on household expenditures in Bangladesh. Furthermore, our findings support the conclusions of Tonch (2020), where access to credit led to increased household income, reinforcing the role of financial inclusion in improving economic stability.

From a theoretical perspective, this study aligns with the permanent income hypothesis, which posits that access to credit facilitates resource allocation and investment, leading to economic growth and improved welfare. By enabling households to smooth consumption and invest in productive activities, credit access fosters long-term financial stability. Additionally, our findings confirm the life-cycle hypothesis which suggests that households optimize consumption over time, using credit as a means to manage temporary income fluctuations by demonstrating increased expenditures among credit users, reinforcing the notion that access to financial resources allows households to sustain a higher standard of living. Comparing these results with other literature, the study's findings partially align with those of Ikwuagwu et al. (2024), who explored foreign remittances' effects on economic growth in Nigeria. Although their study found a positive influence, it was not statistically significant, highlighting potential variations in financial interventions' effectiveness. Similarly, Oke and Adamson (2023) found that financial inclusion for MSMEs in Nigeria was hindered by high interest rates and inadequate infrastructure, which contrasts with our study, where increased access to credit correlated positively with household welfare. This divergence suggests that while financial inclusion is broadly beneficial, contextual factors such as interest rates, financial infrastructure, and borrower financial literacy play critical roles in determining its overall impact. Moreover, Benchenna and Korichi (2023) highlight the importance of credit risk management in maintaining bank profitability, suggesting that well-regulated financial institutions contribute to sustainable lending practices. The necessity of transparent and efficient credit allocation is further emphasized by Civelek et al. (2018), who found that SMEs face considerable financing barriers due to high collateral requirements and interest rate uncertainties. While our study focuses on household credit access rather than SME financing, both findings underscore the significance of structured credit systems in fostering economic resilience. Jankovic (2017) further supports this perspective, arguing that microfinance tends to emerge in regions with high poverty and low economic development, reinforcing the role of credit in alleviating financial constraints.

These insights contribute to a broader understanding of how financial inclusion initiatives can influence economic stability. While our study supports the notion that credit access enhances welfare by enabling households to meet essential needs, the potential risks of over-indebtedness necessitate complementary policies such as financial literacy programs and consumer protection regulations.

6. Conclusion

Drawing on data from the 2021 FinAccess Household Survey in Lesotho, this study explored how credit access affects household spending and income. The results indicate that households with access to credit allocate more resources to essential goods and services, leading to improved living standards. These findings underscore the role of financial inclusion in enhancing welfare, reducing poverty, and promoting economic resilience in developing countries.

To maximize the benefits of credit access while mitigating risks, policymakers should prioritize financial inclusion strategies that address existing barriers. Specifically, reducing collateral requirements and offering subsidized interest rates for low-income households could enhance accessibility. Furthermore, establishing transparent lending practices and monitoring informal credit markets would safeguard borrowers against predatory lending. Financial institutions must also play an active role in tailoring loan products to meet diverse household needs, such as emergency financing, agricultural loans, and small business credit. Expanding mobile banking and digital credit services could further improve accessibility, particularly in rural areas, while reducing operational costs for lenders. Promoting savings-linked loan programs may also help households build financial resilience and reduce dependence on high-interest credit. In addition, educational initiatives on financial management should be integrated into credit programs to ensure that borrowers use loans efficiently and sustainably. Training and mentorship can empower households to leverage credit for income-generating activities, thereby reinforcing economic stability. Collaboration between NGOs, international donors, and local governments can further facilitate microcredit initiatives that extend financial services to underserved regions.

Future research should focus on assessing the sustainability of credit access effects using more robust methodologies, such as randomized controlled trials (RCTs) and instrumental variable approaches. Understanding the long-term impact of financial inclusion policies will be critical in shaping effective economic development strategies. By incorporating these targeted policy measures, this study contributes to the ongoing discourse on financial inclusion, providing actionable insights that extend beyond academic discussions into practical financial sector reforms aimed at fostering household welfare and economic stability.

Declaration of generative AI and AI-assisted technologies in the writing process

While preparing this work, the authors used ChatGPT to improve the grammatical language and readability of the paper. After using this tool/service, the authors reviewed and edited the content as needed and took full responsibility for the publication's content.

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Data availability

The data used and analyzed during this study is available from the corresponding author upon request.

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Disclosure statement

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References

Ampah, S. N., Ambrose, J. O., Omagwa, J. O., & Frimpong, S. (2017). Effect of access to credit and financial services on poverty reduction in the central region of Ghana. *International Journal of Business and Social Science*, *8*(8), 49-60.

Bari, M. A., Khan, G. D., Khuram, M. A., Islam, Md. J., & Yoshida, Y. (2024). Financial inclusion and expenditure patterns: Insights from slum households in Bangladesh. *Cogent Economics & Finance*, 12(1).

Bhutta, N., & Hizmo, A. (2022). Do minorities pay more for mortgages? *The Review of Financial Studies, 35*(4), 1597-1641. https://doi.org/10.1093/rfs/hhab042

Bidisha, S. H., Khan, A., Imran, K., Khondker, B. H., & Suhrawardy, G. M. (2017). Role of credit in food security and dietary diversity in Bangladesh. *Economic Analysis and Policy*, *53*, 33-45.

Bocher, T. F., Alemu, B. A., & Kelbore, Z. G. (2017). Does access to credit improve household welfare? Evidence from Ethiopia using endogenous regime switching regression. *African Journal of Economic and Management Studies*, *8*(1), 51-65.

Boko, J., Raju, D., & Younger, S. D. (2023). Government social protection programme spending and household welfare in Lesotho. *South African Journal of Economics*, *91*(3), 375-393.

Bruhn, M., & Love, I. (2014). The Real Impact of Improved Access to Finance: Evidence from Mexico. *The Journal of Finance*, *69*(3), 1347–1376. http://www.jstor.org/stable/43611187

Bukari, C., Peprah, J. A., Ayifah, R. N. Y., & Annim, S. K. (2021). Effects of credit 'plus' on poverty reduction in Ghana. *The Journal of Development Studies*, *57*(2), 343-360.

Burgess, R. and Pande, R. (2005) Can Rural Banks Reduce Poverty? Evidence from the Indian Social Banking Experiment. American Economic Review, 95, 780-795. https://doi.org/10.1257/0002828054201242

Café, R. M. (2023). Access to credit and quality of expenditure: evidence from Brazilian municipalities. *Cadernos de Finanças Públicas*, *23*(1).

Choudhury, H. A., Das, A., & Rahman, A. (2017). The effectiveness of micro-credit programmes focusing on household income, expenditure and savings: Evidence from Bangladesh. *Journal of Competitiveness*.

Crush, Jonathan & Dodson, Belinda & Williams, Vincent & Tevera, Daniel. (2017). Harnessing Migration for Inclusive Growth and Development in Southern Africa. 10.2307/j.ctvh8r3q1.

Dagnew, D. K., & Kaur, R. (2016). The impact of microfinance on household expenditure patterns: Evidence from Amhara Credit and Saving Institution, Ethiopia. *International Journal in Management & Social Science*, *4*(1), 88-97.

FinScope Lesotho 2021 report.

Friedman, M. (1957). *A theory of the consumption function.* Princeton University Press.

Islam, T. (2016). *Microcredit and poverty alleviation*. Routledge.

Kaboski, J. P., & Townsend, R. M. (2012). The impact of credit on village economies. *American Economic Journal: Applied Economics*, *4*(2), 98-133.

Karlan, D., & Zinman, J. (2011). Microcredit in theory and practice: using randomized credit scoring for impact evaluation. *Science (New York, N.Y.)*, *332*(6035), 1278–1284. https://doi.org/10.1126/science.1200138.

Khandker, S. R., Koolwal, G. B., & Samad, H. A. (2010). *Handbook on impact evaluation: Quantitative methods and practices.* World Bank.

Kumar, A., Mishra, A. K., Sonkar, V. K., & Saroj, S. (2020). Access to Credit and Economic Well-Being of Rural Households. *Journal of Agricultural and Resource Economics*, *45*(1), 145-160.

Makuluni, F. E., & Dunga, H. M. (2022). The impact of access to credit on welfare inequality in Malawi. *Studia Universitatis Babes-Bolyai Oeconomica*, *67*(2), 50-66.

Manzilati, A., Kornitasari, Y., Suprayogi, S., & Efani, A. (2022). Analysis Of Factors Affecting Credit Access And Their Impact On Welfare. In *Journal of International Conference Proceedings* (Vol. 5, No. 4, pp. 405-414).

Moahid, M., Khan, G.D., Bari, M.D.A. and Yoshida, Y. (2023), "Does access to agricultural credit help disaster-affected farming households to invest more on agricultural input?", *Agricultural Finance Review*, Vol. 83 No. 1, pp. 96-106.

Modigliani, F., & Brumberg, R. H. (1954). Utility analysis and the consumption function: An interpretation of cross-section data. In K. K. Kurihara (Ed.), *Post-Keynesian economics* (pp. 388-436). Rutgers University Press

Morduch, Jonathan. 1999. "The Microfinance Promise." *Journal of Economic Literature* 37 (4): 1569–1614**.**DOI: 10.1257/jel.37.4.1569

Ozoh, J. N., Nwogwugwu, U. C., Nwokoye, E. S., & Metu, G. (2022). Impact of access to credit on household welfare in Nigeria. *International Journal of Management Studies and Social Science Research*, *4*(2), 187-198.

Pomi, S. S. (2019). Impact of microcredit on rural poverty alleviation in the context of Bangladesh. *International Journal of Economics and Finance*, *11*(6), 1-70.

Quach, H. M. (2017). Does access to credit improve household welfare in the long-run?. *The Journal of Developing Areas*, *51*(1), 129-142.

Quang Vang, D. A. N. G., Viet Thanh Truc, T. R. A. N., Hieu, P. H. A. M., Van Nam, M. A. I., & Quoc Duy, V. U. O. N. G. (2023). Influence of Credit on the Income of Households Borrowing from Banks: Evidence from Vietnam Bank for Agriculture and Rural Development, Kien Giang Province. *The Journal of Asian Finance, Economics and Business*, *10*(2), 257-265.

Santoso, D. B. (2016). *Credit accessibility: the impact of microfinance on rural* Indonesian *households* (Doctoral dissertation, Lincoln University).

Stiglitz, J. E., & Weiss, A. (1981). Credit rationing in markets with imperfect information. *American Economic Review*, *71*(3), 393-410.

Shirono, K., Beyene, B., Fareed, F., Loots, C., Quevedo, A., & Naidoo, K. (2024). Understanding Barriers to Financial Access: Insights from Bank Pricing Data. *IMF Working Papers*, *2024*(150), A001. Retrieved Mar 26, 2025, from https://doi.org/10.5089/9798400280627.001.A001

Tonch, H. A. (2020). *The Impact of informal credit on household welfare* (Doctoral dissertation, KDI School).

Tu, T. T. T., Viet, N. Q., & Loi, H. H. (2015). Determinant of access to rural credit and its effect on living standard: case study about poor households in Northwest, Vietnam (Note 1). *International Journal of Financial Research*, *6*(2).

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Aspects of the economics of demography in Bulgaria

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Abstract

The demographic processes that have been taking place in the last few decades are of interest both from a scientific and practical point of view in the formation of national policy in this direction. The observed negative trends are characteristic of almost all regions of Bulgaria and give rise to a number of alarming trends. The formation of several main centers and peripheries is almost characteristic of the entire country. The labor force is in particular shortage in some of the regions, and research shows large disparities and a number of deficits. The present study focuses on two specific regions that have different economic characteristics. An attempt is made to analyze the current situation and search for possible solutions to overcome the crisis that has arisen.

Keywords: Demographic Processes, Labor Force, Crisis Situation, Economics, Economic Policies, Strategies Bulgaria.
Jel Codes: J5, J18

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1. Introduction

Demography is defined as the science of human population dynamics. It covers issues related to the size, structure and distribution of the population. It observes the processes of birth, death, reproduction, migration and aging. Within these limits, the life of settlements is also considered - some of which grow due to population growth, others decrease or disappear due to depopulation processes. Formally, demography remains closed in its parameters, which are reflected in statistics. For society and its development, the consequences related to the facts of demographic statistics remain, which are fundamental for the production of policies.

2. History and Characteristics of Demography

Demography (from Ancient Greek δῆμος (dêmos) "people, society" and -γραφία (-graphía) "writing, drawing, description") (Merriam-Webster, 2025a) is the statistical study of human populations: their size, composition (e.g., ethnic group, age), and how they change through the interplay of fertility (births), mortality (deaths), and migration (PRB, 2025b).

Demographic analysis examines and measures the dimensions and dynamics of populations; it can cover whole societies or groups defined by criteria such as education, nationality, religion, and ethnicity. Educational institutions (The Science of Population, 2025c) usually treat demography as a field of sociology, though there are a number of independent demography departments (Berkeley Demography, 2025d). These methods have primarily been developed to study human populations, but are extended to a variety of areas where researchers want to know how populations of social actors can change across time through processes of birth, death, and migration. In the context of human biological populations, demographic analysis uses administrative records to develop an independent estimate of the population (Demographic Analysis, 2025e). Demographic analysis estimates are often considered a reliable standard for judging the accuracy of the census information gathered at any time. In the labor force, demographic analysis is used to estimate sizes and flows of populations of workers; in population ecology the focus is on the birth, death, migration and immigration of individuals in a population of living organisms, alternatively, in social human sciences could involve movement of firms and institutional forms. Demographic analysis is used in a wide variety of contexts. For example, it is often used in business plans, to describe the population connected to the geographic location of the business (Murray, 2025f). Demographic analysis is usually abbreviated as DA (Demographic Analysis, 2025g). For the 2010 U.S. Census, The U.S. Census Bureau has expanded its DA categories (Demographic Analysis, 2025g). Also as part of the 2010 U.S. Census, DA now also includes comparative analysis between independent housing estimates, and census address lists at different key time points (Demographic Analysis, 2025g).

Patient demographics form the core of the data for any medical institution, such as patient and emergency contact information and patient medical record data. They allow for the identification of a patient and their categorization into categories for the purpose of statistical analysis. Patient demographics include: date of birth, gender, date of death, postal code, ethnicity, blood type, emergency contact information, family doctor, insurance provider data, allergies, major diagnoses and major medical history (What are Patient Demographics?, 2025h).

Formal demography limits its object of study to the measurement of population processes, while the broader field of social demography or population studies also analyses the relationships between economic, social, institutional, cultural, and biological processes influencing a population (Hinde, 2014).

Demographic thoughts traced back to antiquity, and were present in many civilisations and cultures, like Ancient Greece, Ancient Rome, China and India (Srivastava, 2005) Made up of the prefix demo- and the suffix -graphy, the term demography refers to the overall study of population (Population and Society, 2017).

In ancient Greece, this can be found in the writings of Herodotus, Thucydides, Hippocrates, Epicurus, Protagoras, Polus, Plato and Aristotle (Srivastava, 2005). In Rome, writers and philosophers like Cicero,

Seneca, Pliny the Elder, Marcus Aurelius, Epictetus, Cato, and Columella also expressed important ideas on this ground (Srivastava, 2005).

In the Middle Ages, Christian thinkers devoted much time in refuting the Classical ideas on demography. Important contributors to the field were William of Conches (Biller, 2000a), Bartholomew of Lucca (Biller, 2000a), William of Auvergne (Biller, 2000a), William of Pagula (Biller, 2000a), and Muslim sociologists like Ibn Khaldun (Korotayev, 2006).

One of the earliest demographic studies in the modern period was Natural and Political Observations Made upon the Bills of Mortality (1662) by John Graunt, which contains a primitive form of life table. Among the study's findings were that one-third of the children in London died before their sixteenth birthday. Mathematicians, such as Edmond Halley, developed the life table as the basis for life insurance mathematics. Richard Price was credited with the first textbook on life contingencies published in 1771 (Moorhead, 1989), followed later by Augustus De Morgan, On the Application of Probabilities to Life Contingencies (1838) (Jenkins & Yoneyama, (2000b).

In 1755, Benjamin Franklin published his essay Observations Concerning the Increase of Mankind, Peopling of Countries, etc., projecting exponential growth in British colonies (Valtier, William F., 2011). His work influenced Thomas Robert Malthus (Zirkle, 1941) who, writing at the end of the 18th century, feared that, if unchecked, population growth would tend to outstrip growth in food production, leading to ever-increasing famine and poverty (see Malthusian catastrophe). Malthus is seen as the intellectual father of ideas of overpopulation and the limits to growth. Later, more sophisticated and realistic models were presented by Benjamin Gompertz and Verhulst.

In 1855, a Belgian scholar Achille Guillard defined demography as the natural and social history of human species or the mathematical knowledge of populations, of their general changes, and of their physical, civil, intellectual, and moral condition (Caves, 2004).

The period 1860–1910 can be characterized as a period of transition where in demography emerged from statistics as a separate field of interest. This period included a panoply of international 'great demographers' like Adolphe Quetelet (1796–1874), William Farr (1807–1883), Louis-Adolphe Bertillon (1821–1883) and his son Jacques (1851–1922), Joseph Körösi (1844–1906), Anders Nicolas Kaier (1838–1919), Richard Böckh (1824–1907), Émile Durkheim (1858–1917), Wilhelm Lexis (1837–1914), and Luigi Bodio (1840–1920) contributed to the development of demography and to the toolkit of methods and techniques of demographic analysis (Henk A. de Gans & Frans van Poppel, 2000c).

The primary factors of demography cause social and economic problems that are difficult to prioritize and often turn into a closed circle of problems. Some of them put economic problems in the first place, others - purely demographic.

The situation in the two borderline cases would look like this:

− Shortage of personnel - human resources, characterized by an aging population; job closures caused by the closure of economic entities. Consequences: migration, closure of kindergartens and schools, active process of depopulation;

− Closure of enterprises, which leads to a reduction in jobs; increase in the unemployment rate. Consequences: migration, closure of kindergartens and schools, active process of depopulation.

Regardless of whether the problems start from demographic indicators or from economic policies and strategies, the results and consequences are similar. After the migration of the economically active population or the closure of educational institutions, it is already extremely difficult to resume any new economic activity. A vicious circle is obtained depending on which side of the problem is considered: there is a lack of personnel - there is no economy, migration follows or there is no economy - there is unemployment, migration follows.

The demographic parameters “birth rate”, “mortality” and “aging of the population” lead to a change in an important economic parameter – “labor force”, i.e. the labor market is changing significantly. The need to consider demography and economics are interconnected and their separate consideration would not be objective.

3. Methodology

For research on the needs of the labor market and the readiness of businesses and young people to implement entrepreneurship and the most common challenges for implementing business ideas through active use of systems for effective management of economic processes and entities.

Object of the study – the needs of the labor market and the readiness of businesses and young people to implement entrepreneurship and the most common challenges for implementing business ideas through active use of systems for effective management of economic processes and entities.

Subject of the study – Relations in the field of entrepreneurship, labor market, and business management models with the participation of young people and business representatives.

Target groups – young people in the age range 15 - 29 years, schoolchildren and students (300 participants), representatives of active business in the Varna and Montana regions (100 representatives), representatives of the education system - teachers, administration (100 representatives).

Purpose of the study – Preparation of an analysis of the needs of the labor market and the readiness of businesses and young people for implementation of entrepreneurship and the most common challenges for implementing business ideas through the active use of systems for effective management of economic processes and entities, as well as to determine promising sectors for the development of entrepreneurship.

Tasks of the study:

- determining the scope by target groups;
- territorial scope;
- business sectors for study;
- building a team of researchers to conduct the study;
- selection of methods for conducting the study;
- development of tools for the study;
- implementation of the study;
- processing of the results;
- preparation of a report – analysis.

Type of methodology – given the purpose of the study, a structured and object-oriented methodology is used. The methodology is research and applied-practical oriented. It organizes the work in a way that allows it to be defined in a short time, using the project resources, the main requirements of the labor market, the areas of entrepreneurial activity in the regions of Varna and Montana, and determining the main parameters of the systems for managing the efficiency of processes, in which interest is shown by young people and business representatives. Its practical nature stems from the fact that the objects of the study are defined target groups under the project and their attitude and participation in the subject of the study will be assessed. The research nature of the methodology is outlined in the second part of the goal - regarding the study of systems for effective process management, which is of research interest from the point of view of modern models for quality management, economic development, economic growth, and will provide an opportunity for the accumulation of databases (Terziev, 2022a; 2022b; Terziev & Lyubcheva, 2022c; 2022d).

3.1. Methods and means

3.1.1. Analyses:

It is necessary to analyze various documents related to the economic development of the regions:

– Reports on economic activity at municipal and regional levels; strategies for the development of municipalities and districts in the regions;

– Forecasts for development at municipal and regional levels. Analysis of labor force employment by sector; analysis of unemployment.

3.1.2. Interviews:

Suitable for this type of methodology are direct interviews using individual work cards. They have been applied to young people, business representatives, teachers, administration.

3.1.3. Surveys:

Surveys are suitable for studying the influence of certain factors on objects - in this case, prerequisites for the development of entrepreneurship-applied certification management systems. They are carried out with developed questionnaires, applied to additional groups of young people in Burgas.

Procedures:

– Planning the survey;

– Creating a plan for the sources of information, the time period of the survey and the survey scheme;

– Survey;

– The survey with questionnaires was conducted by the experts through direct interviewing /live/ and filling in the questionnaire samples;

– The survey with questionnaires was conducted electronically.

4. Economic Context of Demography

From the point of view of social development, the most important context that demographic facts presuppose is the economic one. Economics of demography means introducing economic factors into each of the problems considered because they can lead to changes in the observed processes. Unfortunately, economic research still does not sufficiently include demographic parameters (characteristics) to analyze the genesis of their influence. An illustration of this closed circle are analyses by various teams from the University of National and World Economy in Sofia, Bulgaria, which explain in detail the relationship between labor force fluctuations, the number of specialists with higher education, the development of higher education and regional disparities in the structure of jobs offered by the economy (Diagram 1).

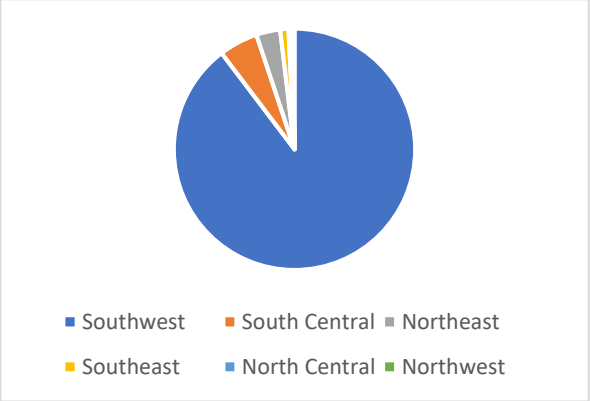

Diagram 1: Percentage Distribution of Job Offers by Region

Source: National Employment Agency, Bulgaria

The decline in the labor force is a key problem and it precedes economic activity. The decline in economic activity negatively affects the distribution of the labor force. This leads to a shortage or surplus of personnel in different sectors in different regions. Ultimately, in some sectors there is an increase in wages, in other sectors there is a decrease in competitiveness. A particularly important parameter in this situation is the participation of young people in the labor force structure. The lack of young people in the primary labor market can lead to a slowdown in economic growth and a decrease in tax revenues. Dependence on the pension system increases. At the same time, the decline in young people negatively affects economic growth, as they are the engine of innovation and entrepreneurship. Demographic indicators determine the characteristics of human resources in a given region, country, etc. Changing characteristics of human resources change economic parameters - availability or deficit of labor force, qualification of the labor force, unemployment rate. The lack of labor force (meeting the needs of the labor market) leads to the closure of enterprises, and the shortage of qualified personnel worsens efficiency and productivity, i.e., deteriorating demography means a suffering economy. It is known from macroeconomics that economic growth is achieved with capital and human resources. Capital is mobile, but human resources are not so mobile, at least not so dynamically. Delays in regulating deficits lead to economic decline.

The economic activity of each settlement depends on the number of the population, its age characteristics (as well as on the other qualitative characteristics of the labor force) and the prospects for growth or decline in the following periods, the qualification characteristics, educational structures, social parameters of the quality of life. The detailing of each of these indicators will decompose the possible planned actions to overcome the deficits that have arisen.

The quality and structure of education have a serious impact on the economic development of each region. The quality of education depends on the number of children of school age and the movement during a period of approximately 4 to 6 years. The constant decrease in the number of children, in addition to causing the closure of kindergartens or schools, does not allow for high-quality work, due to the need to compromise with the number of employed teachers, in many cases the joining of students to secondary schools, since the standards are the same for everyone. Protected schools cannot save things for a long time. This forces parents not to trust the “school bus”, which takes children to the nearby secondary school, but to seek livelihoods elsewhere, and this is usually a larger urban center. This is how the "center-periphery" scheme is formed. The education system is also connected in another way to the economy, and this is determined by the qualification structure that it produces (created as a result of training in certain professional areas). This usually applies to the level - region (municipality or administrative district). The mismatch of education with the requirements of regional business is of great importance for economic growth, leading to a decrease in economic activity. That is the education system, being also demographically predetermined, leads to the creation of certain economic problems. At the secondary education level, migration at least from cities to larger centers is still low, but this is not the case with higher education. Concentration in the capital refers not only to education but also to permanent employment after completing a certain level of education (“Bachelor” or “Master”). In Sofia (the capital of Bulgaria), there are 20 higher education institutions, which is approximately the same as all other higher education institutions in the other cities of the country. Students in Sofia are 40% of students in Bulgaria. University graduates in Sofia are 51.4% of the population, compared to the national average of 27.7%. In many other socio-economic and sociocultural indicators, the capital strongly outperforms the next 6 cities in the hierarchy according to data from the National Statistical Institute. This explains the fact that many regional and municipal centers are looking for opportunities to open higher education schools, branches, etc. centers that would retain the young generation in the respective settlement as a potential workforce, overcoming demographic, respectively economic problems. The National Roadmap of Higher Education has delayed this process by at least two years, but the opposition is serious. An example of such an aspiration to create a center of higher education is Burgas, where in a few years the Faculty of Medicine at the University “Prof. Dr. Asen Zlatarov” was established, and the establishment of a Faculty of Pharmacy is being prepared. Branches of the National Academy of Arts and Sofia University “St. Kliment Ohridski” and the Theater College “Lyuben Groys” have been established. Burtas (the fourth largest city in Bulgaria with a population of approximately 200,000 inhabitants) already has 2 universities and 2 university branches, one college branch, and an independent academic campus that is being prepared and built. And this is done with the exceptional efforts of the

local municipal administration. The trend of retaining young people is also emerging in secondary education through the creation of innovative specialties and schools. Municipalities offer scholarships to ensure the retention of young people and to prevent internal or external migration of young people.

Regional development through innovation is guided by the principle of smart specialization – by focusing regional investments and efforts on innovation in sectors with high growth potential. This should be part of a broader shift in which higher education institutions act as "entrepreneurs" that link the knowledge opportunities they create and offer with the needs identified in smart specialization strategies (Tsonkov et al., 2001).

The impact of demographics on the economy has a particular emphasis on the younger generation. A study of two regions – Varna and Montana (centers of administrative districts) shows a serious difference in the general economic situation. The study was conducted in the region of Bulgaria – Montana and Varna, with two different economic developments (Erazmus+ Program. (2019).

The first region (Montana) is characterized by a much greater narrowness of business, limited business innovations, a narrow range of economic sectors, a general attitude among the population towards stagnation, poverty, and being stuck in simpler forms of work and business, higher youth, and other unemployment. Here, the general situation is to a significantly higher extent demotivating for young people to plan a modern professional career and to be charged with impulses for innovation and entrepreneurship. Here, among the young people, there is a very high dose of "psychology of laziness" – 16% of young people in Montana state that they have never worked before, while this share in Varna is a minimal 2.4%.

Conversely, in the Varna region, the situation is with a much wider range of business opportunities and incentives for modern business practices and personal innovations. The general attitude among the population is that this is one of the most vibrant public structures and regions in the country, giving young people a field for expression and entrepreneurship. Here, there are three times more successful young entrepreneurs than in the Montana region. In the Varna region, young people who resignedly declare that business is not for them in principle are only 3%, while in Montana they are 14%.

The interest of young people in entrepreneurship also distinguishes the two regions, although in certain indicators there is an identity.

The question of young people is whether they invest personal funds in a new business or rely on other financing. This is an extremely important indicator of the seriousness of the initiative, of taking a truly personal risk, of dedication, and of personal economic activity, in the absence of other opportunities.

Here too, the youth entrepreneurial potential is impressive – 7% have already invested their personal funds in their business initiatives, and another 8% are so serious about their intention that they are raising personal funds to be able to start. The share of young people raising personal funds for investment is the same as in the Varna region – 8%. Young people with initiative do not give up their intentions easily. This should be stimulated through the implemented municipal and state policies and forms of financial support for starting a business – start-up programs are naturally aimed primarily at young people. The data from the survey clearly show the validity of this claim.

The situation is much more discouraging in the Montana region and this is clearly visible in the option "business is not for me" – 26% in the Varna region versus 42% in the Montana region. This is impressive in another of the questions related to "I do business, but the money is not mine" – in the Varna region, this is 6%, while in the Montana region, it is not. The essential thing about youth attitudes is that in addition to personal development, career, prestige, and interest in entrepreneurship, the social and humanitarian aspects are intertwined. This is best expressed when through personal business one earns a lot and makes a good career, but at the same time produces things (products and services) that are useful for people and customers.

It is very important to assess whether there is a balance between school/university and the desires of young people for a specific profession and specialty in order to rely on their economic participation.

There is good correspondence, but only for 1/3 of young people. 24% of them declare that there is some correspondence, but if they make a compromise with their expectations and claims.

The self-assessment is interesting, that the school actually gives such an opportunity to the young, but they are confused, looking for unrealistic things, and do not take into account the realities. Here, 30% of all those who participated in the study are self-critical, and in the Montana region this share increases to 47% - these are almost half of the young people surveyed. About 15% of young people are completely self-critical of their generation - that there is slavery to stupid fashions and irrational consideration of their own work and professional prospects or they are "hostages" of the choices of their parents and relatives.

The task before the school for sufficiently early professional orientation is clearly outlined - to find a better balance and mutual benefit between employees and business.

When we conduct research on young people as a workforce and future entrepreneurs in the regions and try to make a forecast for development, we do so under the threat of the process of depopulation. Less developed regions are in the role of donors of young people and vitality, of specialists and creativity, of entrepreneurship and business imagination. They are the ones who are harmed, in many aspects they are also the “victim”. Conversely, vibrant and promising regions are in an advantageous position, they receive “ready-made” educated and motivated young people, and they receive their creative and active capacity.

In our study, the contrast was observed and reported between the regions of Montana and Varna. Other similar contrasting pairs of regions in Bulgaria in approximately identical situations can be observed. In carrying out a nationally representative study, a comprehensive picture would be obtained, from which we could make a map of the vibrant and prosperous regions with their young people and their entrepreneurial activity, and on the other side are the gray areas of the declining and stagnant regions with their young people and shrunken and worrying entrepreneurship.

Among the current young people in both regions, not so many are willing to leave their birthplace. 5% - elsewhere in Bulgaria, and another 9% - somewhere abroad. For pessimists, this is an unexpectedly small contingent of new (e) migrants.

Is there a general feeling of a massive and irreversible departure of young people from Bulgaria?

We are constantly being told (by the public and other media) that young people in Bulgaria are panicking and running out of Terminal 2 (the capital’s international airport – now Vasil Levski International Airport – Sofia, Bulgaria). Unfortunately, the media in our country are promoting emigration. At the local level, this propaganda and suggestions directed at young people must be successfully countered. This is a difficult task that must be simultaneously carried out by local authorities and businesses, by local schools and by our patriotic intelligentsia.

For 59% plus 34% of respondents, this is extremely important or at least somewhat important. For only 5% of young people, this is of no significant importance and is not a personal motivation for business entrepreneurship. In the Varna region, the proportion is 71% plus 26%, respectively, against the minimal 2%. While in the Montana region, the social sensitivity to business among young people is significantly lower - only 29% “extremely important”, plus the prevailing 54% “somewhat important”, against 14% who frankly state that this is not important in their personal orientation.

5. Social Context of Demography

The population decline in Bulgaria may lead to depopulation of settlements, especially in rural areas. This may have a negative impact on infrastructure, access to services, and social ties. The desertification of small settlements leads to excessive concentration of the population in large cities, which in turn creates problems with overcrowding, lack of housing, difficulties with transportation, and the quality of social services provided. The increase in the number of elderly people imposes higher costs for health and social care. The pension system may become overloaded, which would lead to a decrease in the size of pensions or an increase in the tax burden on workers. In addition, there may be a shortage of specialists to care for the elderly. Additional consequences are depopulation of certain regions; concentration of the population in a few centers; imbalances in the labor market; deteriorated quality of life; burden on the healthcare system, etc. Each of these hypotheses contains a wide range of problems

that should be well analyzed, and considered in an integrated context, in order to be able to produce solutions towards synchronizing policies.

The options for the projected development (data from the National Statistical Institute) of the country's population by 2050 are as follows:

− Realistic (Convergence) – 5,791,137 people (2050). A decrease for the forecast period of 1,151,005 people, or 16.6%;

− Optimistic (Relative acceleration) – 6,034,526 people (2050). A decrease for the forecast period of 918,106 people, or 13.2%;

− Pessimistic (Relative deceleration) – 5,669,528 people (2050). A decrease for the forecast period of 1,267,695 people or 18.3%.

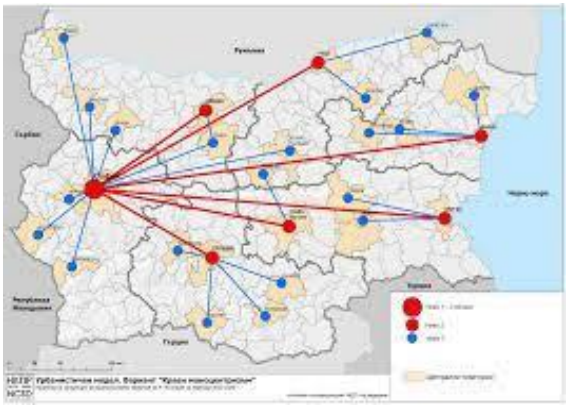

Figure 1: Model of urban development - extreme monocentrism

Source: National Concept for Spatial Development 2013 – 2025

The labor market in any settlement or region depends on the number of residents, the qualification characteristics of the human resource, on the age distribution, which affects economic activity, including entrepreneurial attitudes, on the development of innovative and digital trends. It is seen that even the optimistic version does not give hope for the economy of demography to improve. The data on the age structure of the population also point in this direction.

Deteriorating demography leads to a change in the structure of the workforce, a decrease in the working-age population, pressure on the pension system, a lack of qualified personnel, and low efficiency of working economic structures. Depopulation of certain regions leads to the closure of kindergartens and schools, emigration of the younger generation, low quality of social services, and disparities between regions. According to data from the National Statistical Institute of Bulgaria, the country is moving towards a monocentric territorial model, which determines the center-periphery development scheme (Fig. 1).

However, the deteriorating demographics are not only expressed in deficits. In some regions, the change in the structure of the workforce is of the opposite sign - the increase in the population in certain regions creates a shortage of jobs, increased unemployment, and pressure on service systems. In this case, economic growth is achieved by pressure on social systems. The decreasing number of workers compared to the increasing number of pensioners leads to greater pressure on the pension system. This means that fewer people have to pay for the pensions of a larger number of people. In order to ensure adequate pensions, measures are needed to increase the revenues of the pension system (for example, raising the retirement age, increasing contributions, or introducing additional pension schemes). The aging population leads to increased demand for health care, social services for the elderly (home care, daycare centers, nursing homes), as well as services for people with disabilities, the number of whom may increase with age. The increased demand for services leads to higher costs for the state and municipalities. This may lead to the need to optimize resources and introduce new financing methods. The rapid aging of the population also creates a problem with the lack of sufficiently qualified personnel in the social sector, especially in the areas of health care and social work. Quality of life and satisfaction

are among the important aspects of the social context of demography. This perspective of the study among young people in the two regions – Montana and Varna is interesting.

6. Conclusion

How does everyone cope with material and financial difficulties? This is a direct and accurate indicator.

14% are categorical that they live well, and their high income is enough for them. Here are not only young people with private businesses, but also young specialists in enterprises and institutions with "normally" high incomes and good prospects. These are the local "oases" of prosperity, good conditions, and high incomes.

25% cope through more activity – they work more, look for, and find additional work. And so they increase their income. Here again, the polarization between higher, on the one hand, and secondary education on the other, and low education is visible. But this time the polarity is along the lines of those living well.

Let us note that among graduates, i.e. among specialists, the share is 26% – the highest, but against a huge part of unrealized graduates – another 36% of them save, do not use their potential, and another 12% are immersed in helplessness and even panic.

The mutual influence of demography and economics raises questions in both directions - How can demographic trends cause economic growth or economic decline and how can economics lead to solving demographic problems or to their deepening? This Hamletian question is key to sustainable development.

This is precisely the reason why the combination "economics of demography" acquires a special meaning. In such reasoning, we can include every sector of public life, every parameter of development and we will always reach the same conclusion. Economics and demography, formally different in nature and parameters systems, turn out to be mutually dependent to such an extent that we can speak of the economics of demography because economics determines the basis of the development of society.

References

Ampah, S. N., Ambrose, J. O., Omagwa, J. O., & Frimpong, S. (2017). Effect of access to credit and financial services on poverty reduction in the central region of Ghana. *International Journal of Business and Social Science*, *8*(8), 49-60.

Bari, M. A., Khan, G. D., Khuram, M. A., Islam, Md. J., & Yoshida, Y. (2024). Financial inclusion and expenditure patterns: Insights from slum households in Bangladesh. *Cogent Economics & Finance*, 12(1).

Bhutta, N., & Hizmo, A. (2022). Do minorities pay more for mortgages? *The Review of Financial Studies, 35*(4), 1597-1641. https://doi.org/10.1093/rfs/hhab042

Bidisha, S. H., Khan, A., Imran, K., Khondker, B. H., & Suhrawardy, G. M. (2017). Role of credit in food security and dietary diversity in Bangladesh. *Economic Analysis and Policy*, *53*, 33-45.

Bocher, T. F., Alemu, B. A., & Kelbore, Z. G. (2017). Does access to credit improve household welfare? Evidence from Ethiopia using endogenous regime switching regression. *African Journal of Economic and Management Studies*, *8*(1), 51-65.

Boko, J., Raju, D., & Younger, S. D. (2023). Government social protection programme spending and household welfare in Lesotho. *South African Journal of Economics*, *91*(3), 375-393.

Bruhn, M., & Love, I. (2014). The Real Impact of Improved Access to Finance: Evidence from Mexico. *The Journal of Finance*, *69*(3), 1347–1376. http://www.jstor.org/stable/43611187

Bukari, C., Peprah, J. A., Ayifah, R. N. Y., & Annim, S. K. (2021). Effects of credit 'plus' on poverty reduction in Ghana. *The Journal of Development Studies*, *57*(2), 343-360.

Burgess, R. and Pande, R. (2005) Can Rural Banks Reduce Poverty? Evidence from the Indian Social Banking Experiment. American Economic Review, 95, 780-795. https://doi.org/10.1257/0002828054201242

Café, R. M. (2023). Access to credit and quality of expenditure: evidence from Brazilian municipalities. *Cadernos de Finanças Públicas*, *23*(1).

Choudhury, H. A., Das, A., & Rahman, A. (2017). The effectiveness of micro-credit programmes focusing on household income, expenditure and savings: Evidence from Bangladesh. *Journal of Competitiveness*.

Crush, Jonathan & Dodson, Belinda & Williams, Vincent & Tevera, Daniel. (2017). Harnessing Migration for Inclusive Growth and Development in Southern Africa. 10.2307/j.ctvh8r3q1.

Dagnew, D. K., & Kaur, R. (2016). The impact of microfinance on household expenditure patterns: Evidence from Amhara Credit and Saving Institution, Ethiopia. *International Journal in Management & Social Science*, *4*(1), 88-97.

FinScope Lesotho 2021 report.

Friedman, M. (1957). *A theory of the consumption function.* Princeton University Press.

Islam, T. (2016). *Microcredit and poverty alleviation*. Routledge.

Kaboski, J. P., & Townsend, R. M. (2012). The impact of credit on village economies. *American Economic Journal: Applied Economics*, *4*(2), 98-133.

Karlan, D., & Zinman, J. (2011). Microcredit in theory and practice: using randomized credit scoring for impact evaluation. *Science (New York, N.Y.)*, *332*(6035), 1278–1284. https://doi.org/10.1126/science.1200138.

Khandker, S. R., Koolwal, G. B., & Samad, H. A. (2010). *Handbook on impact evaluation: Quantitative methods and practices.* World Bank.

Kumar, A., Mishra, A. K., Sonkar, V. K., & Saroj, S. (2020). Access to Credit and Economic Well-Being of Rural Households. *Journal of Agricultural and Resource Economics*, *45*(1), 145-160.

Makuluni, F. E., & Dunga, H. M. (2022). The impact of access to credit on welfare inequality in Malawi. *Studia Universitatis Babes-Bolyai Oeconomica*, *67*(2), 50-66.

Manzilati, A., Kornitasari, Y., Suprayogi, S., & Efani, A. (2022). Analysis Of Factors Affecting Credit Access And Their Impact On Welfare. In *Journal of International Conference Proceedings* (Vol. 5, No. 4, pp. 405-414).

Moahid, M., Khan, G.D., Bari, M.D.A. and Yoshida, Y. (2023), "Does access to agricultural credit help disaster-affected farming households to invest more on agricultural input?", *Agricultural Finance Review*, Vol. 83 No. 1, pp. 96-106.

Modigliani, F., & Brumberg, R. H. (1954). Utility analysis and the consumption function: An interpretation of cross-section data. In K. K. Kurihara (Ed.), *Post-Keynesian economics* (pp. 388-436). Rutgers University Press

Morduch, Jonathan. 1999. "The Microfinance Promise." *Journal of Economic Literature* 37 (4): 1569–1614**.**DOI: 10.1257/jel.37.4.1569

Ozoh, J. N., Nwogwugwu, U. C., Nwokoye, E. S., & Metu, G. (2022). Impact of access to credit on household welfare in Nigeria. *International Journal of Management Studies and Social Science Research*, *4*(2), 187-198.

Pomi, S. S. (2019). Impact of microcredit on rural poverty alleviation in the context of Bangladesh. *International Journal of Economics and Finance*, *11*(6), 1-70.

Quach, H. M. (2017). Does access to credit improve household welfare in the long-run?. *The Journal of Developing Areas*, *51*(1), 129-142.

Quang Vang, D. A. N. G., Viet Thanh Truc, T. R. A. N., Hieu, P. H. A. M., Van Nam, M. A. I., & Quoc Duy, V. U. O. N. G. (2023). Influence of Credit on the Income of Households Borrowing from Banks: Evidence from Vietnam Bank for Agriculture and Rural Development, Kien Giang Province. *The Journal of Asian Finance, Economics and Business*, *10*(2), 257-265.

Santoso, D. B. (2016). *Credit accessibility: the impact of microfinance on rural* Indonesian *households* (Doctoral dissertation, Lincoln University).

Stiglitz, J. E., & Weiss, A. (1981). Credit rationing in markets with imperfect information. *American Economic Review, 71*(3), 393-410.

Shirono, K., Beyene, B., Fareed, F., Loots, C., Quevedo, A., & Naidoo, K. (2024). Understanding Barriers to Financial Access: Insights from Bank Pricing Data. *IMF Working Papers*, *2024*(150), A001. Retrieved Mar 26, 2025, from https://doi.org/10.5089/9798400280627.001.A001

Tonch, H. A. (2020). *The Impact of informal credit on household welfare* (Doctoral dissertation, KDI School).

Tu, T. T. T., Viet, N. Q., & Loi, H. H. (2015). Determinant of access to rural credit and its effect on living standard: case study about poor households in Northwest, Vietnam (Note 1). *International Journal of Financial Research*, *6*(2).

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Corporate management in the digital Age: Harnessing automation, robotics, and AI in the Fourth Industrial Revolution

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Abstract

The Fourth Industrial Revolution, driven by unprecedented advancements in automation, robotics, and artificial intelligence (AI), is profoundly redefining the contours of corporate management. This paper undertakes a critical inquiry into the transformative impact of these disruptive technologies on contemporary organisational strategies, decision-making architectures, and workforce configurations within an increasingly digitized milieu. It elucidates the manifold opportunities engendered by the integration of intelligent systems—including heightened operational efficiency, accelerated innovation, and strategic competitiveness—while concurrently interrogating the attendant challenges, notably ethical quandaries, technological displacement, and widening skill asymmetries. Highlighting the exigency of adaptive leadership, perpetual reskilling, and judicious technological assimilation, the study accentuates the necessity of cultivating a human-centric ethos amidst digital transformation. By engaging with illustrative case studies and scrutinizing emergent global trends, the paper proffers empirically grounded insights and pragmatic frameworks to enable enterprises to harness the disruptive potential of automation, robotics, and AI in pursuit of sustainable, inclusive, and future-ready corporate growth.

Keywords: Corporate management, Digital age, Automation, Robotics, AI, Fourth Industrial Revolution
Jel Codes: M11, M15

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1. Introduction

The Fourth Industrial Revolution (4IR) signifies a profound reconfiguration of the global industrial landscape, underpinned by the convergence of transformative technologies such as automation, robotics, artificial intelligence (AI), the Internet of Things (IoT), and quantum computing. Distinct from its predecessors—characterized respectively by mechanization, electrification, and digitalization—4IR embodies an era of cyber-physical integration wherein intelligent systems are embedded within the very fabric of organizational structures, operations, and value creation processes. This pervasive technological infusion engenders a paradigm defined by hyper-connectivity, real-time data analytics, and autonomous decision-making capabilities.

Against this backdrop, the domain of corporate management is undergoing a fundamental metamorphosis. No longer confined to conventional hierarchies and linear workflows, modern enterprises are increasingly adopting agile, innovation-centric frameworks that leverage the full potential of emerging technologies. This study seeks to interrogate the evolving contours of corporate management in the digital age, focusing on how 4IR technologies are reshaping strategic imperatives, operational efficiencies, and organizational resilience. It delves into the intricate interplay between technological advancement and managerial practice, addressing critical issues such as workforce dislocation, ethical governance, and cybersecurity vulnerabilities.

Simultaneously, the research illuminates the transformative opportunities presented by 4IR—ranging from the reinvention of business models and the enhancement of adaptive capacity to the cultivation of synergistic human-machine collaboration. Drawing on a synthesis of cutting-edge research, empirical case studies, and forward-looking perspectives, this inquiry underscores the imperative of cultivating adaptive leadership, strategic foresight, and a culture of continuous innovation. In doing so, it contributes to a nuanced understanding of how corporations can navigate the complexities of the Fourth Industrial Revolution, thereby positioning themselves for sustainable, inclusive, and future-ready growth.

2. Aims, Objectives, and Scope

This study aims to undertake a comprehensive examination of the integration of automation, robotics, and artificial intelligence (AI) within contemporary corporate management, with a particular emphasis on their transformative role in the era of the Fourth Industrial Revolution. It seeks to critically explore how these cutting-edge technologies are reshaping corporate governance structures, revolutionizing decision-making processes, and optimizing operational efficiencies. In addition, the research endeavors to evaluate their broader implications for business competitiveness, workforce dynamics, and long-term strategic planning.

The study is structured around the following core objectives:

- To critically investigate the transformative impact of automation, robotics, and AI on the modernization of corporate management practices.
- To identify and analyze the key enablers and barriers influencing the adoption and integration of these technologies within corporate settings.
- To assess the implications of AI and robotics on workforce management, with a focus on reskilling, job displacement, and productivity enhancement.
- To examine the ethical, legal, and regulatory dimensions associated with the deployment of AI and automation in business contexts.
- To evaluate empirical case studies of organizations that have successfully implemented these technologies, drawing actionable insights from their experiences.
- To propose strategic policy and management recommendations aimed at facilitating effective adoption and optimization of AI, robotics, and automation for sustained competitive advantage.

The scope of this study encompasses corporate management practices across a broad spectrum of sectors, ranging from manufacturing to services, wherein AI, robotics, and automation have been, or are

being, integrated into operational processes. The inquiry investigates the far-reaching implications of these technologies on organizational hierarchies, evolving employee roles, decision-making paradigms, and strategic frameworks. From a geographical perspective, the study adopts a global outlook, encompassing both developed and emerging economies, thereby offering a holistic analysis of international trends while highlighting regional specificities in technological adoption and adaptation.

Limitations

- Scope of Companies: The study may encounter limitations due to the restricted availability of data from enterprises that have already adopted AI, robotics, and automation technologies. Given that a significant proportion of firms remain in the early phases of technological integration, the processes of data acquisition and subsequent analysis may prove to be both complex and constrained.
- Technological Variability: The rapid and continuous evolution of AI, robotics, and automation presents a formidable challenge, as the findings of the study may quickly become outdated. The dynamic nature of technological innovation necessitates caution in generalizing results over time.
- Regional Bias: Despite deliberate efforts to ensure geographical diversity, the study may inadvertently reflect a bias toward firms situated in advanced economies, where the deployment of such technologies is comparatively more mature and widespread.
- Human Factors: The investigation may not fully encapsulate the intricate dimensions of human adaptation to automation. Factors such as employee resistance, cultural impediments, and the nuanced dynamics of organizational change management may elude comprehensive analysis, thereby limiting the study's depth in this regard.

3. Methodology

This study adopts a robust mixed-methods research design to explore the transformative implications of automation, robotics, and artificial intelligence (AI) for corporate management in the era of the Fourth Industrial Revolution. The methodological framework comprises four interrelated components: an extensive literature review, in-depth case studies, empirical data collection through surveys and semi-structured interviews, and a comparative analysis. Each element is strategically employed to capture both the complexity and nuance of technological integration within diverse corporate environments.

Literature Review: An exhaustive review of peer-reviewed academic literature, industry white papers, policy documents, and authoritative online sources forms the theoretical and conceptual foundation of this research. The review concentrates on the following key areas:

- The evolution and defining characteristics of the Fourth Industrial Revolution
- The strategic role of AI, robotics, and automation in contemporary corporate governance
- Theoretical models concerning technological adoption and innovation diffusion within organizational contexts

This synthesis serves to contextualize emerging developments, identify gaps in the extant body of knowledge, and inform the design and direction of the empirical inquiry.

Case Studies: The study integrates qualitative case analyses of purposively selected organizations that have operationalized automation, AI, and robotic technologies across varying sectors, including but not limited to manufacturing, finance, healthcare, and logistics. The selection aims to reflect heterogeneity in technological applications and managerial approaches. Primary data for the case studies are gathered through:

- Document analysis, including corporate strategy reports, digital transformation frameworks, and internal communications
- Key informant interviews with senior executives, digital innovation leads, and IT managers

This methodological approach enables a rich, context-sensitive understanding of implementation strategies, organizational capabilities, leadership orientations, and performance outcomes.

Surveys and Semi-Structured Interviews:

To elicit broader stakeholder perspectives and lived experiences, this study utilizes both quantitative and qualitative instruments:

- Surveys: Standardized questionnaires are administered to a stratified sample of employees across hierarchical levels and functional domains. These surveys assess awareness, perceived utility, and readiness regarding the adoption of AI and automation in their respective professional roles.
- Interviews: Semi-structured interviews are conducted with business executives, human resource practitioners, and digital transformation experts. These conversations provide deeper interpretive insights into cultural dynamics, change management processes, and employee adaptation strategies.

The triangulation of survey data and interview narratives enhances the reliability and internal validity of the research findings.

Comparative Analysis: A comparative analytical framework is employed to examine divergent experiences and outcomes among organizations with varying degrees of success in integrating advanced technologies. By juxtaposing high-performing adopters with firms that have faced significant resistance or suboptimal outcomes, the study seeks to uncover:

- Best practices in technological integration and organizational alignment
- Contextual and institutional factors influencing success or failure
- Strategic and policy-level recommendations for future corporate transformation

The comparative dimension synthesizes both qualitative insights and empirical observations to produce actionable knowledge for organizational decision-makers navigating the digital shift. Through this multi-dimensional methodological design, the study undertakes a comprehensive exploration of how automation, robotics, and AI are reshaping the contours of corporate management in the digital age. By integrating theoretical constructs, empirical evidence, and comparative insights, the research endeavors to contribute substantively to the discourse on digital transformation, organizational innovation, and sustainable competitiveness in the Fourth Industrial Revolution.

4. Survey of Literature

The Fourth Industrial Revolution (4IR) has fundamentally transformed corporate management, with automation, robotics, and artificial intelligence (AI) playing pivotal roles in reshaping organizational structures, decision-making, and operations. The literature surrounding this transformation encompasses various dimensions, from technological advancements to human resource management, strategy, and ethical considerations.

The Rise of Automation, Robotics, and AI in Corporate Management: Automation, robotics, and AI are driving the modernization of corporate management by enhancing efficiency, improving decision-making, and optimizing resource allocation. In the context of the Fourth Industrial Revolution, corporate management is increasingly leveraging automation, robotics, and artificial intelligence (AI) to enhance operations and drive innovation. Recent studies and industry reports provide valuable insights into this transformation:

The paper titled ‘Development of Autonomous Artificial Intelligence Systems for Corporate Management’ explores the integration of autonomous AI systems in corporate governance, discussing the prerequisites for their development and the potential impact on decision-making processes at the board level (Romanova, 2024).

The paper titled ‘Driving Innovation through Organizational Restructuring and Integration of Advanced Digital Technologies’ examines how organizational restructuring, coupled with the adoption of

advanced digital technologies like AI and robotics, can drive innovation and enhance operational efficiency in manufacturing (Nour, 2024).

The paper 'Strategic Integration of Artificial Intelligence in the C-Suite: The Role of the Chief AI Officer', discusses the emerging role of the Chief AI Officer in corporate leadership, emphasizing the importance of strategic AI integration at the executive level to drive innovation and maintain competitive advantage (Schmitt, 2024).

The article 'Challenges and Best Practices in Corporate AI Governance: Lessons from the Biopharmaceutical Industry' provides insights into the operationalization of AI governance within corporations, highlighting challenges and best practices from the biopharmaceutical sector that are applicable across industries (Mökander, 2024).

The study 'Organizational Culture and the Usage of Industry 4.0 Technologies: Evidence from Swiss Businesses' investigates how different organizational cultures influence the adoption and utilization of Industry 4.0 technologies, including AI and robotics, providing insights into aligning corporate culture with digital transformation initiatives (Wiese, 2024).

According to Brynjolfsson and McAfee (2014), these technologies have the potential to automate routine tasks, allowing human workers to focus on more creative and strategic functions (Brynjolfsson, 2014). Automation is defined as the use of technology to perform tasks without human intervention, while robotics involves machines designed to execute specific tasks, and AI refers to the simulation of human intelligence in machines (Davenport, 2018). The combination of these technologies has resulted in smarter and more efficient workflows, enabling companies to scale operations rapidly.

5. The Fourth Industrial Revolution: An Overview

The term *Fourth Industrial Revolution* (4IR), coined by Klaus Schwab, founder of the World Economic Forum, denotes a transformative epoch characterized by the fusion of physical, digital, and biological systems. The foundational pillars of this revolution—comprising the Internet of Things (IoT), big data, AI, robotics, blockchain, and cloud computing—are not merely tools but intelligent systems capable of learning, adapting, and executing autonomous decisions (Schwab, 2016). Distinct from the digitization wave of the 20th century, 4IR technologies are distinguished by their unprecedented velocity, scale, and systemic complexity. This revolution transcends traditional industrial boundaries, reconfiguring organizational models, operational processes, and societal conventions while exerting profound influence on virtually every aspect of human existence. At its core, the Fourth Industrial Revolution represents a quantum leap in technological integration, constructing a highly interconnected and intelligent global ecosystem.

Key Characteristics of the Fourth Industrial Revolution

The defining attributes of 4IR lie in its capacity to fundamentally transform industries through advanced technologies that amplify connectivity, automate functions, embed intelligence, and integrate operations across domains:

- Connectivity: Sophisticated IoT systems facilitate seamless data transmission across networks, enabling real-time insights and adaptive decision-making.
- Automation: Autonomous technologies minimize human intervention, streamline operations, and mitigate inefficiencies.
- Intelligence: AI and machine learning analyze voluminous and complex data sets, offering predictive insights and enabling strategic foresight.
- Integration: Cross-disciplinary convergence of technologies fosters agile, responsive, and data-centric business ecosystems.

Core Technologies Driving the Fourth Industrial Revolution

1. Automation: Technologies designed to function with minimal human input enhance operational efficiency, reduce costs, and ensure procedural consistency across sectors.

2. Robotics: Advanced robotic systems powered by sensors and algorithms perform tasks ranging from industrial manufacturing to precision surgery with exceptional accuracy.
3. Artificial Intelligence: AI empowers machines to learn, reason, and make decisions autonomously, revolutionizing domains such as healthcare, finance, and logistics.
4. Big Data and IoT: The proliferation of interconnected devices generates immense volumes of data, facilitating real-time analytics and data-driven decision-making.
5. Quantum Computing: Although nascent, quantum computing holds the potential to resolve problems of staggering complexity, surpassing the capabilities of conventional computing systems.

Automation: Redefining Efficiency

As a cornerstone of 4IR, automation is transforming industrial operations by substituting routine tasks with high-precision, efficient processes. Technologies such as programmable logic controllers (PLCs) and robotic process automation (RPA) are optimizing workflows, minimizing human error, and significantly enhancing productivity.

Notable Applications of Automation

- Manufacturing: Automated assembly lines and additive manufacturing technologies (e.g., 3D printing) expedite production and enable scalable customization.
- Healthcare: AI-driven diagnostic tools and robotic-assisted procedures improve diagnostic accuracy and patient outcomes.
- Transportation: Autonomous vehicles and unmanned aerial systems revolutionize logistics and supply chain dynamics.
- Finance: Algorithmic trading platforms execute high-frequency transactions with unmatched speed and precision.

Challenges Associated with Automation

1. Labour Market Disruption: The displacement of repetitive job roles necessitates comprehensive upskilling and reskilling frameworks.
2. Cybersecurity Vulnerabilities: The digital nature of automated systems renders them susceptible to cyber threats, endangering data integrity and operational continuity.
3. Ethical Dilemmas: Delegating critical decision-making to machines, especially in sensitive areas like healthcare and autonomous transportation, raises complex ethical and legal questions.

Robotics: Enhancing Precision and Versatility

Robotics is a transformative vector within the 4IR paradigm. Modern robots, equipped with sophisticated sensors, actuators, and advanced control systems, perform intricate tasks with unparalleled dexterity and consistency. Their deployment spans an expansive range of industries, from manufacturing to medicine.

Innovations in Robotics

- Industrial Robotics: Collaborative robots, or *cobots*, work synergistically with human operators, augmenting productivity and ensuring workplace safety.
- Medical Robotics: Robotic-assisted surgical systems, advanced prosthetics, and rehabilitation devices are redefining standards of care and patient mobility.
- Service Robotics: From automated concierges in hospitality to educational aides in classrooms, service robots enhance customer interaction and service delivery.
- Defense Robotics: Autonomous drones and unmanned systems bolster defense strategies, improving situational awareness and reducing personnel risk.

Challenges in Robotic Deployment

1. High Capital Investment: The cost of designing, deploying, and maintaining cutting-edge robotic systems can be prohibitive.
2. Systems Integration: Seamlessly embedding robotic technologies into legacy systems requires substantial infrastructural overhaul and workforce training.
3. Ethical and Regulatory Issues: The use of robotics in domains such as surveillance, law enforcement, and military applications invokes pressing ethical and legal concerns that demand robust governance frameworks.

The Fourth Industrial Revolution is fundamentally redefining the architecture of industrial and societal systems through an unprecedented confluence of connectivity, automation, and intelligence. While the transformative potential of technologies such as automation, robotics, and AI is immense, their adoption must be underpinned by ethical stewardship, proactive workforce development, and strategic foresight. Only through such holistic approaches can we ensure that technological progress fosters sustainable, inclusive, and equitable growth in the digital age.

6. Artificial Intelligence and the Fourth Industrial Revolution: Transforming Industries and Society

Artificial Intelligence (AI) lies at the heart of the Fourth Industrial Revolution, acting as a catalyst for profound change by enabling machines to emulate human intelligence through learning, reasoning, and problem-solving. Underpinned by sophisticated machine learning (ML) and deep learning algorithms, AI has revolutionized industries, offering predictive insights and automating intricate processes with unprecedented efficiency.

AI Applications Across Industries

- **Healthcare:** AI-driven diagnostic tools and predictive analytics are transforming healthcare by enabling personalized treatment and enhancing patient outcomes through more accurate and timely diagnoses.
- **Education:** Intelligent tutoring systems and adaptive learning platforms tailor educational experiences to individual needs, thereby promoting more effective and inclusive learning environments.
- **Finance:** AI strengthens financial systems by improving fraud detection, refining credit scoring models, and providing advanced financial forecasting, ensuring stability and resilience in financial markets.
- **Retail:** AI-powered recommendation engines, inventory management systems, and customer service chatbots are reshaping the retail landscape, enhancing the consumer experience while optimizing business operations.

Ethical and Societal Challenges of AI

1. **Bias and Fairness:** AI systems may inadvertently perpetuate biases embedded in their training data, leading to outcomes that are discriminatory and unjust.
2. **Privacy Concerns:** The widespread collection and utilization of personal data by AI systems raise critical concerns regarding privacy and data security, necessitating stringent safeguards.
3. **Accountability:** Assigning responsibility for decisions made by AI systems remains a complex issue, posing significant legal and ethical challenges in the context of decision-making autonomy.
4. **Economic Inequality:** The economic benefits of AI tend to concentrate within a small, technologically advanced elite, potentially exacerbating existing global wealth inequalities.

Opportunities and Impacts of the Fourth Industrial Revolution

The Fourth Industrial Revolution offers unique prospects for reshaping industries and societies alike:

1. **Economic Growth:** Automation and AI drive productivity gains, foster innovation, and reduce operational costs, propelling global economic advancement.
2. **Quality of Life:** Advances in healthcare, education, and public services promise to improve living standards, thereby contributing to societal well-being.
3. **Sustainability:** Smart technologies enable optimized resource usage, contributing to environmental sustainability by reducing waste and promoting eco-friendly practices.
4. **Global Connectivity:** Digital platforms serve as a nexus for global collaboration, connecting individuals, businesses, and governments, thereby fostering greater interconnectivity.

7. Challenges and Risks of the Fourth Industrial Revolution

However, the Fourth Industrial Revolution also presents formidable challenges that require urgent attention:

1. **Workforce Disruption:** The automation of routine tasks necessitates widespread reskilling efforts as workers transition to new roles in an evolving job market.
2. **Digital Divide:** Unequal access to cutting-edge technologies risks deepening socio-economic disparities, particularly between developed and developing nations.
3. **Cybersecurity Threats:** As digital interconnectedness increases, so too does the exposure to cyberattacks, data breaches, and other forms of digital insecurity.
4. **Regulatory Gaps:** The rapid pace of technological development often outstrips the capabilities of regulatory frameworks, leaving gaps in ethical oversight and legal clarity.

8. The Role of Policy and Education in Navigating the Fourth Industrial Revolution

Addressing the challenges and capitalizing on the opportunities of the Fourth Industrial Revolution requires comprehensive policy strategies and transformative educational reforms:

1. Policy Initiatives:
    - Foster public-private partnerships to accelerate technological innovation and ensure equitable access to emerging technologies.
    - Implement robust regulations that address ethical dilemmas and safeguard data privacy while encouraging innovation.
    - Invest in digital infrastructure to bridge the technological divide and ensure broad access to cutting-edge tools and services.
2. Educational Reforms:
    - Prioritize STEM (science, technology, engineering, and mathematics) education to equip future generations with the skills necessary to thrive in a technology-driven world.
    - Promote lifelong learning and reskilling programs to facilitate workforce adaptability in response to rapidly changing job markets.
    - Encourage interdisciplinary education that emphasizes the integration of technology with broader societal issues, fostering solutions to complex global challenges.

9. Impact of the Fourth Industrial Revolution on Corporate Management

1. Strategic Decision-Making: AI-powered analytics provide corporate leaders with real-time insights, facilitating data-driven strategic decisions. Predictive modeling enables organizations to foresee market shifts, optimize resource allocation, and maintain a competitive edge (Chen et al., 2012).
2. Workforce Transformation: Automation and robotics are reshaping workforce dynamics. As routine tasks become automated, roles that require creativity, problem-solving, and emotional

intelligence take center stage. Corporate leaders must cultivate a culture of continuous learning and development to ensure employees are prepared for these evolving demands. According to McKinsey (2020), automation may necessitate the transition of up to 375 million workers globally into new occupational categories, highlighting the need for proactive workforce transformation (Institute, The future of work in the age of automation , 2020).

Operational Efficiency

Automation technologies streamline operations by minimizing errors and enhancing productivity. Robotic process automation (RPA) allows organizations to automate repetitive tasks like data entry, freeing employees to focus on high-value activities. Amazon's use of robotics in its warehouses exemplifies operational excellence (Wamba-Taguimdje, 2020).

Enhanced Customer Experience

AI-powered tools such as chatbots and recommendation systems enable personalized customer interactions. By leveraging big data and machine learning, companies can better understand consumer behavior, boosting customer satisfaction and loyalty. Netflix's recommendation engine is a prime example of this innovation (Gomez-Uribe, 2015).

Ethical and Governance Challenges

The adoption of 4IR technologies raises ethical concerns, including data privacy, algorithmic bias, and job displacement. Corporate governance must address these challenges by creating frameworks that ensure transparency, accountability, and compliance with regulations like GDPR (Goodman, 2017).

Key Technologies Shaping Corporate Management

1. Artificial Intelligence (AI): AI applications, such as IBM Watson, facilitate decision-making, predictive maintenance, and fraud detection, driving efficiency and innovation (Huang & Rust, 2018).
2. Robotics: Collaborative robots (cobots) enhance manufacturing precision and productivity, as seen in Tesla's advanced production lines (Bogue, 2018).
3. Automation: RPA and workflow automation reduce manual intervention, lowering error rates and operational costs. Organizations adopting RPA report cost savings of up to 30% (Willcocks, 2015).
4. Blockchain: This technology ensures secure and transparent transactions, with applications in supply chain management, smart contracts, and financial services (Tapscott, 2016).
5. Internet of Things (IoT): IoT platforms, like GE's Predix, enhance operational visibility and predictive maintenance, optimizing resource use (Porter, How smart, connected products are transforming companies , 2015).

10. Case Studies: Real-World Applications of 4IR Technologies

Siemens: Smart Factories

Siemens exemplifies the integration of Fourth Industrial Revolution (4IR) technologies through its smart factories. Leveraging IoT, AI, and robotics, the company employs automated production processes. Its pioneering "Digital Twin" concept enables real-time simulation, monitoring, and optimization of manufacturing operations, resulting in reduced downtime, minimized waste, and enhanced efficiency (Rückert et al., 2016).

Alibaba: AI-Powered E-Commerce

Alibaba has revolutionized e-commerce by incorporating AI technologies into customer engagement, inventory management, and logistics optimization (Chen Y. M., 2020). Its AI-driven algorithms provide personalized shopping experiences and ensure efficient supply chain management, significantly driving revenue growth and operational scalability (Chen, 2012).

Walmart: Supply Chain Optimization

Walmart utilizes blockchain and IoT to enhance transparency and efficiency across its supply chain. By tracking products from farm to shelf, the company ensures food quality, safety, and reduced waste. These innovations strengthen consumer trust and streamline operations (Kamath, 2018).

Challenges in Adopting 4IR Technologies

Cost and Investment

Implementing 4IR technologies demands significant financial investments in infrastructure, R&D, and workforce training. Small and medium-sized enterprises (SMEs), in particular, face financial constraints that hinder their ability to adopt these transformative solutions (Janssen, 2019).

Skill Gap

The accelerated advancement of 4IR technologies has outpaced the availability of skilled professionals in areas such as AI, data analytics, and robotics. Corporate leaders must prioritize workforce development through training, upskilling programs, and talent acquisition strategies to bridge this skill gap (Bughin, 2018).

Resistance to Change

Organizational resistance, rooted in cultural and structural inertia, often poses a barrier to adopting new technologies. Effective change management strategies, including clear communication, employee involvement, and incremental implementation, are crucial for overcoming this resistance (Kotter, 1996).

Ethical and Regulatory Issues

The adoption of AI and other 4IR technologies raises ethical concerns, including data privacy, algorithmic bias, and accountability for automated decisions. Regulatory frameworks must evolve to balance innovation with ethical considerations, ensuring responsible implementation (Binns, 2018).

Strategies for Successful Implementation

Leadership Commitment**:** Strong leadership is essential for driving digital transformation. Corporate leaders must articulate a compelling vision, allocate resources strategically, and foster organizational alignment to ensure successful implementation (Westerman G. B., 2014).

Collaborative Ecosystems**:** Collaboration with technology providers, academic institutions, and governmental organizations is critical for innovation and resource-sharing. For instance, Microsoft's "AI for Good" initiative demonstrates the power of partnerships in addressing global challenges (Smith, 2018).

Continuous Learning Culture: To remain competitive in the 4IR era, organizations must foster a culture of continuous learning. Initiatives such as training programs, workshops, and online education platforms enable employees to stay updated with technological advancements (Noe, 2017).

Ethical Governance Frameworks: Developing and implementing ethical governance frameworks is vital to ensure the responsible use of 4IR technologies. Organizations should establish AI ethics committees, adopt transparency policies, and enforce compliance mechanisms to address ethical dilemmas (Floridi, 2018).

11. AI's Role in Workforce Transformation and Management

The integration of automation, robotics, and AI has led to significant changes in the workforce, particularly concerning job displacement, skill development, and employee engagement. Many scholars highlight the potential risks of job losses due to automation, with Frey and Osborne (2017) estimating that 47% of US jobs could be automated within the next two decades (Frey, 2017). However, others argue that AI and robotics will create new job opportunities by complementing human skills rather than replacing them (Bessen, 2019).

A key challenge for businesses is managing this workforce transition, including upskilling and reskilling employees to work alongside advanced technologies. According to a report by the World Economic Forum, while automation will lead to the displacement of certain jobs, it will also create opportunities for workers with advanced skills in data analysis, programming, and machine learning (Forum, 2020).

Strategic Decision-Making and Organizational Structures: AI and automation are also influencing corporate strategy and decision-making. Machine learning algorithms, which form the foundation of many AI systems, enable companies to analyze vast amounts of data and make real-time, data-driven decisions. McKinsey found that organizations leveraging AI in decision-making saw a 5-10% increase in revenue and a 20-30% improvement in operational efficiency (Institute, 2020). Furthermore, AI-driven tools like predictive analytics and process automation can streamline operations, reduce costs, and improve customer satisfaction.

Automation also reshapes organizational structures by flattening hierarchies and enabling more agile and flexible management practices. As reported by Westerman, Bonnet, Ferraris, and Tricoire (2014), companies that successfully implement 4IR technologies create an environment that fosters collaboration between human employees and intelligent systems, enhancing overall productivity.

Ethical and Regulatory Considerations: The deployment of AI, robotics, and automation raises important ethical concerns regarding privacy, accountability, and fairness. As AI systems become more autonomous, the issue of algorithmic bias has garnered significant attention. Studies have shown that AI models can perpetuate existing biases, particularly in areas like hiring, lending, and criminal justice (O'Neil, 2016). In the corporate context, ensuring that AI systems are transparent, unbiased, and accountable is crucial for maintaining consumer trust and complying with legal frameworks.

The regulatory landscape for AI and robotics is still evolving, with governments and international bodies attempting to establish guidelines to address these issues. According to the European Commission, regulations on AI should focus on ensuring safety, transparency, and the protection of fundamental rights while promoting innovation (Commission, 2019).

Case Studies and Industry Applications

Several industries have successfully harnessed the potential of automation, robotics, and AI to drive innovation and growth. In the manufacturing sector, companies like General Motors and Tesla have integrated robotics to enhance production capabilities and reduce costs. In retail, AI is used for inventory management, personalized marketing, and customer service automation, with companies like Amazon and Walmart at the forefront (Chui, 2016).

Similarly, the financial sector has adopted AI-driven solutions for fraud detection, credit scoring, and algorithmic trading (Huang, 2021). The healthcare industry is another area where AI and robotics are being utilized, with AI systems aiding in diagnostics, patient care, and drug development (Topol, 2019).

The Future of Corporate Management in the Digital Age

The future of corporate management will increasingly rely on the seamless integration of AI, robotics, and automation to drive innovation and competitiveness. However, the shift will require organizations to rethink their approach to leadership, culture, and strategy. As noted by Porter and Heppelmann, the success of 4IR technologies depends on how businesses adapt their organizational culture and leadership styles to foster collaboration between humans and machines (Porter, 2014).

Additionally, as the role of technology in management continues to grow, corporate leaders will need to ensure that AI and automation align with the company's ethical values, customer needs, and long-term strategic goals (Westerman, 2014).

The literature reveals that while the integration of AI, robotics, and automation holds immense potential for improving operational efficiency and business decision-making, it also presents challenges related to workforce transformation, ethical considerations, and regulatory compliance. Companies that successfully harness these technologies while managing the associated risks will be better positioned to thrive in the digital age and the Fourth Industrial Revolution.

A Conceptual Framework for Corporate Management and Employment Dynamics

The convergence of automation, robotics, and artificial intelligence (AI) within the broader context of the Fourth Industrial Revolution is fundamentally transforming corporate management paradigms, restructuring industrial landscapes, and redefining traditional employment frameworks. This conceptual framework critically examines the intricate interrelationship between technological innovations and

workforce evolution, offering a comprehensive global perspective on the multifaceted impact of these disruptive technologies on employment and organizational design.

Organized around four principal themes—Technological Advancements, Impact on Employment, Shifts in Organizational Structures, and Global Perspectives and Policy Implications—the framework seeks to provide a nuanced understanding of how automation, robotics, and AI are reshaping the contemporary world of work.

Technological Advancements: The Pillars of Transformation

Automation, robotics, and AI represent the core enablers of transformative change in corporate management. These technologies collectively enhance operational efficiency, mitigate human error, and improve the speed and adaptability of business processes.

- Automation entails the application of machines and software to execute repetitive or routine tasks traditionally performed by human labor. Its prevalence is most pronounced in manufacturing, administrative processing, and customer service operations.
- Robotics involves the deployment of mechanical systems programmed to carry out physical tasks with precision and consistency. These systems are extensively utilized in sectors such as automotive production, logistics, and warehousing.
- Artificial Intelligence (AI) empowers machines to simulate human cognitive functions such as decision-making, pattern recognition, and learning from experience. AI applications are profoundly influencing strategic management, real-time analytics, customer engagement, and predictive modeling.

These technological advancements are not only revolutionizing operational mechanisms but are also recalibrating the nature of skill demands in the labor market. They simultaneously catalyze innovation and disrupt conventional occupational classifications, thereby reshaping the contours of global employment.

Impact on Employment: The Dual Nature of Technological Integration

The infusion of automation, robotics, and AI into the workforce landscape embodies a duality—one that involves both the displacement of existing jobs and the creation of novel employment opportunities.

- Job Displacement and Creation: Automation is projected to replace human involvement in a broad spectrum of routine and manual occupations, with significant implications for employment patterns. A seminal study by Carl Benedikt Frey and Michael Osborne at Oxford University estimated that approximately 47% of jobs in the United States are at high risk of automation over the next two decades.

However, these same technologies are also spawning new roles, particularly in fields requiring advanced technical expertise, such as AI development, robotics engineering, data analytics, and cyber-physical systems design. The emergence of these roles underscores a profound transformation in labor market composition.

This bifurcated impact accentuates the imperative for large-scale reskilling and upskilling initiatives. Preparing the workforce to navigate and thrive within an increasingly digitalized economy is not merely a strategic priority but an existential necessity for sustainable and inclusive growth.

The framework proceeds to analyze Shifts in Organizational Structures and Global Perspectives and Policy Implications, thereby furnishing a holistic perspective on the transformative influence of automation, robotics, and AI on corporate governance, human capital, and the future of work (Prabhakar, 2015). On the other hand, it also opens up new avenues for job creation, particularly in high-skill and tech-driven roles.

- Job Displacement: Certain sectors, such as manufacturing, logistics, and customer service, face significant job losses due to automation. Frey and Osborne (2017) suggest that nearly half of U.S. jobs are at risk of automation, particularly those that involve routine physical and cognitive tasks (Frey, The Future of Employment: How Susceptible Are Jobs to Computerization?, 2017).

- Job Creation: While automation may displace jobs, it is also expected to create new roles in fields such as data science, machine learning, robotics engineering, and AI ethics. These roles demand specialized knowledge, thus creating a shift in employment types towards higher-skill, technology-oriented positions (Bessen, AI and Jobs: The Role of Demand , 2019).
- Reskilling and Upskilling: To address the potential job displacement, there is an urgent need for reskilling programs. The World Economic Forum (2020) reports that businesses will need to invest in continuous learning to prepare workers for the evolving digital economy. Workers in routine jobs must adapt to roles that require digital literacy and problem-solving skills.

Wage Inequality

Another consequence of technological integration is the potential widening of wage inequality. AI and robotics are more likely to benefit highly skilled workers who are able to work alongside advanced technologies. Conversely, those with lower levels of education or training may face more difficulty in finding new job opportunities, exacerbating existing socio-economic divides (Autor, 2015).

Shift in Organizational Structures: The Changing Role of Human Capital

Automation and Decision-Making: With AI-driven decision-making tools and automated processes, companies are restructuring their management and operational frameworks. The ability of AI systems to analyze vast amounts of data and make decisions in real time is reshaping strategic and operational management. McKinsey found that organizations using AI-driven analytics to guide decision-making report significant improvements in efficiency, revenue, and customer satisfaction (Company, 2020).

- Flattening of Hierarchies: The integration of automated systems leads to a flattening of organizational hierarchies. As machines handle more routine and operational tasks, decision-making is increasingly pushed to the edges of the organization, fostering a more decentralized management approach (Westerman et al., 2014).
- Collaborative Work Environments: The future of work involves greater collaboration between humans and machines. Humans bring creativity, strategic thinking, and emotional intelligence, while machines handle repetitive tasks. This synergy requires new organizational designs that foster collaboration between AI systems and employees.

Employee Roles and Responsibilities: AI and robotics are redefining the roles of employees. While some workers may transition into more tech-focused positions, others will see their roles evolve. Managers are now tasked with overseeing not only human employees but also the AI systems that support decision-making processes. This changing role of management is an area that requires further research and adaptation.

Global Perspectives and Policy Implications: The impact of automation, robotics, and AI on employment varies globally, with developed economies generally ahead in terms of technological adoption compared to emerging economies. However, the challenges and opportunities these technologies create are universal.

- Developed Economies: In economies such as the U.S., Europe, and Japan, there is a greater emphasis on automation to maintain competitiveness in global markets. These countries have higher levels of investment in AI research, and their businesses are leading in the implementation of AI technologies in corporate management (Davenport, How AI is changing the way companies compete, 2018). However, they also face challenges related to job displacement and wage inequality.
- Emerging Economies: Countries such as India, Brazil, and parts of Africa may face a different set of challenges. Automation and AI adoption may lead to greater productivity in sectors such as agriculture and manufacturing, but these countries also need to address gaps in digital literacy and infrastructure to capitalize on these technologies. Additionally, the potential for job displacement in lower-skill sectors is higher in these economies.
- Global Policy and Regulation: As AI, robotics, and automation rapidly reshape industries, governments and international bodies must implement policies that balance technological

innovation with job preservation and workforce transformation. Regulatory frameworks should promote innovation while ensuring the ethical use of AI, transparency in automation practices, and protecting workers' rights (Commission, Ethics Guidelines for Trustworthy AI , 2019).

Navigating the Future of Work in the Digital Age

The interplay between automation, robotics, artificial intelligence (AI), and employment is intricate and multifaceted. While these technologies unequivocally promise enhanced productivity and operational efficiency, the primary challenge lies in mitigating their socioeconomic repercussions. Corporate leadership must not only reconfigure organizational frameworks to accommodate technological advancement but also nurture human capital to remain integral to evolving work paradigms. Global collaboration among governments, industry leaders, and the workforce is indispensable in ensuring that the dividends of the Fourth Industrial Revolution are distributed equitably. This requires a resolute commitment to reskilling initiatives, the ethical deployment of AI, and the promotion of inclusive economic growth.

The trajectory of corporate management stands poised for profound transformation, largely shaped by the advent of emerging technologies such as quantum computing, edge artificial intelligence (AI), and 5G connectivity. These innovations offer the prospect of unparalleled advancements in operational efficiency, real-time analytics, and customer engagement. Nevertheless, their integration demands a proactive approach, necessitating not only robust strategic planning but also comprehensive regulatory frameworks to safeguard against potential disruptions.

Corporate leaders who adopt these technologies with a future-focused mindset will unlock transformative opportunities, positioning their organizations to not merely adapt but to thrive in the ever-evolving digital landscape. Through such forward-thinking, organizations can secure a competitive edge, driving sustained growth and pioneering innovation within their respective industries.

12. Conclusion

The Fourth Industrial Revolution signifies the dawn of a transformative epoch that is reshaping both corporate management and societal structures. The deployment of advanced technologies, such as automation, robotics, and artificial intelligence, unlocks unprecedented opportunities for innovation, operational efficiency, and enhanced customer engagement. However, these advancements also introduce a range of intricate challenges—rising costs, widening skill gaps, and ethical dilemmas that demand careful consideration and resolution.

To navigate this complex era successfully, organizations must demonstrate strategic foresight, visionary leadership, and a steadfast commitment to fostering collaboration, inclusivity, and sustainability. By embracing these principles, organizations will not only harness the full potential of Fourth Industrial Revolution technologies but also position themselves to flourish amidst the complexities of the digital age.

Recommendations

1. Prioritize Investment in Digital Infrastructure and Cutting-Edge Technologies
   In the contemporary business environment, it is imperative for companies to allocate resources towards the establishment of resilient and scalable digital infrastructures. This entails equipping organizational frameworks with the latest technological innovations, including cloud computing, artificial intelligence (AI), machine learning, and automation systems. Such investments will enable the seamless integration of robotics and AI into operational workflows, thus optimizing efficiency and driving scalability across business processes.
2. Formulate a Comprehensive AI and Automation Strategy

Organizations must devise a robust and strategic framework for the integration of AI and automation into their business models. This process necessitates a systematic identification of areas where automation would yield the greatest benefit, the establishment of clear and attainable milestones, and the judicious allocation of resources towards research and development (R&D), employee training, and

system integration. A long-term vision should guide these efforts, ensuring sustainable growth and technological alignment.

3. Cultivate a Culture of Continuous Learning and Agility

The accelerating pace of technological advancement demands that corporate entities foster a culture of perpetual learning and adaptability. Businesses must invest in regular upskilling programs designed to enhance digital literacy and proficiency in emerging technologies such as AI and robotics. By embedding a growth mindset within the workforce, organizations can mitigate resistance to technological change, thereby empowering employees to collaborate effectively with automated systems and AI tools.

4. Promote Synergy Between Human Intelligence and AI

Rather than perceiving automation and AI as mere substitutes for human labor, corporations should pivot towards cultivating synergistic relationships between human intelligence and artificial systems. Automation can alleviate the burden of repetitive, time-intensive tasks, while AI can augment human decision-making processes. By harnessing the complementary strengths of both, businesses can fuel innovation, amplify productivity, and uphold employee satisfaction.

5. Prioritize Ethical Deployment of AI and Robotics

As AI and robotics become increasingly embedded in corporate operations, it is paramount that ethical considerations underpin their deployment. Corporate leadership must ensure that AI algorithms are transparent, equitable, and devoid of biases. Furthermore, the ramifications of automation on the workforce must be handled with care, including proactive measures to retrain displaced employees and provide avenues for reskilling, thereby fostering a just transition to an AI-driven economy.

6. Leverage Data Analytics for Informed Decision-Making

The digital era offers vast datasets ripe for analysis. Companies should invest in advanced data analytics capabilities, enabling them to harness the power of AI to generate real-time insights, optimize business operations, and enhance customer experiences. Data-driven strategies will not only foster more informed decision-making but will also be crucial for maintaining a competitive edge in an increasingly dynamic marketplace.

7. Enhance Cybersecurity and Safeguard Data Integrity

The growing reliance on AI, automation, and robotics increases the vulnerability of businesses to cyber threats. To mitigate such risks, companies must implement rigorous cybersecurity protocols and continually update their defenses against emerging threats. Regular security audits, coupled with comprehensive training on cybersecurity best practices for all employees, should be central to any corporate strategy focused on digital transformation.

8. Adopt Agile and Adaptive Organizational Structures

In the face of rapid technological change, organizations must remain nimble and responsive to the challenges and opportunities presented by the Fourth Industrial Revolution. This requires the adoption of agile organizational structures that empower cross-functional teams to innovate, experiment with new technologies, and swiftly adapt to disruptions in the business landscape. Such flexibility is essential for maintaining resilience and ensuring continued growth.

9. Center Innovation on Customer Needs

The integration of automation, robotics, and AI should be strategically directed towards enhancing customer experiences. Companies must utilize these technologies to deliver personalized services, optimize supply chain operations, and develop innovative products that resonate with evolving consumer expectations. Moreover, the use of AI-powered feedback loops will enable businesses to continuously refine their offerings and stay attuned to customer demands.

10. Foster Strategic Partnerships with Technological Innovators

In order to remain at the forefront of digital innovation, businesses should actively pursue partnerships with cutting-edge technology firms and startups. Collaborative relationships with these external entities provide access to novel technologies, fresh business models, and innovative ideas that may not arise organically within the organization. These partnerships can facilitate the rapid scaling of technological solutions, thereby ensuring that businesses can respond effectively to the demands of a rapidly evolving digital economy.

By implementing these advanced strategies, corporate management can fully capitalize on the potential of automation, robotics, and AI, ensuring not only enhanced operational efficiency but also the long-term sustainability and competitiveness of the organization in the digital age.

References

Autor, D. H. (2015). Why Are There Still So Many Jobs? The History and Future of Workplace Automation . *Journal of Economic Perspectives , 29*(3), 3-30.

Bessen, J. E. (2019). *AI and Jobs: The Role of Demand* . Brookings Institution.

Bessen, J. E. (2019). *AI and Jobs: The Role of Demand* . Brookings Institution.

Binns, R. (2018). Fairness in machine learning: Lessons from political philosophy . *Proceedings of the 2018 Conference on Fairness, Accountability, and Transparency.*

Bogue, R. (2018). What are the prospects for robots in the automotive industry? . *Industrial Robot: An International Journal, 45*(2), 127-132.

Brynjolfsson, E. a. (2014). *The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies.* W.W. Norton & Company.

Bughin, J. M. (2018). *AI adoption advances, but foundational barriers remain.* McKinsey Global Institute.

Chen, H. C. (2012). Business intelligence and analytics: From big data to big impact . *MIS Quarterly, 36*(4), 1165-1188.

Chen, Y. M. (2020). Application of artificial intelligence in e-commerce . *Journal of Innovation and Knowledge, 5*(1), 10-20.

Chui, M. M. (2016). Where machines could replace humans—and where they can't (yet). *McKinsey Quarterly*.

Commission, E. (2019). *Ethics Guidelines for Trustworthy AI* . European Commission.

Commission, E. (2019). *Ethics Guidelines for Trustworthy AI* . European Commission.

Company, M. &. (2020). *The State of AI in 2020* . McKinsey Global Institute.

Davenport, T. H. (2018). How AI is changing the way companies compete. *Harvard Business Review*.

Davenport, T. H. (2018). How AI is changing the way companies compete. *Harvard Business Review*.

Floridi, L. C. (2018). How to design AI for social good: Seven essential factors . *Science and Engineering Ethics, 24*(5), 1777-1800.

Forum, W. E. (2020). *The Future of Jobs Report 2020.* World Economic Forum.

Frey, C. B. (2017). The Future of Employment: How Susceptible Are Jobs to Computerization? *Technological Forecasting and Social Change*.

Frey, C. B. (2017). The Future of Employment: How Susceptible Are Jobs to Computerization? *Technological Forecasting and Social Change*.

Gomez-Uribe, C. A. (2015). The Netflix recommender system: Algorithms, business value, and innovation . *ACM Transactions on Management Information Systems (TMIS), 6*(4), 1-19.

Goodman, B. a. (2017). European Union regulations on algorithmic decision-making and a "right to explanation" . *AI Magazine, 38*(3), 50-57.

Huang, M. H. (2021). Artificial Intelligence in Service. *Journal of Service Research, 24(1), 3-22., 24*(1), 3-22.

Institute, M. G. (2020). *The future of work in the age of automation* . McKinsey & Company.

Institute, M. G. (2020). *The State of AI in 2020.* McKinsey & Company.

Janssen, M. v. (2019). Factors influencing big data decision-making quality . *Journal of Business Research, 98*, 173-185.

Kamath, R. (2018). Food traceability on blockchain: Walmart's pork and mango pilots with IBM . *The Journal of the British Blockchain Association, 1*(1), 3712.

Kotter, J. P. (1996). Leading change . *Harvard Business Review Press*.

Mökander, J. S.-S. (2024). Challenges and Best Practices in Corporate AI Governance: Lessons from the Biopharmaceutical Industry . *arXiv preprint arXiv:2407*, 5339.

Noe, R. A. (2017). Learning in the twenty-first-century workplace . *Annual Review of Organizational Psychology and Organizational Behavior, 4*, 245-275.

Nour, S. a. (2024). Driving Innovation Through Organizational Restructuring and Integration of Advanced Digital Technologies: A Case Study of a World-leading Manufacturing Company . *European Journal of Innovation Management* .

O'Neil, C. (2016). *Weapons of Math Destruction: How Big Data Increases Inequality and Threatens Democracy.* Crown Publishing.

Porter, M. E. (2014). How Smart, Connected Products Are Transforming Competition. *Harvard Business Review*.

Porter, M. E. (2015). How smart, connected products are transforming companies . *Harvard Business Review, 93*(10), 96-114.

Prabhakar, A. C. (2015). Evaluation of technology, trade, and inclusive development: Chinese Experiences. *Investment Management and Financial Innovations, 12*(2), 180. From https://www.businessperspectives.org/index.php/journals/investment-management-and-financial-innovations/issue-2-cont-7

Romanova, A. (2024). Development of Autonomous Artificial Intelligence Systems for Corporate Management . *arXiv preprint arXiv:2407* , 17588 .

Schmitt, M. (2024). Strategic Integration of Artificial Intelligence in the C-Suite: The Role of the Chief AI Officer . *arXiv preprint arXiv:2407*, 10247.

Smith, B. a. (2018). *The future computed: Artificial intelligence and its role in society* . Microsoft.

Tapscott, D. a. (2016). *Blockchain revolution: How the technology behind bitcoin is changing money, business, and the world.* Penguin.

Topol, E. (2019). *Deep Medicine: How Artificial Intelligence Can Make Healthcare Human Again.* Basic Books.

Wamba-Taguimdje, S. L. (2020). Blockchain technology and its impact on the supply chain . *Technological Forecasting and Social Change, 162*, 120376.

Westerman, G. B. (2014). Leading digital: Turning technology into business transformation. *Harvard Business Review Press*.

Westerman, G. B. (2014). The Digital Advantage: How digital leaders outperform their peers in every industry. *MIT Sloan Management Review*.

Wiese, S. A. (2024). Organizational Culture and the usage of Industry 4.0 Technologies: Evidence from Swiss Businesses. *arXiv preprint arXiv:2412* , 12752.

Willcocks, L. L. (2015). Robotic process automation: The next transformation lever for shared services . *Journal of Information Technology Teaching Cases , 5*(2), 77-79.

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Hotel performance attributes and consumer complaints in online reviews

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Abstract

Understanding customer complaints is crucial for improving the quality of hotel service. This study examines hotel performance attributes based on consumer-generated online reviews, specifically focusing on negative reviews from a major hotel-rating platform. By analyzing 35 hotels with the highest number of negative reviews, the research identifies the most criticized attributes, revealing that "tangibles"—including physical facilities, cleanliness, and room conditions—are the primary sources of dissatisfaction. The study employs the SERVQUAL model to categorize service quality attributes into five dimensions: reliability, assurance, tangibles, empathy, and responsiveness. Findings indicate that tangibles account for 83% of customer complaints, followed by responsiveness, empathy, assurance, and reliability. Using qualitative data analysis software, the research further explores specific problem areas within tangibles, such as hotel décor, room amenities, and service facilities. Common complaints include outdated furnishings, poor cleanliness, malfunctioning equipment, and uncomfortable beds. The paper also highlights the role of online reviews in shaping consumer behavior. Negative reviews are particularly influential, as they affect potential guests' perceptions and purchasing decisions. Furthermore, customer complaint behaviour (CCB) is examined, emphasizing that dissatisfied customers often express grievances through online platforms, influencing broader consumer sentiment. Previous studies suggest that service failures, particularly in high-rated hotels, lead to significant online complaints, reinforcing the importance of addressing core service deficiencies.

Keywords: Hotel Performance Attributes, Consumer Complaining Behavior, Online Review, SERVQUAL, Hospitality, Service
Jel Codes: L830, M300

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1. Introduction

Online reviews popularity and their impact on individual buying behavior give rise to the argument that information provided on online platforms is more influential among consumers nowadays. In the hospitality industry, online reviews are widely accepted to play a significant role in influencing guests' experiences and improving the service quality of the hotels (Hu et al., 2019). Hotel guests as well as hotels can benefit greatly from the use of online reviews. For hotel guests, other customers' opinions are a great help in making a purchase decision. In turn, for hotels online reviews are valuable and provide detailed insights into customer satisfaction and customer experience of the services provided. In a study by Medill Spiegel Research Center (SRC) about the power of online reviews in shaping customer behavior displaying reviews, soar conversion rates rapidly and when a product receives five reviews, the likelihood of purchase increases by 270% (cswenson, 2021). Hotel owners pay special attention to negative online reviews because they are perceived as more trustworthy, selfless, and impactful than positive ones (Cunningham et al., 2010). This study aims to identify the attributes which play a significant role in customers' purchase preferences. Attribute-based shopping is a purchase method that matches customers' desires with the purchase of a product/service. Looking at the most complaint attributes mentioned on online reviews by hotel guests could provide a greater understanding of the dynamics of poor reviews and their impact on customers' purchase decisions and satisfaction.

2. Literature Review

2.1. Hotel Performance Attributes

Hotel performance attributes encompass various features that customers consider essential when choosing a hotel or assessing the quality of its services and facilities. The concept of 'importance' and 'unimportance' in this context has been previously established in the literature (Callan, 1997). In 1985, Parasuraman, Zeithaml, and Berry—three American marketing scholars—identified ten service quality dimensions based on customer evaluations: Reliability, Tangibles, Responsiveness, Competence, Access, Courtesy, Communication, Credibility, Security, and Understanding. Later, in 1988, they refined these ten dimensions into five, introducing the SERVQUAL Model, which consists of five key service dimensions: Reliability, Assurance, Tangibles, Empathy, and Responsiveness (Kobiruzzaman, 2020).

The 5 dimensions of service attributes encompass (Parasuraman et al., 1985):

1.Reliability: Ensuring services are delivered accurately, punctually, and credibly, emphasizing consistency, like timely mail delivery to customers.

2.Assurance: Building trust and credibility through factors like competence, courtesy, credibility, and security, exemplified by showing respect and politeness during customer interactions.

3.Tangibles: Focusing on the physical aspects such as facilities, employee appearance, equipment, and information systems, including elements like organizational cleanliness and staff attire.

4.Empathy: Concentrating on attentive customer service to provide caring and personalized experiences, incorporating factors like accessibility, effective communication, and understanding customer needs.

5.Responsiveness: Demonstrating eagerness to assist customers promptly and respectfully, emphasizing willingness and quick service delivery, ensuring customers feel valued and their issues are addressed promptly.

In the SERVQUAL model, Parasuraman et al. (1988) identify tangibility as a key dimension in assessing service quality. According to Albayrak, Caber, and Aksoy (2010), tangible attributes have a stronger impact on overall guest satisfaction because they can be easily modified or upgraded. Similarly, Oberoi and Hales (1990) emphasize the significance of tangibility in the hotel industry, while Joes and Lockwood (2004) suggest that hotels should prioritize tangible aspects in their operations to enhance customer satisfaction. Most hotel products consist of both tangible and intangible attributes, which are closely interconnected and play a crucial role in shaping guests' perceptions of quality (Alzaid & Soliman, 2002). The concept of 'tangibility' or 'physical quality' typically refers to various service

elements, including the appearance of facilities, equipment, staff presentation, advertising materials, and other physical features involved in service delivery. Within the hotel industry, tangibility encompasses the external appearance of hotel buildings, accommodation, and restaurant facilities. Unlike intangible aspects, tangible elements can be objectively measured, evaluated, and standardized (Marić D. et al. 2016). Johnston (1995) categorizes tangibility into two aspects: the cleanliness and neatness of physical components and the comfort of the service environment.

Numerous studies have examined the perceptions and preferences of both hotel managers and customers in the hospitality industry. Research on managers' perspectives in UK hotels (Callan, 1997) involved assessing their views on how customers perceive the importance of various attributes when selecting a hotel and evaluating service quality. The findings suggest that while some leisure and security attributes are considered relatively unimportant, service provider-related attributes hold greater significance. Similarly, a study on UK hotel customers' perspectives (Callan, 1998) revealed that leisure, entertainment, and child-related services are not viewed as essential, reinforcing the emphasis on service-related attributes over leisure and security factors for both managers and customers.

Yang et al. (2003) explored the impact of unique service quality dimensions in internet retailing on consumer satisfaction. Their findings identified responsiveness, credibility, ease of use, reliability, and convenience as the most frequently cited service attributes contributing to customer satisfaction.

To optimize pricing strategies, hotel managers must understand the marginal utility customers associate with specific hotel attributes. Masiero et al. (2015) conducted a study using a stated choice experiment and discrete choice modeling to determine hotel guests' willingness to pay (WTP) for specific room attributes within a single hotel property. These attributes included room views, hotel floor, club access, complimentary mini-bar items, smartphone service, and cancellation policies. The study found that WTP values varied between leisure and business travelers, as well as between first-time and repeat visitors. These insights assist hotel managers in market segmentation and revenue management strategies to maximize profitability (Masiero et al., 2015).

As summary the SERVQUAL model, developed by Parasuraman, Zeithaml, and Berry (1988), remains one of the most influential frameworks in assessing service quality. Although foundational, its core principles continue to inform contemporary service quality research. According to the model, service quality is assessed by comparing customer expectations with their perceptions of actual service performance. These expectations are shaped by word-of-mouth communication, personal needs, and past experiences, while perceptions are influenced by tangible service characteristics such as responsiveness, assurance, empathy, reliability, and tangibles. This gap between expectations and perceptions—if negative—leads to perceived service quality deficits, which in turn contribute to customer dissatisfaction. When dissatisfaction occurs, it may manifest as negative word-of-mouth, online complaints, or switching behavior.

2.2. Online Reviews

The growth of online consumer reviews has been widely recognized over the past decade. To explore the motivations behind consumers expressing their opinions on web-based review platforms and social media, Hennig-Thurau et al. (2004) identified four key factors driving electronic word-of-mouth (e-WOM) behavior: the desire for social interaction, economic incentives, concern for other consumers, and the opportunity to enhance self-worth. Additionally, consumers engaging in e-WOM can be categorized based on the underlying motivations influencing their behavior (Hennig-Thurau et al., 2004).

To examine the impact of online reviews on consumer attitudes and behaviors, Browning et al. (2013) studied how online hotel reviews shape consumer perceptions of service quality and the extent to which businesses can manage service delivery. Their findings indicate that reviews focusing on core services are more likely to generate positive service quality perceptions, whereas negative reviews adversely affect consumers' opinions. The study emphasizes the importance of maintaining core service quality and the need for hotel managers to address customer service issues promptly (Browning et al., 2013).

Philips et al. (2017) proposed a model explaining which aspects of visitor experiences, as shared on social media, have the greatest influence on hotel demand. Their research highlights that hotel attributes

such as room quality, internet availability, and building conditions significantly impact hotel performance, with positive reviews having the strongest effect on customer demand (Phillips et al., 2017).Together, these insights underscore the importance for firms to tailor strategies for encouraging e-WOM behaviour and to prioritize the management of core services and positive customer experiences to optimize performance in the digital era.

2.3. Consumer Complaining Behaviour (CCB)

Customer complaint behavior is generally understood as a range of responses triggered by dissatisfaction with a purchase (Yuksel et al., 2006). In recent years, researchers have increasingly focused on the factors influencing consumer complaint intentions and behaviors. Crié (2003) classified consumer responses to dissatisfaction into two main categories: responses directed at an entity—public responses, such as complaints to the company, versus private responses, such as word of mouth—and behavioral versus non-behavioral actions, including legal action, doing nothing, or choosing to forget and forgive (Crié, 2003).

Gyung Kim et al. (2020) introduced a conceptual model outlining four coping strategies for managing stress caused by dissatisfaction: taking no action (inertia), engaging in negative word of mouth (negative WOM) against the service provider, directly complaining to the provider, or lodging a complaint with a third party (Gyung Kim et al., 2020). Research indicates that 32% of surveyed consumers would stop purchasing from a brand after a negative experience, even if they were previously loyal to it (Runge, 2024). The consequences of service failures become more severe when dissatisfied customers share their experiences on social media and online review platforms.

Sundaram et al. (1998) identified four key motives behind negative WOM: altruism (warning others to prevent similar issues), anxiety reduction, seeking vengeance, and requesting advice (Sundaram et al., 1998). To understand variations in online complaint behavior across different hotel categories, Sann et al. (2022) examined how guests at hotels with different star ratings express dissatisfaction. Their findings indicate that guests at higher-star-rating hotels are most likely to complain about service encounters in large hotels; value for money and service encounters in medium-sized hotels; and room space along with service encounters in small hotels (Sann et al., 2022).As a summery, hotel performance attributes play a crucial role in shaping guest experiences and determining overall satisfaction. These attributes, ranging from service quality and responsiveness to physical amenities, influence how customers perceive a hotel's value. The SERVQUAL model categorizes these attributes into five key dimensions: reliability, assurance, tangibles, empathy, and responsiveness. Among these, tangibles—including hotel facilities, cleanliness, and room conditions—have been identified as the most frequently criticized factors in negative online reviews. As online reviews continue to shape consumer decisions, understanding the aspects that lead to customer dissatisfaction is essential for hotel managers. Prior research highlights those different types of travellers value hotel attributes differently, with factors such as room views, location, and additional amenities affecting their willingness to pay. By analysing consumer complaints and their underlying motivations, hotels can better align their offerings with guest expectations, improve service delivery, and enhance customer loyalty.

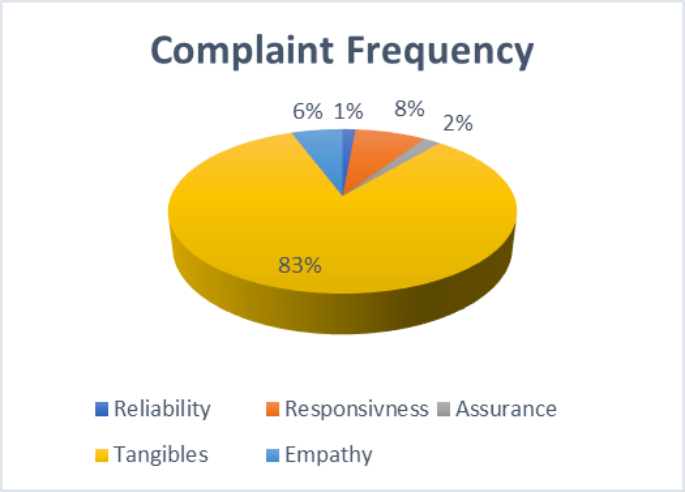
3. Data & Methodology

This study adopts an exploratory and inductive approach, utilizing content analysis of secondary data as its primary methodology. The data for this research is sourced from publicly available secondary data on Booking.com, covering the period from August 4, 2015, to August 3, 2017 (Kaggle.com). While the original dataset includes 515,000 customer reviews and ratings of 1,493 luxury hotels across Europe, this study focuses specifically on hotels in Italy.

From the dataset, 142 Italian hotels were identified; however, only 35 hotels with the highest number of negative reviews—ranging from 5,000 to 55,000 reviews—were selected for analysis. All selected hotels are chain-operated city center hotels. To evaluate the dimension of service attributes, SERVQUAL model has been used in this research. Accordingly, Reliability includes "Provide service on time and Without error". Assurance as trust and credibility, include "Competence, Courtesy, Credibility, and Security". Tangibles include "Physical facilities, the Appearance of the employees, Equipment, Machines, Cleanliness". Empathy is an essential attitude to serve every customer

individually and to increase their trust and loyalty. Empathy includes “Access (physical and social), Communication, Understanding the customer”. Finally, Responsiveness is defined by the length of time when customers wait for the answer or solution and include “Willingness and Promptness”.

Graph. 1 shows the frequency of complaints in service attributes according to SERVQUAL model in the database of hotels from Italy. From a total number of 37207 cases (negative online reviews), “Tangibles” has been mentioned in 83% of the cases and is the most critical service attribute that hotel customers complain about. Next, “Responsiveness” with 8%, “Empathy” with 6%, Assurance with 2% and finally “Reliability” with 1% represent the other service attributes which have been measured in the database.



Graph. 1. Complain Frequency in service attributes.

Source: Created by the author

Since the aim of this study is to investigate what hotel customers complain about mostly and to understand which hotel attributes are important for consumers, a qualitative data analysis software, QDA Miner, has been used to do a comprehensive content analysis on the negative online reviews. Table 1 shows examples of negative online reviews according to the most criticized scale namely “Tangibles of Service” with the frequency of the cases (online reviews) per each category.

Table 1: Tangibles of Service A (General categories)

Tangibles A -Categories and Frequencies of the cases (online reviews)	Examples
Hotel Physical Facilities (525)	-Hotel under staff Hotel and all FACILITIES are very old
	-Very basic amenities at the hotel No coffee or tea making FACILITIES
	-The room design and the FACILITIES are not good for the price
	-No tea coffee FACILITIES in the room Plugs are limited
Appearance of the employees (0)	
Equipment (64)	-Lack of plugs to recharge phones and other electronic EQUIPMENT
	-No ironing EQUIPMENT available
	-Kitchen in the room without basic EQUIPMENT
	-The quality of EQUIPMENT in room is poor
Machines (25)	-coffee MACHINES were out of order
	-some of hot drinks MACHINES in the breakfast room was out of order for my entire 5 day stay
	-lack of vending MACHINES
Cleanliness (70)	-CLEANLINESS Bad smell in room
	-For the star rating of this property the CLEANLINESS and housekeeping was very disappointing
	-CLEANLINESS around pool area was poor
Location (1267)	-LOCATION is out of town in an ex industrial district
	-The LOCATION is bad and far first night there were prostitutes near the hotel
	-The LOCATION is not good at all if you are looking for shopping it will take about 20 25 minutes to get to stores And also it is not great to live in the hotel near the railway station.
Design-Décor (3496)	See table 2
Room (30988)	See table 3

Source: Created by the author.

Table 2 shows examples of negative online reviews according to the most criticized scale namely "Tangibles of Service" with the frequency of the cases (online reviews) per each category of "Design-Décor".

Table 2: Tangibles of Service B (sub-categories of Design-Décor)

Tangibles B -Sub-Categories of **Design-Décor** and Frequencies of the cases (online reviews)	Examples
Fitness (78)	-The FITNESS center is quite small and has only one equipment for all muscles with missing handles
	-Not having any FITNESS facilities is a big minus in my opinion
	-The FITNESS room provided at their sister hotel was not worth the walk.
Elevator (261)	-The ELEVATOR is super small We could barely fit two people with our bags in it.
	-Speed of ELEVATOR are too slow
	-EVATOR was old and made a squeaky noise
Parking lot (953)	-PARKING is quite expensive.
	-The PARKING is at the remote site.
	-PARKING gate was broken
Restaurant (897)	-The small RESTAURANT in the hotel has a limited variety of foods and the prices are quite expensive
	-Limited range of options in hotel RESTAURANT
	- Rooftop bar was not open during my stay.
Bar (767)	-The lobby BAR is not working after 4 pm
	-Hotel BAR prices are too high
	-The BAR is too loud on the ground floor
Pool/Sauna (21)	-paying extra for SAUNA POOL facility
	-Children are not welcome in the SAUNA and POOL area
	-SAUNA and swimming POOL area can open for a little bit longer.
Taxi (217)	-on front desc call a TAXI for us to airport and the guy say it will cost you 70 euro but TAXI driver says 95 and we argue little.
	-To get a TAXI I had to carry my luggage by myself and also, I had to walk to find a TAXI as they could not stop close to the hotel

Lobby (302)	-Small LOBBY not much going around. -Loud music in the LOBBY -The LOBBY is one level below the street and we only have stairs access from outside to the LOBBY Potentially bring some trouble for the traveler with big luggage.

Source: Created by the author.

Table 3 shows examples of negative online reviews according to the most criticized scale namely "Tangibles of Service" with the frequency of the cases (online reviews) per each category of "Room".

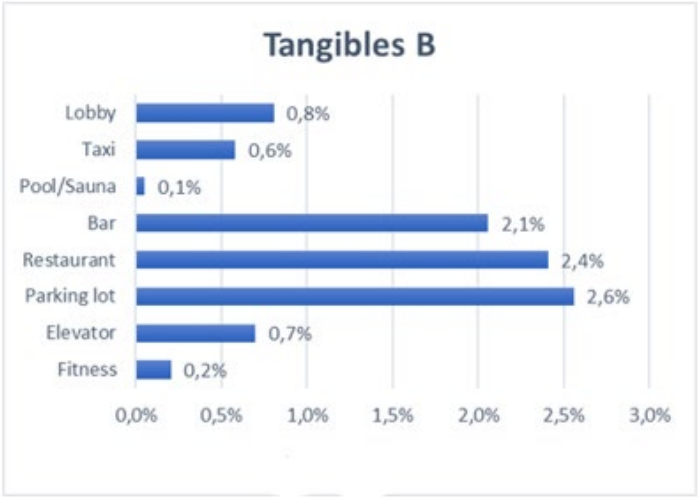
Table 3: Tangibles of Service C (sub-categories of Room)

Tangibles C -Sub-Categories of **Room** and Frequencies of the cases (online reviews)	Examples
• Room service (361)	Hotel has no room SERVICE at night -Room SERVICE was too expensive for what you get -The room SERVICE was very slow
• Bathroom (1352)	-There was an issue with hot water in the BATHROOM -The BATHROOM was soaked with water leaking out from the bath area we wasted 2 towels just to stop the soaking. -The BATHROOM had a huge patch of mold on the wall -The BATHROOM is quite small.
• Bed (1187)	-The BED is too old. -BED was too hard and pillows too low -BED sheets and pillowcases are made of rough material which gives an almost sandy feel -Double BED is made of two individual beds joined -The BED was tiny We were expecting queen size BED but what we got was just a half of it.
• Key (170)	-Room KEY card found to open several other rooms suggesting major security issues. -The KEY cards don't work you always have to ask the desk to get in your room. -KEY cards were very fussy particularly in elevators.
• Size (269)	-The SIZE of the shower is quite narrow, and I found my elbows kept hitting the walls. -The bed was small while we booked a king SIZE one -Some of rooms SIZE were Small

• TV Phone (573)	-No TV channels in English -TV was not working took staff 20 25 minutes to fix -Small TV with limited channels
• Internet (390)	-INTERNET was very slow -The INTERNET is paid in the room -Wifi password Had to type in every time you need to connect to INTERNET
• Chairs (59)	-The CHAIRS in tv room were uncomfortable -No CHAIRS on the balcony -Only 2 baby CHAIRS for such a big hotel
• Carpet (144)	-The carpet in the room was a bit grotty. -The smell of the CARPET dusty -The CARPET on the entrance was dirty.
• garderobe wardrobe shelfs (58)	-very small WARDROBE space to put your clothes -The WARDROBE door was glass and broken We did not use it because we were afraid of doing damage. -No WARDROBE just a hanging rail with not many hangers
• Air conditioner (141)	-Air CONDITIONER in the room was not operative. -The air CONDITIONER doesn't cool enough -Noise from rooms Kind of loud air CONDITIONER
• Windows (320)	-Room small and with little WINDOWS -WINDOWS insulation was not good in my room. -The WINDOWS were double, but you could hear everything from the street.
• Light (244)	-The LIGHT in the room is very dusky -The LIGHT switches were a puzzle -Reading LIGHT in room was broken Not enough electricity plugs -For solo female traveler the place kind of scary at night I mean inside the building too dark once you leave the elevator no LIGHT for the stairs nor the hallway

Source: Created by the author.

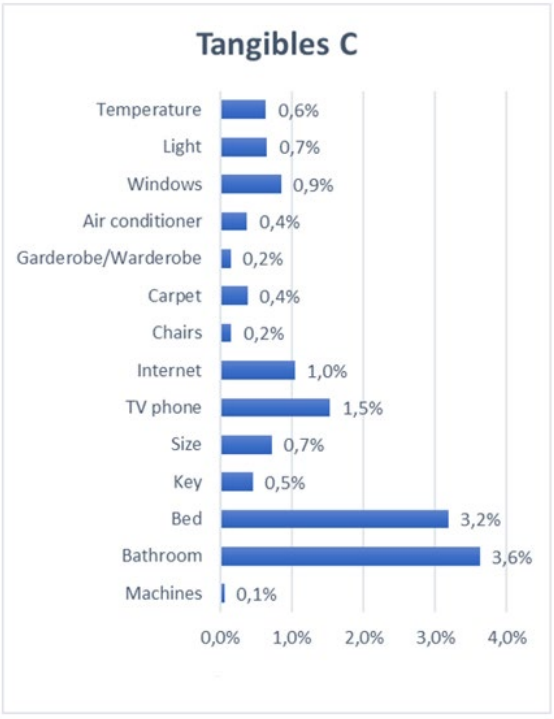
Graph. 2 shows the frequency of complaints in service attribute "Tangibles of Service" focusing on sub-categories of "Design-Décor". Ranking the data in order from high to low, Parking lot, Restaurant, Bar, Lobby, Elevator, Taxi, Fitness, and finally Pool/Sauna have been mentioned as complained attributes related to "Design-Décor" category.



Graph. 2 Frequency of complaints related to Tangibles of Service B (sub-categories of Design-Décor)

Source: Created by the author.

Graph. 3 shows the frequency of complaints in service attribute "Tangibles of Service" focusing on sub-categories of "Room".



Graph. 3 Frequency of complaints related to Tangibles of Service C (sub-categories of Room)

Source: Created by the author.

Ranking the data in order from high to low, Bathroom, Bed, TV/Phone, Internet, Windows, Light and Size of the room, Temperature, Key, Air conditioner and Carpet, Garderobe/Wardrobe and Chairs, and finally Machines have been mentioned as complained attributes related to “Room” category.

4. Findings and Discussion

This study used an inductive approach and the SERVQUAL model to evaluate negative customer reviews of 35 Italian hotels, highlighting the tangible aspects of service quality as the primary source of dissatisfaction. Among the 37,207 negative online reviews analyzed, 83% of complaints were related to tangibles, followed by responsiveness (8%), empathy (6%), assurance (2%), and reliability (1%). These findings reinforce previous studies (e.g., Albayrak et al., 2010; Oberoi & Hales, 1990) that emphasize the significant role of tangible elements—such as cleanliness, room conditions, equipment, and physical facilities—in shaping customer satisfaction in the hospitality sector.

The high frequency of complaints related to tangibles is consistent with the findings of Marić et al. (2016), who identified measurable and visible features of service environments as strong predictors of customer dissatisfaction when subpar. Furthermore, this study aligns with the work of Hu et al. (2019), who used topic modeling to reveal that hotel guests frequently express dissatisfaction with outdated facilities and poor maintenance in online reviews.

A deeper content analysis showed that within tangibles, room attributes such as bathroom conditions, bed quality, and room size were most frequently criticized, corroborating Masiero et al.’s (2015) findings that guests' willingness to pay is highly sensitive to in-room features. Similarly, location and noise levels, which emerged as additional pain points, are known contributors to negative word-of-mouth in the hospitality industry (Browning et al., 2013).

This study also supports the theoretical foundation of the SERVQUAL model: when service perceptions fall short of expectations, especially in tangible dimensions, customer dissatisfaction increases, often leading to public complaint behaviors via online platforms. These behaviors are not only emotional responses, but also strategic actions aimed at warning other consumers, as shown in the work of Sundaram et al. (1998).

In sum, the findings confirm the centrality of tangible service components in driving dissatisfaction and digital complaint behavior in hotel guests. Moreover, the integration of content analysis with SERVQUAL contributes methodologically by demonstrating how structured service models can be used in qualitative review mining

Overall, the study aims to understand consumers' primary complaints and the importance of various hotel attributes, providing valuable insights for hotel management to address service deficiencies and enhance customer satisfaction. Hotels cannot control online ratings and negative reviews, but they can evaluate and analyse them. This can provide insights that make it possible to provide better service quality, develop better offers, increase willingness to pay, and decrease gusts dissatisfaction (Fedewa, 2021).

5. Conclusion

This study investigated the dimensions of service quality that trigger customer dissatisfaction by analyzing negative online reviews of Italian hotels. By applying the SERVQUAL model, it was found that tangible service attributes overwhelmingly account for customer complaints, confirming the importance of physical and visible service features in the hospitality context.

The main contribution of this study lies in its empirical confirmation of SERVQUAL's applicability to large-scale, real-world review data. The work bridges the gap between theoretical service quality models and digital consumer feedback, demonstrating how user-generated content can be systematically categorized using established frameworks. Furthermore, the study offers practical implications for hotel managers, emphasizing the urgent need to address tangible service failures such as poor room conditions, equipment malfunction, and substandard cleanliness—factors most closely tied to customer dissatisfaction and subsequent online complaints.

From a theoretical standpoint, the study advances the understanding of complaint behavior as a function of expectation-perception gaps, aligning with prior literature but adding depth through a rich dataset of unfiltered customer voices. It also reaffirms the value of e-WOM as a powerful consequence of unmet service expectations.

While this study provides valuable insights, several areas warrant further investigation:

1. Cross-cultural comparisons: How do customer expectations and perceptions differ across cultures when evaluating service quality in hospitality?
2. Temporal changes: Do complaint patterns shift over time in response to changing guest expectations, especially in the post-COVID travel era?
3. Integration of Artificial Intelligence (AI) and machine learning: Can AI, automated sentiment and topic modeling be combined with SERVQUAL for real-time service monitoring?
4. The impact of managerial responses: How does the responsiveness of hotel management to online reviews influence future guest behavior?

Future studies could also expand beyond the SERVQUAL framework, incorporating emotional and experiential factors that are increasingly important in hospitality marketing.

Although many hotel companies have begun to analyze customers' complaint behavior, the industry has yet to fully explore the potential of this emerging data resource. One of the generally accepted marketing principles is that retaining existing customers and improving their re-purchases is more profitable than attracting prospective customers (Noone et al., 2011).

Gartner's research found that the role of customer service in increasing customer loyalty is critical, as 97% of customers are more likely to spread their positive opinion if they receive value during a service interaction (Gartner, 2024). To improve guests' satisfaction and prevent the potential risk of customers' negative online reviews, hospitality managers should closely monitor online complaints and understand why customers are dissatisfied with hotel services.

References

Albayrak, T., Caber, M., & Aksoy, S. (2010). Relationships of the tangible and intangible elements of tourism products with overall customer satisfaction. International Journal of Trade, Economics and Finance, 1(2), 140–143.

Alzaid, A. A., & Soliman, A. A. (2002). Service quality in Riyadh's elite hotels: Measurement and evaluation. King Saud University Journal (Administrative Sciences), 14(2), 83–103.

Browning, V., So, K. K. F., & Sparks, B. (2013). The influence of online reviews on consumers' attributions of service quality and control for service standards in hotels. Journal of Travel & Tourism Marketing, 30(1–2), 23–40. https://doi.org/10.1080/10548408.2013.750971

Callan, R. J. (1997). An attributional approach to hotel selection. Part 1: The managers' perceptions. Progress in Tourism and Hospitality Research, 3(4), 333–349. https://doi.org/10.1002/(SICI)1099-1603(199712)3:4<333::AID-PTH116>3.0.CO;2-C

Callan, R. J. (1998). An attributional approach to hotel selection. Part 2: The customers' perceptions. Progress in Tourism and Hospitality Research, 4(1), 67–84. https://doi.org/10.1002/(SICI)1099-1603(199803)4:1<67::AID-PTH131>3.0.CO;2-1

Crié, D. (2003). Consumers' complaint behaviour: Taxonomy, typology, and determinants: Towards a unified ontology. Journal of Database Marketing & Customer Strategy Management, 11(1), 60–79. https://doi.org/10.1057/palgrave.dbm.3240206

cswenson. (2021, April 15). How online reviews influence sales. Medill Spiegel Research Center. https://spiegel.medill.northwestern.edu/how-online-reviews-influence-sales/

Cunningham, P., Smyth, B., Wu, G., & Greene, D. (2010). Does TripAdvisor make hotels better?

Fedewa, D. (2021). Five-star growth: Using online ratings to design better products. McKinsey & Company. https://www.mckinsey.com/industries/consumer-packaged-goods/our-insights/five-star-growth-using-online-ratings-to-design-better-products

Gartner. (2024). How to improve customer loyalty and retention. Gartner. https://www.gartner.com/en/customer-service-support/insights/customer-loyalty

Gyung Kim, M., Wang, C., & Mattila, A. S. (2010). The relationship between consumer complaining behavior and service recovery: An integrative review. International Journal of Contemporary Hospitality Management, 22(7), 975–991. https://doi.org/10.1108/09596111011066635

Hennig-Thurau, T., Gwinner, K. P., Walsh, G., & Gremler, D. D. (2004). Electronic word-of-mouth via consumer-opinion platforms: What motivates consumers to articulate themselves on the Internet? Journal of Interactive Marketing, 18(1), 38–52. https://doi.org/10.1002/dir.10073

Hu, N., Zhang, T., Gao, B., & Bose, I. (2019). What do hotel customers complain about? Text analysis using structural topic model. Tourism Management, 72, 417–426. https://doi.org/10.1016/j.tourman.2019.01.002

Johnston, R. (1995). The zone of tolerance: Exploring the relationship between service transactions and satisfaction with the overall service. International Journal of Service Industry Management, 6(2), 46–61.

Kobiruzzaman, M. M. (2020, September 15). Five dimensions of service quality – SERVQUAL model of service quality. Newsmoor. https://newsmoor.com/servqual-model-five-key-service-dimensions-servqual-gaps-reasons/

Lockwood, A. J., Jones, P., & Bowen, A. (2004). UK hospitality and tourism SMEs: Differentiation by size, location, and owner style. Tourism Hospitality Planning & Development, 1(1), 7–11.

Masiero, L., Yoonjoung Heo, C., & Pan, B. (2015). Determining guests' willingness to pay for hotel room attributes with a discrete choice model. International Journal of Hospitality Management, 49, 117–124. https://doi.org/10.1016/j.ijhm.2015.06.001

Marić, D., et al. (2016). Analysis of tangible and intangible hotel service quality components. Industrija, 44(1).

Noone, B., McGuire, K., & Rohlfs, K. (2011). Social media meets hotel revenue management: Opportunities, issues, and unanswered questions. Journal of Revenue & Pricing Management, 10. https://doi.org/10.1057/rpm.2011.12

Oberoi, U., & Hales, C. (1990). Assessing the quality of the conference hotel service product: Towards an empirically based model. Service Industries Journal, 10(4), 700–721.

Parasuraman, A., Berry, L. L., & Zeithaml, V. (1985). A conceptual model of service quality and the implications for future research. Journal of Marketing Management, 49, 41–51.

Parasuraman, A., Zeithaml, V. A., & Berry, L. L. (1988). SERVQUAL: A multiple-item scale for measuring consumer perception of service quality. Journal of Retailing, 64(1), 35–48.

Phillips, P., Barnes, S., Zigan, K., & Schegg, R. (2017). Understanding the impact of online reviews on hotel performance: An empirical analysis. Journal of Travel Research, 56(2), 235–249. https://doi.org/10.1177/0047287516636481

Runge, J. (2024, January 5). Online review statistics you need to know for 2024. Gominga. https://gominga.com/online-review-statistics/

Sann, R., Lai, P.-C., Liaw, S.-Y., & Chen, C.-T. (2022). Predicting online complaining behavior in the hospitality industry: Application of big data analytics to online reviews. Sustainability, 14(3), Article 3. https://doi.org/10.3390/su14031800

Sundaram, D. S., Mitra, K., & Webster, C. (1998, January 1). Word-of-mouth communications: A motivational analysis. Advances in Consumer Research. https://openurl.ebsco.com/contentitem/gcd:83386489?sid=ebsco:plink:crawler&id=ebsco:gcd:83386489

Yang, Z., Peterson, R. T., & Cai, S. (2003). Service quality dimensions of internet retailing: An exploratory analysis. Journal of Services Marketing, 17(7), 685–700. https://doi.org/10.1108/08876040310501241

Yuksel, A., Kilinc, U., & Yuksel, F. (2006). Cross-national analysis of hotel customers' attitudes toward complaining and their complaining behaviours. Tourism Management, 27(1), 11–24. https://doi.org/10.1016/j.tourman.2004.07.007

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Sustainable development challenges in Georgian business

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Abstract

Sustainable development issues are becoming increasingly relevant in Georgia, with growing interest in companies engaged in sustainable business development. There is a rising curiosity about how these companies address the key challenges that Georgian businesses face on the path to sustainable development and how they resolve issues that could have a significant impact on their operations. Sustainable development encompasses economic and social aspects, meaning that growth should be both economically viable and socially just. This paper explores why businesses should adopt international sustainability standards, which provide a framework to balance environmental, social, and economic responsibilities. It also discusses innovative approaches and technologies that play a crucial role in achieving sustainability goals, particularly in the business sector. These innovations not only reduce negative environmental impacts but also create new opportunities and enhance competitiveness. Additionally, the paper examines Georgia's key business sectors and analyzes the cultural factors that should be considered when conducting business in the country. Special attention is given to the serious challenges that sustainable development faces in Georgia. The study outlines various risks present in the country that hinder sustainable progress for both businesses and the nation as a whole. Based on research findings, the paper provides recommendations for overcoming these challenges.

Keywords: Hotel Performance Attributes, Consumer Complaining Behavior, Online Review, SERVQUAL, Hospitality, Service
Jel Codes: L830, M300

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1. Introduction

The Global Goal for Sustainable Development includes topics such as poverty eradication, combating climate change, education, clean water and energy, gender equality, and more. For businesses, these goals can be used as a framework for strategy, initiatives, and communication. It is important for businesses to adopt international sustainability standards, which help them build long-term reputation, facilitate entry into international markets, gain investor trust, manage risks, and improve operational efficiency.

ISO 14001 – Environmental Management System Standard is a certifiable standard that can be used by both small and large businesses, helping organizations minimize their environmental impact.
GRI (Global Reporting Initiative) standards are the most widely used framework for sustainability reporting worldwide. Companies use GRI to disclose information about their economic, environmental, and social impacts.

SASB (Sustainability Accounting Standards Board) provides industry-specific sustainability indicators. It is particularly popular among investors, as it simplifies the comparison of companies from a sustainability perspective. TCFD (Task Force on Climate-related Financial Disclosures) focuses on financial risks caused by climate change and serves as a key framework for transparent reporting for investors and regulators.
International sustainability standards help companies develop sustainable strategies, manage risks, and achieve long-term success. Innovative approaches to sustainable development include Circular Economy, Green Design & Eco-Innovation, Carbon Footprint Management Systems.
Circular Economy aims for the efficient use of resources—reducing waste, recycling, and reusing materials. Examples include biodegradable packaging and the use of recycled raw materials in production. Companies design products that are easier to repair or disassemble for recycling.
Green Design & Eco-Innovation – From the initial design phase, products or services are developed with reduced environmental impact in mind. Examples include energy-efficient buildings, low-energy appliances, and the use of eco-friendly materials. Carbon Footprint Management Systems – Technologies that measure and reduce CO_2 and other greenhouse gas emissions. Climate-neutral production processes and carbon offset projects (e.g., tree planting, renewable energy initiatives) help minimize environmental impact.

2. Materials and methods

In the creation of the paper, the generally established principle of creating databases is used; Systematic information obtained from various Internet materials, works of Georgian and foreign scientists. Logical and comparative analysis. The article focuses on the serious challenges facing sustainable development in Georgia. It examines the main business sectors in Georgia, the economic and social context of Georgia, and the cultural factors that should be considered when doing business in Georgia. Recommendations are presented based on the research.

3. Results and discussion

Technologies that contribute to sustainable development include the following:
1. Renewable Energy Technologies – Solar, wind, hydro, and biomass energy sources. Solar panels and microgeneration systems are becoming increasingly popular among businesses and individual consumers.
2. Smart Technologies & IoT (Internet of Things) – Real-time monitoring of energy and resource consumption. Examples include smart thermostats, water consumption sensors, and advanced automation in industrial processes.
3. Artificial Intelligence (AI) & Data Analytics – Used for resource optimization, waste management improvement, and predictive analysis. AI helps analyze sustainability in logistics and supply chain management.

4. Blockchain for Transparency – Applied in supply chain tracking to ensure consumers have information about a product's origin and its environmental impact.
5. Green Building & Energy-Efficient Infrastructure
LEED and BREEAM Certified Buildings
Insulation, natural ventilation, LED lighting, and low-energy systems.
Several Georgian companies use solar panels in production. There are waste recycling initiatives (e.g., repurposing plastic in products). Agrotechnologies such as drip irrigation and smart field sensors are also being implemented.

Key Business Sectors in Georgia
The national economy encompasses a variety of interdependent sectors, each of which plays a significant role in the country's development. With the development of technological innovations, environmental considerations, and global market dynamics, these sectors are undergoing rapid transformation. This paper examines the main directions of development in several key sectors of the national economy, emphasizing the integration of sustainability, digitalization, and efficiency into the drivers of future growth.

Agriculture
Agriculture is the backbone of the national economy and plays a major role in the country's development. With the growth of the global population, the demand for food is increasing, which makes it necessary to find innovative solutions. In recent years, a number of programs have been introduced and are operating in Georgia, aimed at solving food security challenges. The essence of the initiatives is to reduce dependence on imports and promote the production of more non-GMO food in Georgia. (Rural Development Agency, n.d.).

Tourism
The most important economic characteristic of tourism-related activities is that they contribute to three high-priority goals of developing countries: income generation, employment, and foreign exchange earnings. In this regard, the tourism sector can play an important role as a driving force for economic development. (Organization of American States, n.d.) *Georgia has high potential for tourism development with its natural beauty, diverse topography, pleasant climate, unique cuisine, and rich culture and history.* (International Trade Administration, 2023) In order to promote tourism, the Georgian government has simplified the visa regime, increased the construction of highways, privatized amusement parks and hotels, and introduced limited tax incentives for tour operators. New developments have been implemented across the country - including in Batumi, Gudauri, Goderdzi, Bakuriani, and Mestia. Efforts are also underway in Kakheti to develop viticulture, which will attract visitors in the future. Against this backdrop, Georgia welcomed 9.4 million visitors in 2019, a record high and an 8% increase over 2018. Currently, one of the state-owned Partnership Co-Investment Funds (GCIF) is considering investment opportunities in tourism infrastructure in the Imereti, Adjara and Kakheti regions. (Forbes Georgia, 2023).

Construction
The construction sector is essential for economic growth in Georgia, regularly contributing around 8% to GDP. With a notable 14.8% growth in 2022 and an impressive 19% growth in the first half of 2023, it plays a crucial role in addressing the housing shortage, particularly due to the increase in demand from immigrants. Development is focused on increasing housing affordability, improving infrastructure and promoting sustainable construction practices. To support this growth, the government is increasing investment, improving regulations, providing financial incentives, encouraging foreign investment, and strengthening training and a strong workforce.

Energy

Energy is one of the country's strategic sectors and an important contributor to financial stability. **(Georgian Energy Development Fund,** 2024) In Georgia, energy is represented by almost all subsectors (thermal energy, hydropower, electricity and heating, oil extraction, oil refining and coal industry, thermal waters). Currently, there are many completed projects in Georgia's energy sector, as well as ongoing ones.

Logistics

Georgia's strategic geographical location makes it a major transit route for international trade, connecting Europe with Asia. The revival of the Silk Road and its involvement in projects that will connect China with Europe via Georgia will have a great impact not only on Georgia, but also on the world. To strengthen the logistics sector, attention should be paid to such things as the modernization of ports and railways and the expansion of their capabilities. Accordingly, more efficient and faster trade will be facilitated. Along with the Silk Road, we should also consider the Anaklia project, which, despite experiencing delays, is one of the most important, since it can increase Georgia's competitiveness and make Georgia a regional logistics center. According to the latest statistics, in 2023, the transport and warehousing sector accounted for 6.5% of Georgia's GDP, which emphasizes its economic importance. (PMCG, 2024).

Figure 1. Transport Network Map

Source: https://pmcg-i.com/research/transportation-and-logistics-sector-in-georgia/

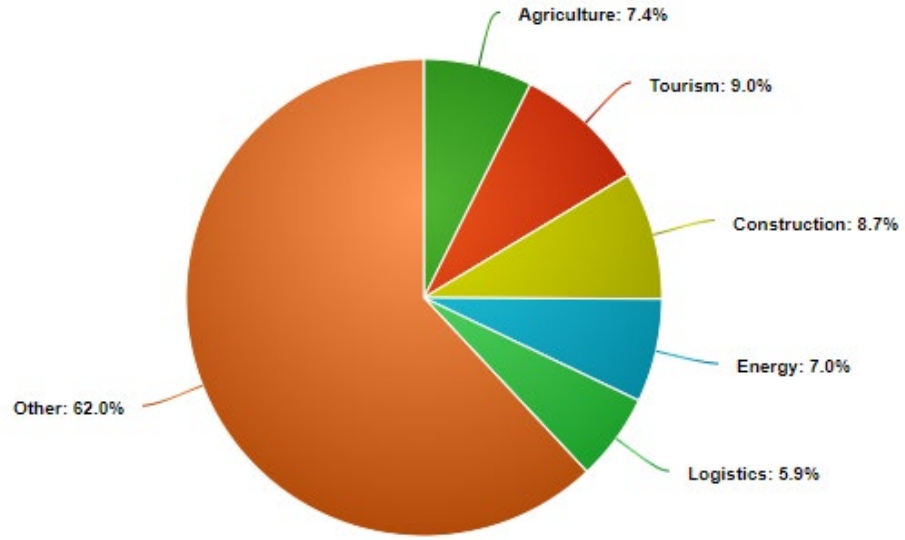

Figure 2. Share of Major Economic Sectors in Georgia's GDP

4. What is the economic and social context of Georgia?

Economic context

Georgia, located at the crossroads of Europe and Asia, has undergone a number of economic transformations in recent years. As of 2024, the country's GDP grew by 7.5%, driven by a growing trade sector and foreign investment. Financial reporting plays a crucial role in ensuring economic transparency, attracting investors, and supporting long-term sustainability.
A key factor in the Georgian economy is financial transparency. The introduction of International Financial Reporting Standards (IFRS) is expected to increase corporate accountability, helping businesses secure foreign investment.
The labor market has been on a positive trend, with the labor market showing improved job opportunities and, as a result, unemployment has fallen from 20.6% to a record low of 13.9% by June 2024. Financial reporting frameworks have contributed to this trend by ensuring the efficient functioning of companies. (World Bank, 2025).
According to the Organic Law of Georgia on the National Bank of Georgia (NBG), the primary mandate of the National Bank is to ensure price stability. The Constitution of Georgia (Article 68) and the Organic Law on the NBG (Article 4) grant the Central Bank full independence in conducting monetary policy to achieve this goal. Price stability is maintained by maintaining low and stable inflation, with an inflation target of 3% considered optimal for Georgia's exchange rate. (National Bank of Georgia, n.d.)

Social Context

The Demographics Focus Area examines household and population-related data, while the Economic Inequality Focus Area assesses inequality using indicators such as the GINI coefficient, poverty headcount, and poverty headcount across regions. The Social Progress Focus Area assesses various aspects of social well-being, including the World Press Freedom Index.
By 2025, Georgia's total population is expected to reach 3.81 million, with a Gini coefficient of 0.35. Approximately 3.80% of the population is expected to live on less than $2.15 a day, highlighting the urgent need for policies that support economic inclusion and help lift people out of poverty. While financial reporting alone cannot eliminate inequality, transparency in corporate profits, wages, and tax policies can help address socio-economic inequality.
By 2025, Georgia's employment rate is expected to increase to 62.96%, with an estimated 1.87 million people in the workforce. Labor productivity is projected to reach $11.29 per hour, indicating steady economic growth. As businesses integrate environmental, social, and governance (ESG) principles into their operations, strong financial reporting will be crucial. (Statista, 2025).

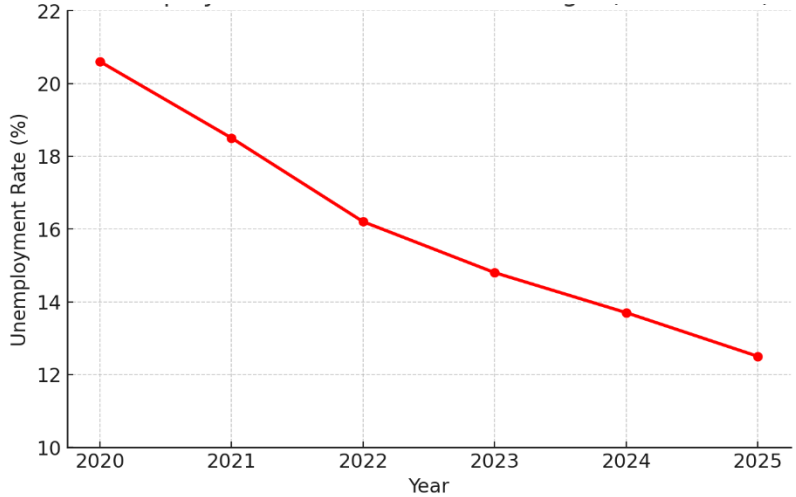

Figure 3. Unemployment Rate Decline in Georgia (2020-2025)

What cultural factors should you consider when doing business in Georgia?
Georgia is a country located at the crossroads of Europe and Asia, with a rich culture that plays a significant role in shaping its business environment. Understanding these cultural factors is crucial for effectively navigating business relationships in the Georgian market. Cultural factors include:

• Relationship-oriented business culture
Trust and personal connections are essential when building partnerships. Business discussions often begin with informal conversations and dinners, where building relationships is as important as discussing business issues. To become a trusted partner, you must demonstrate a genuine interest in fostering a strong business relationship.

• Respect for authority and age
Georgian culture places great importance on authority and respect for elders. Decisions are often made by one person, usually the business owner or manager, who has the final say. When dealing with such high-ranking individuals, it is important to show due respect and observe proper etiquette.

• Hospitality
Hospitality is a defining trait of Georgian culture, which extends even to business relationships. Business partners are often invited to dinner, where the hosts show warmth and friendliness. Much can be revealed during this gathering, including a person's courtesy, friendliness, and thoughtful responsiveness. Relationships are built around the table.

• Punctuality
Although business meetings in Georgia are usually scheduled in advance, punctuality is often flexible, especially in informal settings. Georgians enjoy talking before getting into business conversations, and avoiding it can sometimes be considered rude. However, they generally try to be punctual when dealing with foreign professionals as a sign of respect.

• Negotiations
Negotiations in Georgia can take time, primarily because people prefer to build trust and get to know each other before engaging in discussions. Before signing formal contracts, verbal agreements and guarantees from trusted individuals carry significant weight.

• Attitude towards foreign partners
Georgians are very open to foreign partnerships, valuing their experience and opinions. Foreigners are treated with great respect, and this often helps to quickly build trust and rapport. It is also very appreciated when foreigners show interest in Georgian culture, for example, learning a few words in the Georgian language, which arouses a sense of admiration among locals.

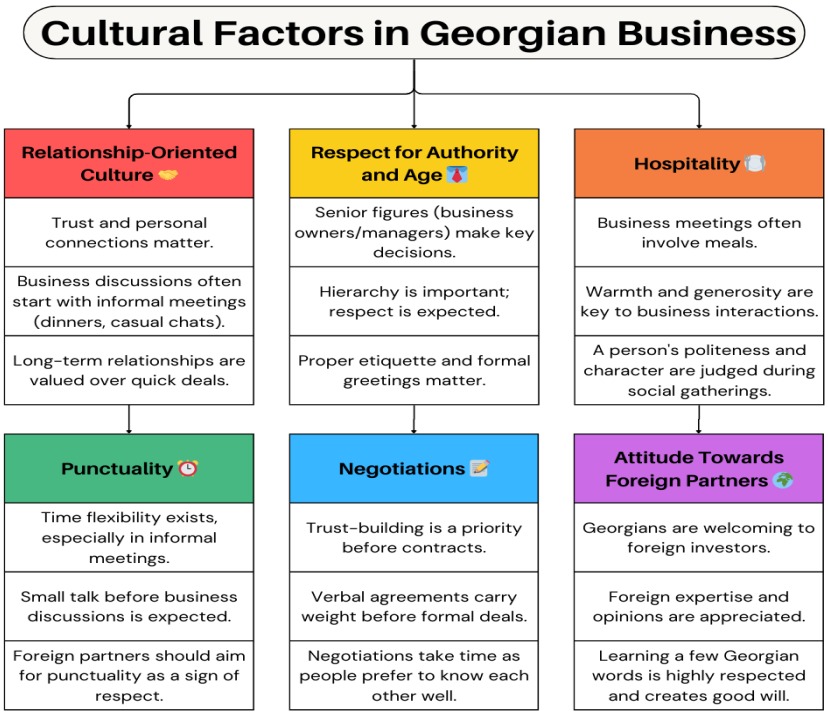

Figure 4. Cultural Factors in Georgian Business

Some Insights for Future in Georgia

For sustained economic growth, diversification of key sectors, integration of modern technologies and strengthening of investment policies should be carried out. In agriculture, organic production and agro-technological innovations should be promoted to increase productivity and reduce dependence on imports. Financial support for ecologically clean and non-GMO farming will strengthen agriculture and increase exports. For tourism, the best solution is to invest in eco-tourism, preserve and focus on cultural heritage, and concentrate on digital marketing strategies that will increase the number of visitors. Strengthening airports and transport links will further increase the competitiveness of the sector. In the construction industry, emphasis should be placed on affordable housing projects, green architecture and the construction and restoration of buildings outside the capital to encourage migration outside Tbilisi. In energy, Georgia should accelerate the adoption of renewable energy, especially hydropower, wind and solar power. Encouraging private partnerships and attracting foreign investment will reduce dependence on imported energy and strengthen domestic national security. In logistics, the revival of the historic Silk Road trade routes is a significant opportunity for Georgia. Given its historical and strategic location, the country can confidently become a regional leader. The Anaklia project will open new avenues for partnership with China. In modern logistics, investments in railway and port infrastructure will facilitate international trade and enhance Georgia's role in the global supply chain.
By implementing these measures, Georgia can rapidly grow its economy, achieve technological advancement and long-term stability. Sustainable development in Georgia faces certain challenges, and this process is accompanied by various types of risks that hinder the country and businesses from achieving sustainable progress.

The main risks related to sustainable development in Georgia include ecological, economic, social, institutional and governance risks, as well as regulatory and legislative risks.
Ecological risks are related to climate change, which has a significant impact on agriculture, access to water, and biodiversity; particularly in cities and industrial zones, the deterioration of air, water, and soil quality; unresolved waste management system—low recycling rates and inadequate landfill management.

Economic risks are associated with dependence on unsustainable sectors, particularly energy (especially fossil resources), low-tech agriculture, and the seasonality of tourism; lack of investment in green and innovative projects. Social risks include a high level of poverty in regions; informal employment, frequent violations of labor rights; gender and social inequality, especially in decision-making processes.

Institutional and governance risks involve the non-systematic implementation of sustainability policies—strategies exist, but practical implementation is delayed. Corruption risks, particularly in infrastructure projects and natural resource management; insufficient institutional coordination and lack of effective monitoring systems. Regulatory and legislative risks are associated with the creation of an unstable environment for businesses, as well as a low level of compliance with European standards, which hinders the country's integration and transition to a green economy.

Technological and innovative lag refers to the lack of innovative resources in regions and small businesses. Based on the research, the following recommendations are presented: a long-term strategic vision needs to be developed; there should be close cooperation between the private and public sectors; awareness should be raised among both citizens and businesses; financial and technological incentives should be provided for green and sustainable initiatives.

5. Conclusion

The concept of sustainable development has truly become a leading idea in modern society. Research shows that the main challenge for sustainable development in Georgian business is insufficient awareness and education. Many companies lack adequate knowledge of sustainable development principles (ecological, social, and economic balance).

CSR (Corporate Social Responsibility) – this business model, in which a company’s economic, social, and environmental interests are balanced as much as possible, is often perceived as a mere formality.
Another challenge for sustainable development in Georgian business is financial constraints. Implementing environmentally friendly technologies is often expensive for small and medium-sized businesses. There is a lack of green investments and financial instruments that are difficult to access. Companies that adopt sustainable practices receive insufficient incentives.

One of the key challenges for sustainable development in Georgian business is market demand and the absence of monitoring and evaluation systems. The local market does not yet actively demand environmentally friendly products or green business practices. This highlights the need for information campaigns on green business practices and supporting tools (technical and financial).

The requirement to comply with international standards should apply not only to export-oriented companies but to all businesses. Many companies lack systems to assess their impact on the environment, society, and the economy, which means there is a lack of ESG (Environmental, Social, Governance) indicators. A proper, systematic assessment of ESG factors and their strategic use helps companies gain a new perspective on sustainable development in Georgian business, as well as improve operations and stakeholder reporting.

Sustainable development is closely linked to business risks and, most importantly, to new opportunities and challenges. Working on a company's sustainability strategy based on the analysis of risks, opportunities, and challenges means viewing business from a different perspective and considering aspects such as technology and innovation. Innovative approaches and technologies contribute to sustainable development, which should be more widely utilized in Georgia. There is a need to raise awareness, share academic and practical knowledge, support small and medium-sized businesses through state and donor programs, foster active cooperation with international organizations, and encourage green initiatives. Additionally, it is crucial to implement ESG strategies and ensure transparent reporting.

References

Forbes Georgia. (2023). Indicators and trends of the Georgian construction sector.. Available at: <https://forbes.ge/saqarthvelos-samsheneblo-seqtoris-machveneblebi-da-tendentsiebi/> [Accessed on April 2025].

Georgian Energy Development Fund. 2024. Presentation of energy sector research results. Available at: <https://gedf.ge/ka/n/news/energetikis_sektoris_kvlevis_shedegebis_prezentatsia> [Accessed on April 2025].

International Trade Administration, 2023 Georgia - Tourism. U.S. Department of Commerce. Available at: <https://www.trade.gov/country-commercial-guides/georgia-tourism> [Accessed on April 2025].

National Bank of Georgia, n.d. Monetary Policy. Available at: <https://nbg.gov.ge/en/page/monetary-policy> [Accessed on April 2025].

Organization of American States, n.d. Annex 2. Tourism as an Economic Development Tool. Available at: <https://www.oas.org/Dsd/Publications/Unit/Oea78e/ch10.htm> [Accessed on April 2025].

PMCG, 2024. Transportation and Logistics Sector in Georgia. [online] Available at: <https://pmcg-i.com/research/transportation-and-logistics-sector-in-georgia/> [Accessed on April 2025].

Rural Development Agency, n.d. Programs. Available at: <https://www.rda.gov.ge/programs> [Accessed on April 2025].

Statista, 2025 Socioeconomic Indicators – Georgia. Available at: <https://www.statista.com/outlook/co/socioeconomic-indicators/georgia> [Accessed on April 2025].

World Bank, 2025. Georgia Overview: Development news, research, data. Available at: <https://www.worldbank.org/en/country/georgia/overview> [Accessed on April 2025].

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European Union consumer inflation expectations in macro panels

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Abstract

Paper investigates the role of consumer inflation expectations in macroeconomic variable dynamics within select European Union countries from 2004Q1 to 2024Q3, employing a panel vector autoregression (PVAR) model. The empirical analysis compares two approaches: balance statistics and various configurations of the Carlson-Parkin quantification method, studying variations in inferred dynamics dependent upon methodological selection. The results indicate that consumer inflation expectations modestly influence aggregate demand and inflation, consistent with intertemporal substitution effects. However, the anticipated wage-price spiral was largely absent, and the relationship between unemployment and inflation was weaker than traditional Phillips curve frameworks would predict, suggesting structural factors or unemployment rates above the natural unemployment rate. Furthermore, macroeconomic relationships found, particularly concerning consumer sentiment are dependent on methodological choices. Lastly, heterogeneity in dynamics between different countries is analysed. This heterogeneity underscores the value of country-specific analysis for understanding the transmission of inflation expectations to macroeconomic outcomes.
Keywords: Consumer inflation expectations, balance statistics, Carlson-Parkin method, survey data.
Jel Codes: C49, D84, E58

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1. Introduction

Understanding inflation expectations has become critically important following the global inflationary episode that began in 2021, prompting renewed interest in their role within monetary policy frameworks. Traditionally viewed as crucial within modern macroeconomic frameworks, inflation expectations are theorized to influence actual inflation through aggregate demand and price-setting mechanisms. However, recent literature indicates significant ambiguity concerning the strength and persistence of these relationships, especially concerning the expectations of consumers. Therefore, this study addresses three interrelated research objectives. Firstly, the study aims to empirically assess how consumer inflation expectations influence key macroeconomic variables across EU countries using a panel vector autoregression (PVAR) framework. Secondly, this research addresses methodological gaps by comparing commonly used balance statistics and different specifications of quantified expectations (Carlson-Parkin approach). Specifically, it critically evaluates whether the relationships identified are sensitive to different configurations of the Carlson-Parkin method. By systematically comparing multiple quantification specifications, the study sheds new light on the robustness of empirical conclusions on macroeconomic relationship inference, especially concerning consumer sentiment channel, and underscores the importance of methodological rigor when incorporating consumer expectations into macroeconomic analysis and policy recommendations. Thirdly, heterogeneity of inflation expectations effects to economy is checked on individual country level. While some studies focus on aggregate region data, such as euro area or EU, other studies focus on individual countries. The results of this study suggest that there is a considerable amount of heterogeneity between different countries suggesting that aggregate approaches may obscure important cross-country differences.

2. Literature Review

In mid 2021 an inflation surge had countries experiencing highest levels of inflation seen in decades. Economists were attributing many reasons for this increase with the main ones revolving around covid supply chain disruptions, stimulus during the pandemic and, later, the war in Ukraine leading to high energy prices. Around the same time Rudd (2021) published a paper on inflation expectations which got a lot of attention not only in the academic community but also in the media. In this paper, the author explains how inflation expectations are paramount to modern macroeconomic and monetary policy theories. In addition to discussing the relevant theoretical aspects, Rudd also critically reviews empirical evidence for inflation expectations effect to actual inflation. The paper concludes that the theoretical foundations are not sound as there is not enough empirical evidence justifying the importance of inflation expectations. The relationship between inflation expectations and actual inflation is only circumstantial. In fact, academic literature predominantly modelled inflation expectations under rational expectations framework using multiple approaches. The early econometric approaches to estimating inflation expectations were centred around adaptive expectations and use vector autoregression models (Roberts, 1998). However, the use of such approach had its limitations, namely, such models could not explain non-linearities and volatility of expectations as well as changes in behaviours during turbulent periods. Another shortcoming of such approach was the limited treatment of perceived inflation in formation of consumer expectations. An alternative measure of consumer inflation expectations relied on survey-based methods. While these surveys provided valuable insights into heterogeneity in expectations, they often revealed persistent deviations from rationality, such as underreaction to new information and strong anchoring on past inflation (Carroll, 2003). This gap led to a stylized but incomplete understanding of expectation formation. Therefore, the need for research that incorporated behavioural elements and subjective perceptions combined with the relevancy of inflation expectations during an inflation surge period, spurred a number of research papers on inflation expectations.

Verbrugge and Zaman (2021) paper on US inflation expectations point out that consumer expectations have significant differences to professional forecasters and business expectations. They also show that consumer inflation expectations are a much worse predictor of actual inflation. Weber, Coibion and Gorodnichenko (2023) study household level data on US consumers to find a link between perceived and expected inflation challenging the link between consumer expectations and actual inflation. The researchers also indicate, that during the inflation surge, the heterogeneity of expectations also rises. Huber, Minina, Schmidt (2023) employ a RCT and establish a causal relationship between consumer inflation perceptions and expectations using data on German households. Since it is well documented

that consumer inflation perceptions are highly heterogenous and biased, it raises serious concerns about the inflation expectations relation to and effect to actual inflation. Bachmann, Berg and Sims (2015) study on US household readiness to spend indicate that higher inflation expectations had negative effect on spending decisions in a near zero lower bound environment and had no effect otherwise. In other words, when operating at zero lower bound and increase in expected inflation results in lower aggregate demand exerting downward pressure to actual inflation. The authors indicated though that the results vary in accordance with the attributes of households. Those households whose inflation expectations were closer to actual ex-post inflation rate did operate more in line with economic theory and Euler's equation used in macroeconomic models. On the other hand, a study on euro area household by Duca, Kenny and Reuter (2021) found some contrary results. The authors find a positive relationship between inflation expectations and household spending. What is more, the effect is found to be stronger at when the interest rates are close to zero. Duca et al. (2021) postulate that increase in inflation expectations can lead to substantial increases in aggregate consumption, especially when the lower bound on interest rates is binding. Country level data is consistent with the study on households; however, researchers indicate that there is a degree of heterogeneity among countries that could arise due to differences in economic structure and consumer behaviours. Rondinelli and Zizza (2020) research on Italian households indicate that the effect of inflation expectations might depend on the inflation level itself. The authors found that during high inflation regime, consumers with higher inflation expectations are more likely to increase their current spending compared to future spending. This suggests that the main channel through which inflation expectations affect aggregate demand was dominated by intertemporal substitution effect. However, during a low inflation regime, households with higher inflation expectations had lower propensity to spend, indicating that income effect was the dominant mechanism. While the body of work on consumer inflation expectations is growing, there is still ambiguity on the effects of it to inflation. The aim of this paper is to shed some light on the relationship of consumer inflation expectations to other macroeconomic variables in EU countries.

What is more, the study of consumer inflation expectations presents inherent challenges that complicate empirical analysis due to the nature of how consumers expectations are measured. The primary method for obtaining data on consumer inflation expectations are surveys with the most famous ones being University of Michigan Surveys of Consumers for US households and European Commission Consumer Surveys for EU households. Households are asked questions of both qualitative and quantitative nature pertaining to their beliefs about inflation in 12 months time. While the quantitative responses are ready to use in studies, issues concerning these responses have long been documented in the literature. Firstly, households consistently overestimate inflation with their quantitative responses (both the expectations and the perception of it); hence, it might not be a reliable measure and some researchers prefer qualitative responses (Arioli et al., 2017; Rutkowska and Szyszko, 2021). What is more, response rate of qualitative responses are generally higher allowing for a more comprehensive survey data (Pesaran and Weale, 2005). However, qualitative responses cannot be directly utilized for studying and modelling inflation expectations in the same manner as quantitative responses. Therefore, researchers usually need to quantify the qualitative expectations data by utilizing mapping methods. The most commonly employed methods in research are the balance method (i.e. balance statistics) and the probability method (e.g. Carlson-Parkin, Batchelor-Orr methods). Although there are studies examining specific methods and their underlying assumptions, there is a lack of academic literature comparing the implications of method selection. Therefore, in this study I aim to use both methods, namely, balance statistics and quantified expectations using Carlson-Parkin approach, and compare whether this choice has any significant implications on the relationship found between inflation expectations and other macroeconomic variables as well as dynamics of it.

Lastly, while some studies (e.g. Duca et al., 2021) focus on multi-country research, some studies focus on single country data. However, a question remains whether study of inflation expectations on multi-country data is beneficial as there is evidence in the academic literature emphasising country differences in inflation as well as inflation expectations dynamics (Kucerova, Paksi and Konarik, 2024; Panagiotis and Argyrios, 2023; Szyszko and Rutkowska, 2019). Therefore, it is beneficial to test whether studying individual country data can produce considerably different results to a study in a panel data setting.

3. Method

To analyse the dynamic relationships between macroeconomic variables, especially inflation expectations relation to other variables, I employ a Panel Vector Autoregression (PVAR) model. The choice of the method is motivated by the fact that the variables analysed are interdependent and the use of VAR allows modelling of such intertemporal dependencies. At first, PVAR with Fixed Effects is estimated using OLS, however, it has been documented that such models can suffer from endogeneity issues, namely, Nickell bias (Nickell, 1981). This bias is especially critical in cases when the longitudinal dimension (T) is small. While the data used in this research is quarterly from 2004Q1 to 2024Q3 for 26 countries , some of the countries do not record observations for some of the variables from the beginning of the sample and the panel is unbalanced. The maximum T observations per country are 79 with the average of 65 observations. The choice of the countries is motivated by the fact that survey questions within them are harmonised and allow for comparability when assessing consumer inflation expectations. Nickell bias should not be substantial due to sufficient observations, yet it will be tested by evaluating a second PVAR model using the two-step Generalized Method of Moments (GMM) as described by Sigmund and Ferstl (2017). The specific form of the model estimation is system GMM, first described by Blundell & Bond (1998). Comparing the coefficients of the two models allows to assess the severity of endogeneity problem with the OLS model. The use of GMM does have its' own issues. The method uses lagged variables as instruments and can generate a large quantity of them leading to overfitting. In order to check for it, Hansen J test is performed to check the instrument validity. What is more, GMM is iterative making the method computationally intensive and given the sample, the lags included in the model need to be limited. Lastly, if the bias in the OLS PVAR model is not significant, GMM model can have significantly larger standard errors of the coefficients, making the variance-bias trade-off not a worthwhile one. General form of the PVAR model is given by:

$$Yi,t = \Gamma 1 Yi,t\text{-}1 + \Gamma 2 Yi,t\text{-}2 + \cdots + \Gamma p Yi,t\text{-}p + \Phi Xi,t + \alpha i + \varepsilon i,t \quad (1)$$

where: Yi,t is a vector of endogenous variables for country i at time t; Γj represents the coefficient matrices for lagged endogenous variables up to lag p; Xi,t is a vector of exogenous control variables (if included); Φ is the coefficient matrix associated with exogenous variables; αi captures country-specific fixed effects; εi,t is the error term.

$$Y_{i,t} = \begin{bmatrix} C_{i,t} \\ Y_{i,t} \\ G_{i,t} \\ L_{i,t} \\ \pi_{i,t} \\ U_{i,t} \\ \pi^{e}_{i,t} \\ i_{i,t} \\ D_{i,t} \\ W_{i,t} \\ E_{i,t} \\ S_{i,t} \end{bmatrix} \quad (2)$$

where Ci,t is YoY percentage change in real consumption (CONS_YOY); Yi,t – YoY percentage change in real GDP (RGDP_YOY); Gi,t - YoY percentage change in government spending (GS_YOY); Li,t - YoY percentage change in loans (LOANS_YOY); πi,t – YoY change in inflation rate (PI_YOY); Ui,t - YoY change in unemployment rate (UN_YOY); πei,t - YoY change in inflation expectations (BS_YOY or PI_EXP_YOY); ii,t - YoY change in interest rate, EURIBOR 3M or equivalent for non-euro area countries (i_YOY); Di,t - YoY percentage change in household deposits (DEPOSITS_YOY); Wi,t - YoY percentage change in average wage (WAGES_YOY); Ei,t - YoY percentage change in

energy prices (ENERGY_YOY); Si,t - YoY change in consumer confidence index (CCI_YOY). While the use of Year-over-Year (YoY) change variables ensure stationarity (Table 2 for Choi's modified unit root test), such choice is also beneficial in reducing the lags required to include in the computationally intensive GMM model to ensure appropriate residual serial correlation. The motivation is also supported by the AIC of the models (Lag 1 model AIC -640.18, Lag 2 model AIC -616.77). The choice of the variables is motivated by the channels through which inflation expectations are theorized or measured to affect economies. For inflation expectations two different measures will be used – change in balance statistics of qualitative consumer responses to European Commission survey and quantitative year-ahead consumer inflation expectations quantified using canonical form of Carlson-Parkin method (See Berk (1999); Millet (2006); Lyziak (2013) for elaborate description of the method). The lag order of one is used and the system of equations are as per below:

$$
\begin{aligned}
Ci,t &= \gamma 11 Ci,t\text{-}1 + \gamma 12 Yi,t\text{-}1 + \cdots + \gamma 1,12 Si,t\text{-}1 + \alpha 1i + \varepsilon 1,t \\
Yi,t &= \gamma 21 Ci,t\text{-}1 + \gamma 22 Yi,t\text{-}1 + \cdots + \gamma 2,12 Si,t\text{-}1 + \alpha 2i + \varepsilon 2,t \\
Gi,t &= \gamma 31 Ci,t\text{-}1 + \gamma 32 Yi,t\text{-}1 + \cdots + \gamma 3,12 Si,t\text{-}1 + \alpha 3i + \varepsilon 3,t \\
Li,t &= \gamma 41 Ci,t\text{-}1 + \gamma 42 Yi,t\text{-}1 + \cdots + \gamma 4,12 Si,t\text{-}1 + \alpha 4i + \varepsilon 4,t \\
\pi i,t &= \gamma 51 Ci,t\text{-}1 + \gamma 52 Yi,t\text{-}1 + \cdots + \gamma 5,12 Si,t\text{-}1 + \alpha 5i + \varepsilon 5,t \\
Ui,t &= \gamma 61 Ci,t\text{-}1 + \gamma 62 Yi,t\text{-}1 + \cdots + \gamma 6,12 Si,t\text{-}1 + \alpha 6i + \varepsilon 6,t \,\# \\
\pi\text{^e } i,t &= \gamma 71 Ci,t\text{-}1 + \gamma 72 Yi,t\text{-}1 + \cdots + \gamma 7,12 Si,t\text{-}1 + \alpha 7i + \varepsilon 7,t \\
ii,t &= \gamma 81 Ci,t\text{-}1 + \gamma 82 Yi,t\text{-}1 + \cdots + \gamma 8,12 Si,t\text{-}1 + \alpha 8i + \varepsilon 8,t \\
Di,t &= \gamma 91 Ci,t\text{-}1 + \gamma 92 Yi,t\text{-}1 + \cdots + \gamma 9,12 Si,t\text{-}1 + \alpha 9i + \varepsilon 9,t \\
Wi,t &= \gamma 10,1 Ci,t\text{-}1 + \gamma 10,2 Yi,t\text{-}1 + \cdots + \gamma 10,12 Si,t\text{-}1 + \alpha 10i + \varepsilon 10,t \\
Ei,t &= \gamma 11,1 Ci,t\text{-}1 + \gamma 11,2 Yi,t\text{-}1 + \cdots + \gamma 11,12 Si,t\text{-}1 + \alpha 11i + \varepsilon 11,t \\
Si,t &= \gamma 12,1 Ci,t\text{-}1 + \gamma 12,2 Yi,t\text{-}1 + \cdots + \gamma 12,12 Si,t\text{-}1 + \alpha 12i + \varepsilon 12,t
\end{aligned}
\tag{3}
$$

4. Results

The first results discussed are when using balance statistics of consumer responses (BS_YOY). The coefficients obtained after estimating OLS fixed effects PVAR can be found in Table 3 and impulse response functions are provided in Figures 1-12. However, before discussing the results it is important to assess whether OLS estimated are affected by endogeneity. Therefore, the coefficients can be compared to GMM PVAR model (Table 4).

First of all, comparison of the results reveals some significant differences in coefficients. OLS fixed effects PVAR model coefficient estimates are larger for several of the equations. The difference in magnitude is substantial enough that the coefficient becomes statistically insignificant in GMM model for some variables. Examples of this can be found with lagged real GDP growth (RGDP_YOY) effect on inflation expectations (BS_YOY) (0.5080, significant at $p < 0.001$ vs. 0.0466, significant at only $p < 0.05$) and government spending (GS_YOY) (0.1383, significant at $p < 0.01$ vs. -0.0156 with $p > 0.05$). As the focus of this research is on inflation expectations, notable differences in coefficient estimates can be found in lagged inflation expectations effect on other macroeconomic variables as well. While OLS estimates significant effect for consumption, loans, unemployment rate, interest rates and consumer confidence index, GMM estimates are insignificant; however, the effects in the OLS model are rather limited and the change in significance level can be attributed to higher standard errors in the GMM model. Mainly, OLS models variables as more persistent than GMM, but GMM model estimates have significantly higher standard errors as expected. Hansen J test for GMM model fails to reject H0 (p-value > 0.1) suggesting that the instruments used in GMM estimation are valid. However, this test should be taken with a grain of salt as the amount of variables used leads to a large number of

instruments that can weaken the reliability of the estimates. Impulse response functions of GMM model can be found in Figures 13-24. Both the results of IRFs and coefficient significance point toward overparameterization, suggesting that GMM approach might not be more reliable than OLS results in this case where a model contains more than a few endogenous variables.

The impulse of the indicated variable is of one standard deviation impulse of the indicated variable. As per OLS model results, a shock in real consumption growth exhibits an immediate and strong positive response of approximately 3.67 p.p. in the first period and is quite persistent with the positive effect gradually decreasing to near-zero after about 6 quarters in the OLS model. Substantial responses are also found in real GDP growth increase (2.2 p.p.) with the effect lasting around 4 quarters, a decline in unemployment (-0.22 p.p.) converging to previous level in about 5-6 quarters, a mild but persistent (> 8 quarters) hump shaped positive response in inflation (0.56 p.p.) peaking at 4 quarters past the initial shock and a hump shaped response in energy prices reaching the peak (2.37 p.p.) in about 2-3 quarters. These responses to the real consumption growth shock are not surprising as they are in line with demand-side theories. Household loans experience a slight increase as a response to shock, however, it might be that households finance increased consumption via borrowing channel. When it comes to changes in consumer inflation expectations and confidence index, it can be observed that inflation expectations experience a hump shaped response with an initial increase (1.37 units) peaking with a one quarter delay (2.32 units) with the effect approaching zero in around 5 quarters. The effect, however, turns negative and significant in the longer horizon (>6 quarters). Such response suggests that consumer inflation expectations react to the shock with a bit of a delay to initial shock. This can happen due to several reasons. One of the possible explanations could rely on delay in information publicly available where some of the consumers react with a lag compared to others thus resulting in a hump shaped response. This could also happen if the consumer responses on inflation expectations react sensitively to increases in price levels, namely, change in inflation and energy prices in the case of this model. The return to previous expectations levels might indicate adjustment to the persistent increase in both of those price level variables. Both reasons are valid as they are widely discussed in the economic literature. Consumer confidence index reacts to the shock in a similar fashion, but there is not hump in the reaction of it and the initial effect (1.64 units) tapers off at around second quarter. There is also a slight negative effect in the long term (> 4 quarters), but it is negligible. The GMM model, however, does not suggest such persistence of most of the variables. While the initial effect of one standard deviation shock to real consumption growth is stronger in GMM model (4.35 p.p.) it is not as persistent as it diminishes to zero in 2-3 quarters. Similar situation is indicated with real GDP growth – stronger initial reaction (3.41 p.p.) but the effect tapers off in 2-3 quarters. Overall, the IRFs of GMM model have large standard errors, therefore, the 95% confidence interval for the responses of other variables includes zero, meaning that the effect found is not statistically significant. Consumer inflation expectations and confidence index are a bit more persistent than the OLS model suggests, but as mentioned, insignificant at the 5% level. The dynamics of responses to a shock in real GDP growth are analogous to responses to a shock in real consumption growth in both models. Slight differences arise in the magnitude of the responses. OLS model suggests that a shock to RGDP_YOY results in a 2.87 p.p. initial response in real consumption and 2.81 p.p. in real GDP growth lasting up to 6-7 quarters. Response of change in consumer inflation expectations are 1.34 units in the initial period, peaking at 2.6 units. GMM model suggests an initial response to the change in real consumption growth of 2.38 p.p. and 6.25 p.p. for real GDP growth.

When considering a positive shock to government spending, the responses of the other macroeconomic variables are much less pronounced. OLS PVAR model results indicate that in the case of a one standard deviation shock to GS_YOU, real consumption growth responds with around 0.37 p.p. initial increase with the effects peaking in 2-3 quarters (0.5 p.p.) after the shock and lasting up to 6 quarters. This suggests that increased government spending has a stimulative effect on consumer demand. Real GDP growth exhibits a comparable response dynamic with a slightly lower magnitude. The government spending growth itself is indicated as persistent with the initial response of 3.87 p.p. and lasting around 8 quarters. There is a minor effect of the shock on wages growth peaking in 2-3 quarters (0.7 p.p.), however such results are most likely obtained since part of the government spending is associated with wages of employees in the public sector rather than the mechanism of the shock transmission itself. Growth of household loans appear to have a significant response as well. Yet, the confidence interval is rather wide implying that the effect of government spending on household debt might vary. Other

variables do not have statistically significant responses suggesting limited transmission mechanisms of government spending shocks. GMM model results indicate that that a shock in government spending only significantly affects wage growth.

OLS model results show that a shock in YOY inflation is indicated as highly persistent lasting longer than 8 quarters. Responses from real consumption growth and real GDP growth are more likely to be one of the causes for the inflation increase through aggregate demand channels rather than responding to an increase in price level. Similar can be said about energy prices – it is more likely that an unexpected increase in the energy prices is the cause of inflation shock rather than the other way around. Wages do not initially respond to a shock in inflation – significant responses are only indicated in about 3-4 quarters after then initial shock. However, even then the response is very mild (around 0.25 p.p.) and far less than the inflation shock. This suggests that in the time period analysed the wage-price spiral was not a prominent shock transmission mechanism. These results are corroborated by response in household deposits. There is no initial response in the change of household deposits after the shock, but a significant negative effect appears in about 2-3 quarters (-0.25 p.p.) and persists long term (about -0.67 p.p. 8 quarters after the shock). This hints that unexpected rise in prices is offset by household savings. Initially consumer inflation expectations increase (3.39 units) as a response to the shock, but after 3 quarters from the initial shock expectations come back to the level before it. In the longer horizon this shock has a negative impact on expectations (-2 units) suggesting that consumers adjust to new price level quickly and expect it to return to previous levels in the long term. Consumer confidence index reacts negatively (-1.1 unit) to a positive inflation shock but returns to previous levels in 6 quarters.

An unexpected increase in the unemployment level is persistent and lasts up to 8 quarters. As expected in economic theory, such shock has strong negative responses of real consumption and real GDP growth (-1.28 p.p. and -1.1 p.p. initial responses, respectively). The YoY growth rates of both the variables return to previous levels in around a year and a half. The shock does not have an initial effect on the wage growth rate, however, 2 quarters after initial shock wage growth rate experiences a negative persistent effect (up to -0.45 p.p.). What is unexpected, is that inflation does not have a noteworthy response to this shock. The response (0.1 – 0.16 p.p.) is barely significant at 95% level. Such findings are not in line with the economic theory. Theoretically, Phillipps curve and a reduction in aggregate demand should pressure price level downwards, however, the results do not suggest that. This could, however, indicate that the countries analysed had unemployment levels higher than inflation accelerating level throughout the time period in consideration. Both consumer inflation expectations and confidence index respond similarly. An initial minor contraction (-0.92 units and -1.28 units), returning to previous levels in 3 quarters.

A one standard deviation increase in consumer inflation expectations balance statistics has some minor positive effects on real consumption growth with the initial effect of 0.42 p.p. but decreasing and diminishing in 3 quarters. However, in the longer term (5-8 quarters) the effect turns negative with similar magnitudes. This is in line with the economic theory, suggesting that consumers expecting higher inflation levels in a year's time move part of their future consumption to the present. Similar effect can be observed in changes of the real GDP growth. The shock has effect on the changes in balance statistics of consumer inflation expectations itself for about 4 quarters which is expected due to the nature of how the expectations data is collected, namely, the nature of the question to respondents having a reference level of current inflation. What is interesting, is that after 5 quarters of the response turns negative but of much lower magnitude than the shock itself. This suggests once the shock has happened, balance statistics remain on a higher level for a prolonged time, i.e. while consumers expect the inflation to decrease, they believe it will take some time before it returns to previous levels. Inflation reacts with an immediate 1.11 p.p. increase to a shock that decreases over time but is highly persistent with the effects indicated to last > 8 quarters. Supporting the previous findings on inflation shock, wages growth rate does not react to an expectations shock as well. This corroborates, that wage-price spiral was not a present shock transmission mechanism in the period analysed. Consumer confidence react negatively to the shock and the effect lasts for about two years.

A shock to consumer confidence index indicates positive effects to aggregate demand and displays responses generally expected from economic theory standpoint. The balance statistics of consumer inflation expectations initially respond with a decline (-3.87 units) but in the second quarter after the shock the effect is insignificant and onwards the effect turns positive, i.e. inflation expectations increase, peaking (2.63 p.p.) 4 quarters after initial shock. Such results might be influenced by the response of energy prices found with the model though, which is more likely to be influenced by the period as it is hard to believe energy prices would decrease after consumer confidence index hike. A one-way relationship the other way around is more likely.

Overall, the results indicate several findings. Firstly, notable discrepancies are recorded in OLS and GMM models with OLS suggesting higher degree of persistence and stronger relationships between the variables whereas GMM estimates find significantly higher standard errors leading to statistical insignificance. Impulse response functions indicate that shocks in real consumption and real GDP positively impact aggregate demand indicators aligning well with economic theory. Government spending shock results, however, suggest limited and less significant effects across multiple macroeconomic variables. Shocks to inflation expectations initially boost real consumption and inflation but eventually generate negative feedback, suggesting consumers shift their consumption forward anticipating future price increases. Wage-price spirals were notably absent as a transmission mechanism during the analysed period, highlighting weak responsiveness of wages to inflationary pressures. This indicates that public sector wage increases should not be viewed as significantly contributing to higher inflation expectations or inflation when considering fiscal policy changes. What is more, it supports Rudd's claims that the wage growth is driven more by the labour market conditions rather than worker demands in anticipating higher levels of inflation. Lastly, unemployment shocks exhibited strong negative effects on consumption and GDP growth but surprisingly limited effects on inflation, challenging traditional Phillips curve predictions, potentially indicating structural unemployment conditions above inflation-accelerating levels in the studied economies. These findings underscore the nuanced interplay between macroeconomic indicators and consumer sentiment, highlighting the need for careful model selection and interpretation when analysing macroeconomic policy implications.

4.1. Carlson-Parkin Method and Panel Vector Autoregression

The following are results when qualitative consumer inflation expectation responses are quantified using Carlson-Parkin method. Normal distribution is assumed, and three scaling parameters are used. The first scaling parameter is actual YoY inflation. While this scaling parameter is popularly used in the literature (Berk, 1999, Forsells and Kenny, 2002, Lolic and Soric, 2017, etc.), it does have its' drawbacks. The use of this scaling parameter implies that consumers correctly perceive current rate of inflation. However, studies suggest that it is not always the case. The second scaling parameter used is running average rate of inflation. It assumes that consumers approximate inflation rate from the information available but are not always up to date in their views on what the current inflation rate is. In other words, consumers possess a general awareness of past inflation developments and adjust their expectations accordingly, albeit in an imprecise and delayed manner. This parameter relaxes the strict unbiasedness assumption inherent in the Carlson-Parkin method, while still presuming that consumers broadly perceive past inflation accurately, though with a greater degree of inertia or inattention. Two years period for running average calculation is used in this study for the second scaling parameter. The third approach involves the estimation of consumers' perceived inflation by applying the Carlson-Parkin method to qualitative survey responses regarding perceptions of year-on-year inflation. This procedure necessitates the use of a scaling parameter to represent a "moderate" rate of inflation, as consumers are asked in reference to such a rate. The most commonly adopted proxies for this moderate inflation rate in the literature are either the central bank's inflation target (Lolic and Soric, 2017) or a running average of past inflation (Szyszko and Rutkowska, 2019, Lyziak, 2010, Szyszko, Rutkowska and Kliber, 2019, etc.). This approach has been the most popular in recent studies utilizing Carlson-Parkin method. What is more, recent studies (Weber et al. (2023); Huber et al. (2023)) have found strong linkage between perceived and expected inflation rates. Therefore, it may be of critical importance to consider consumer perceptions when quantifying their expectation responses. Accordingly, in this study, the third scaling parameter is defined as the quantified consumer perceived inflation rate, calculated using a two-year

running average of actual inflation. The running average of inflation acts as a moderate inflation rate, presuming that consumers base their decisions on historical information. This third approach can be considered the least restrictive in terms of how accurately consumer perceptions and expectations reflect actual inflation rates.

Figures 25–30 represent impulse response functions from PVAR models when the expected inflation used is quantified using Carlson-Parkin method. To limit the discussion of results, only response of other macroeconomic variables to inflation expectations shock and inflation expectations response to other variable shocks will be presented.

The impulse response analysis comparing models using the change in balance statistics (BS_YOY) and those using quantified consumer inflation expectations (PI_EXP1_YOY) reveals broadly similar macroeconomic dynamics across most variables. As expected, the behaviour of the inflation expectations variable itself differs notably between the two specifications, reflecting the differing measurement of the variables. Beyond this, no substantial differences in the dynamic responses of other variables are observed. Although subtle divergences can be noted. The first one can be seen in the response of the consumer confidence index (CCI_YOY) to a shock in unemployment. Although the initial response is comparable across both models, the specification using quantified inflation expectations indicates a positive long-term effect—beginning after approximately five quarters—with magnitudes reaching 0.3 to 0.4 units. Another notable difference occurs in the response of year-on-year changes in household deposits to a shock in inflation expectations. In the BS_YOY model, the response is statistically insignificant. In contrast, the PI_EXP1_YOY model produces a significant negative effect, with deviations of up to –0.7 percentage points appearing after the fourth quarter. Minor differences in the magnitude of responses are also observed in selected variables, though these do not indicate substantial changes in direction or persistence. When comparing the BS_YOY model to the model using quantified expectations constructed with a scaling parameter equal to the running average of actual year-on-year inflation (PI_EXP2_YOY), the overall dynamics again remain largely similar. However, some additional differences do arise. Specifically, the responses of energy prices (ENERGY_YOY) and consumer confidence (CCI_YOY) exhibit greater persistence in the PI_EXP2_YOY model. The relationships between energy prices, inflation, and inflation expectations are more prolonged, indicating that the inflation transmission channel through energy prices may be more strongly activated when using quantified expectations. Additionally, CCI_YOY responses to several shocks are of greater magnitude and return to pre-shock levels more slowly, suggesting that consumer sentiment dynamics may be affected by the specification of inflation expectations. This observation is further corroborated by findings from the final model, which uses perceived inflation expectations to quantify consumer views (PI_EXP3_YOY). In this specification, consumer confidence does not respond significantly to a shock in inflation expectations, diverging from the earlier models. Moreover, a positive shock to CCI_YOY results in a positive and persistent response of inflation expectations, whereas previous models exhibited an initial negative response under the same shock. This reversal implies that the sentiment channel is particularly sensitive to both the measurement and quantification specification of inflation expectations. The final model also demonstrates that although the broader dynamics remain similar, actual year-on-year inflation (PI_YOY) reacts with roughly half the intensity to a shock in inflation expectations compared to previous specifications. This finding underscores that the nature and intensity of macroeconomic adjustment processes are meaningfully influenced by the formulation of the expectations channel. Among all observed channels, consumer sentiment appears to be the most sensitive, with implications for the responsiveness of other variables. In sum, these results highlight the importance of how inflation expectations are modelled in empirical macroeconomic research. The findings suggest that the choice of expectations proxy—whether qualitative or various forms of quantified expectations—can shape the inferred strength and persistence of macroeconomic relationships, particularly through the sentiment channel. This can have important consequences for both inflation forecasting and the interpretation of expectations in research and policy.

4.2. Forecast Error Variance Decomposition

The forecast error variance decomposition analysis of our model, which utilizes business statistics as a proxy for consumer inflation expectations (as depicted in Figures 31-33), reveals several key insights into the dynamics of macroeconomic variables. The variance in real consumption, government

spending, household loans, and household deposits is predominantly explained by shocks to the respective variables themselves, with more than 85% of the variance accounted for within an eight-quarter horizon following the initial shock. In the case of real GDP growth, a significant proportion of its variance is influenced by shocks to consumption. Initially, this effect is substantial at 61.1%, although it diminishes over time to approximately 43% by the eighth quarter. Conversely, the explanatory power of real GDP growth itself increases from an initial 38.9% to about 44.8% over the same period, highlighting persistent self-influence. Additionally, the consumer confidence index becomes increasingly relevant, contributing up to 6.9% of the variance by the eighth quarter. The variance decomposition of inflation (PI_YOY) is initially dominated by its own shocks. However, as the horizon expands, consumption and consumer inflation expectations become more critical in explaining the variance, contributing 20.2% and 15.2%, respectively. Changes in the unemployment rate are largely driven by exogenous shocks to itself initially. Over time, however, shocks to consumption (14.4%) and real GDP (17.5%) increasingly influence unemployment dynamics, underscoring strong interactions between labour market conditions and overall economic activity. Consumer confidence also emerges as a significant factor, contributing 10.4% of the variance, indicating its psychological and behavioural influence on employment decisions. The consumer response balance statistics are initially heavily influenced by exogenous shocks to themselves. However, the explanatory power of real consumption growth, actual inflation, and consumer confidence grows over time, reaching 5%, 9.1%, and 9.7%, respectively, by the eighth quarter. Similarly, wages are increasingly influenced by real consumption and real GDP, with contributions of 8.4% and 4.5% at the eighth quarter. Government spending also plays a role, maintaining an explanation power of around 12% one year after the shock. As expected by economic theory, interest rate changes are primarily influenced by macroeconomic variables over longer horizons. Real consumption explains 6% of the variance, real GDP accounts for 14.4%, and inflation explains 8.2%, while consumer expectations contribute up to 5.8%. The variance in energy prices is closely tied to actual inflation levels both initially and over time, with real consumption becoming a more important factor in the longer term. Lastly, the variance in the consumer confidence index is primarily driven by its own shocks. However, consumer attitudes towards future price developments can explain up to a quarter of the variance starting from the fourth quarter. Inflation and real consumption also become more significant over longer horizons, explaining 6.4% and 4.8% of the variance, respectively. This suggests that consumer sentiment is sensitive to price levels and overall consumption patterns.

4.3. Vector Autoregression on Individual Countries

A central methodological question in the empirical literature is whether panel data analysis or country-specific estimation provides more informative insights into macroeconomic dynamics. In this study, the same model specification utilized in the panel setting is applied to individual countries in order to examine potential heterogeneity in responses. Specifically, for each country, a vector autoregression (VAR) model is estimated, and impulse response functions (IRFs) with associated 95% confidence intervals are computed. Given the focus of this research on consumer inflation expectations, the analysis centers on the principal transmission channels through which expectations, treated as an exogenous shock, affect macroeconomic outcomes. Table 1 summarizes the country-specific IRFs for the percentage change in real consumption (CONS_YOY), change in inflation (PI_YOY), wage growth (WAGES_YOY), and variation in the Consumer Confidence Index (CCI_YOY) in response to a one standard deviation shock in consumer inflation expectations response balance statistics (BS_YOY).

Table 1. Summary of VAR impulse response functions of select macroeconomic variables to a positive shock of inflation expectations (BS_YOY) for individual countries.

	Negative response	Delayed negative response	No significant response	Delayed positive response	Positive response
Real Consumption growth (CONS_YOY)	-	-	AT, BE, BG, CZ, ES, FR, GR, HR, HU, IT, LT, LU, NL, PL, PT, RO, SI, SK	-	CY, DE, EE, FI, IE, SE
Inflation (PI_YOY)	-	-	NL, SI	CZ, HU, IT	AT, BE, BG, CY, DE, EE, ES, FI, FR, GR, HR, IE, LT, LU, PL, PT, RO, SE, SK
Wage growth (WAGES_YOY)	-	ES	AT, BG, CY, CZ, DE, FI, FR, GR, HR, IE, IT, LT, LU, NL, PL, PT, RO, SE, SI, SK	BE	EE, HU
Consumer Confidence Index (CCI_YOY)	AT, BE, BG, CY, CZ, DE, ES, FR, GR, HR, HU, IT, LT, LU, PL, PT, RO, SI, SK	FI, NL, SE	IE	-	EE

The results indicate that only a minority of countries display a positive consumption response to an inflation expectations shock, with Finland being the sole country to exhibit a persistent effect beyond the initial period. In contrast, the panel model suggests a modest positive consumption effect lasting up to three quarters, yet most country-level VAR estimates do not support a statistically significant or sustained increase in consumption in response to heightened inflation expectations. Turning to inflation dynamics, the majority of country-specific responses are consistent with the aggregate panel findings. A positive expectations shock is generally associated with an increase in YoY inflation, typically following a hump-shaped trajectory of similar duration. However, some exceptions are observed, notably in the Czech Republic, Hungary, and Italy, where inflation responses are delayed, and in the Netherlands and Slovenia, where the estimated effects are statistically insignificant. Analysis of wage growth reveals that most countries do not exhibit systematic responses to changes in inflation expectations. However, in the cases of Estonia and Hungary there is a positive response in wages while in the case of Belgium there is a delayed positive effect. Conversely, Spain demonstrates a significant negative relationship, which may be attributable to structural labour market conditions, such as persistently high unemployment relative to the EU average. Nonetheless, the magnitude of these wage responses remains limited. With respect to consumer sentiment, as proxied by the Consumer Confidence Index, most countries mirror the negative response observed in the panel analysis. However, these effects are generally less persistent at the country level, with significant negative impacts persisting beyond the third period in only about half of the sample. Notably, Finland, the Netherlands, and Sweden exhibit delayed responses, while Estonia displays a short-lived positive effect. Collectively, these findings highlight substantial heterogeneity in the intensity, statistical significance, and persistence of macroeconomic responses to inflation expectation shocks across countries. This heterogeneity underscores the value of country-specific analysis for understanding the transmission of inflation expectations to macroeconomic outcomes, suggesting that aggregate panel approaches may obscure important cross-country differences.

5. Conclusions

This study presents the critical importance of accurately modelling consumer inflation expectations in macroeconomic analysis, highlighting several key points. Notable differences are found in OLS and GMM models with OLS suggesting higher degree of persistence and stronger relationships between the variables whereas GMM estimates find significantly higher standard errors leading to statistical insignificance. GMM approach might not be optimal due to the various channels that need to be considered when modelling the effects of inflation expectations and OLS approach was preferred in this case. The results indicate that there is a significant relationship between inflation expectations and consumer spending behaviour consistent with the intertemporal substitution effects asserted in theoretical models. The impulse response analyses revealed theoretically consistent, yet empirically modest effects of inflation expectations on aggregate demand and actual inflation. A critical observation was the persistent absence of the wage-price spiral during the analysed period, indicating limited transmission from inflation expectations to wage dynamics. This indicates that public sector wage increases should not be viewed as significantly contributing to higher inflation expectations or inflation when considering fiscal policy changes. What is more, it supports Rudd's claims that the wage growth is driven more by the labour market conditions rather than worker demands in anticipating higher levels of inflation. Furthermore, contrary to conventional Phillips curve expectations, unemployment shocks exhibited only marginal effects on inflation, suggesting structural labour market dynamics such as unemployment rate above the natural rate of unemployment. The results could also indicate that during the period analysed inflation was prominently influenced by supply side shocks rather than demand. Therefore, reduction of public spending as fiscal policy tool might be limited when attempting to reduce inflationary pressures. Furthermore, the sensitivity analysis utilizing different quantification methods for qualitative inflation expectation responses illustrated that macroeconomic relationships found, particularly concerning consumer sentiment and spending behaviour, are dependent on methodological choices. This study highlights that consumer sentiment dynamics display substantial sensitivity to the specific method employed for quantifying inflation expectations. Therefore, research focusing on consumer sentiment should exercise caution when selecting methods to quantify consumer inflation expectations, or alternatively, should verify the robustness of results by testing multiple quantification approaches. What is more, consumer inflation expectations dynamics and effects have considerable heterogeneity between the countries. Hence, most accurate results can be found studying the effects of consumer behaviour to macroeconomics in the context of individual countries. Future research should focus on studying individual country consumers, ideally, taking into account the heterogeneity of consumers and their behaviour patterns with regards to their beliefs about future prices, i.e. focus on different types of consumers could also benefit the research on the effects of changes in inflation expectations.

References

Arioli, R., Bates, C., Dieden, H. C., Duca, I., Friz, R., Gayer, C., Kenny, G., Meyler, A., and Pavlova, I. (2017). EU consumers' quantitative inflation perceptions and expectations: an evaluation. *Occasional Paper Series 186*, European Central Bank.

Bachmann, R., Berg, T. O., and Sims, E. R. (2015). Inflation Expectations and Readiness to Spend: Cross-Sectional Evidence. *American Economic Journal: Economic Policy* 7 (1): 1–35.

Berk, J. M. (1999). Measuring inflation expectations: a survey data approach. *Applied Economics* 31 (11): 1467–1480.

Carroll, C. D. (2003). Macroeconomic expectations of households and professional forecasters. *Quarterly Journal of Economics, 118*(1). https://doi.org/10.1162/00335530360535207

Duca, I. A., Kenny, G., and Reuter, A. (2021). Inflation Expectations, Consumption and the Lower Bound: Empirical Evidence from a Large Micro Panel. *Journal of Monetary Economics, 118*, 120-134, https://doi.org/10.1016/j.jmoneco.2020.03.005.

Foresells, M., and Kenny, G. (2002). The rationality of consumers' inflation expectations: Survey-based evidence for the Euro Area. *Working paper series No. 163*, European Central Bank.

Huber, S. J., Minina, D., and Schmidt, T. (2023). The pass-through from inflation perceptions to inflation expectations. *Discussion Papers 17/2023*, Deutsche Bundesbank.

Kucerova, Z., Paksi, D., and Konarik, V. (2024). Macroeconomic fundamentals and attention: What drives european consumers' inflation expectations?. *Economic Systems*, *48*(1), https://doi.org/10.1016/j.ecosys.2023.101153.

Lolic, I., and Soric, P. (2017). Economic uncertainty and its impact on the Croatian economy. *Public Sector Economics, 41* (4): 443–477.

Lyziak, T. (2010). Measurement of perceived and expected inflation on the basis of consumers survey data. *Irving Fisher Committee on Central Bank Statistic Working Papers, 5*. Basel: Bank for International Settlements.

Lyziak, T. (2013). Non-Positive Scaling Factor in Probability Quantification Methods: Deriving Consumer Inflation Perceptions and Expectations in the Whole Euro Area and Ireland. *Comparative Economic Studies* 55 (1): 77–98.

Millet, F. (2006). Finding the optimal method of quantifying inflation expectations on the basis of qualitative survey data. *Narodowy Bank Polski*.

Nickell, S. (1981). Biases in Dynamic Models with Fixed Effects. *Econometrica*, *49* (6):1417–1426.

Panagiotis, L., and Argyrios, A. (2023). Inflation Differentials of Euro Countries and Their Determinants. *Economies*, *11*(10), 250, https://doi.org/10.3390/economies11100250.

Pesaran, M. H., and Weale, M. (2005). Survey Expectations. CESifo Working Paper No. 1612 Handbook of Economic Forecasting.

Roberts, J. M. (1998). Inflation expectations and the transmission of monetary policy. *Finance and Economics Discussion Series*, Board of Governors of the Federal Reserve System.

Rondinelli, C., and Zizza, R. (2020). Spend today or spend tomorrow? The role of inflation expectations in consumer behaviour. *Temi di discussione (Economic working papers) 1276*, Bank of Italy, Economic Research and International Relations Area.

Rudd, J. (2021). Why Do We Think That Inflation Expectations Matter for Inflation? (And Should We?). *Finance and Economics Discussion Series 2021-062*. Washington: Board of Governors of the Federal Reserve System, https://doi.org/10.17016/FEDS.2021.062.

Rutkowska, A., and Szyszko, M. (2021). Inflation expectations quantification with fuzzy control system. *Soft Computing 25*, 7803–7812, https://doi.org/10.1007/s00500-021-05616-5.

Sigmund, M., & Ferstl, R. (2021). Panel Vector Autoregression in R with the Package Panelvar. *The Quarterly Review of Economics and Finance*, 80: 693-720, https://doi.org/10.1016/j.qref.2019.01.001.

Szyszko, M., and Rutkowska, A. (2019). Inflation Expectations of European Consumers after the Crisis. Do Macro Variables Drive Expectations?. *Eastern European Economics*, *57*(4), 271–294. https://doi.org/10.1080/00128775.2019.1610896.

Szyszko, M., Rutkowska, A., and Kliber, A. (2019). Inflation expectations after financial crisis: are consumers more forward-looking?. *Economic Research-Ekonomska Istraživanja*, *33*(1), 1052–1072. https://doi.org/10.1080/1331677X.2019.1595083.

Verbrugge, R., and Zaman, S. (2021). Whose Inflation Expectations Best Predict Inflation?. *Economic Commentary 2021-19*.

Weber, M., Gorodnichenko, Y., and Coibion, O. (2023). The Expected, Perceived, and Realized Inflation of US Households Before and During the COVID19 Pandemic. *IMF Economic Review 71*(1), 326-368.

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Managing fiscal risks in Albania: Challenges, comparative insights, and policy recommendations

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Abstract

Fiscal risk management is a key aspect of good public financial management, especially in developing countries such as Albania. This paper presents the principal sources of fiscal risks in Albania, with particular reference to state-owned enterprises (SOEs), public-private partnerships (PPPs), and contingent liabilities arising from natural disasters. Drawing on recent fiscal reports, IMF assessments, and national budgetary documents, the paper discusses the transparency, evaluation, and mitigation of fiscal risks in the Albanian context. Although considerable progress has been made in fiscal reporting and risk disclosure, crucial gaps remain in monitoring and mitigating quasi-fiscal liabilities and climate-related risks. Comparative perspectives with regional peers are included to highlight regional trends and best practices. The findings show that while Albania has made progress, major challenges remain, particularly in integrating climate and disaster risks into fiscal frameworks and in improving the governance of SOEs and PPPs. Our examination suggests that a comprehensive and transparent fiscal risk management framework is needed to support Albania's fiscal sustainability and resilience to potential shocks. The paper concludes with practical recommendations directed to policymakers and fiscal authorities for the construction of a more robust and forward-looking fiscal risk framework. This article addresses the question: "How resilient is Albania's fiscal framework to key economic and structural risks?", using mixed-methods combining scenario analysis, comparative benchmarking, and policy evaluation. Results highlight Albania's progress in fiscal transparency but point to gaps in SOE governance, PPP oversight, and disaster risk financing. This article is among the first to examine Albania's fiscal risks systematically by combining scenario analysis, cross-country benchmarking, and stress testing. By placing Albania's experience in regional and international contexts, the study contributes new empirical evidence on fiscal risk management in emerging economies.

Keywords: Fiscal Risks, Fiscal Risk Statement (FRS), Public Financial Management (PFM) Strategy, Albania, Western Balkans.
Jel Codes: H63, H12

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1. Introduction

Fiscal risk management has become a key priority for governments globally, especially following successive global crises in the last two decades. Fiscal risks, which are deviations from baseline fiscal projections caused by unforeseen shocks, have been heightened globally by macroeconomic volatility, geopolitical instability, climate change, and public finance structural weaknesses. These risks, which the International Monetary Fund (IMF) has identified, include macroeconomic shocks, contingent liabilities, natural disasters, and financial sector vulnerabilities. The COVID-19 pandemic, for instance, has highlighted how health crises can easily spill over into fiscal domains, creating massive, unexpected deficits and debt accumulation among the developed and developing economies. Similarly, higher energy prices globally, supply chain dislocations, and the economic fallout of the Ukraine-Russia war have generated pervasive risk pressures on the fiscal front, forcing governments to reconsider their risk management frameworks. The Western Balkans region in which Albania is located has its own fiscal risks shaped by regional and global forces. The region has conventionally been vulnerable to macroeconomic shocks due to its small open economies, massive public debt, relatively underdeveloped financial markets, and extensive foreign financing dependency. These nations, which also include Serbia, North Macedonia, Montenegro, and Albania, have all experienced the fiscal pressures brought about by the global crises combined with domestic structural problems such as inefficient management of state-owned enterprises (SOEs), ill-regulated public-private partnerships (PPPs), and limited disaster risk financing instruments. Regional nations are also highly exposed to natural disaster risks such as earthquakes, floods, and landslides, which are material contingent fiscal risks (World Bank, 2021). The fiscal risk profile of Albania has been impacted firsthand by five years of built-up shocks and underlying structural issues. The 2019 earthquake incurred damages that totaled approximately €1 billion or 6.4% of GDP, thus placing immense pressures upon the government budget to recover. This was followed by the COVID-19 pandemic that reduced economic activity and forced the government to implement large-scale fiscal support policies, driving the public debt to a record high of 74.5% of GDP in 2020. Subsequently, the 2021 onset of the global energy crisis and the economic spillovers of the Ukraine-Russia war imposed the additional pressures, particularly on Albania's energy SOEs that were forced to absorb the shock of higher electricity prices. Despite progressive budget consolidation that lowered public debt to less than 58% of GDP by 2024, Albania remains vulnerable to a range of sources of fiscal risk. These are macroeconomic shocks, underperformance of SOEs, contingent liabilities from PPPs, and natural disasters.

Against this background, the need for good fiscal risk management can no longer be ignored. Effective management of fiscal risks is crucial to guarantee debt sustainability, maintain fiscal discipline, provide macroeconomic stability, and enhance investor and public confidence. Countries with strong fiscal risk frameworks are better placed to absorb external shocks, avoid procyclical fiscal tightening in times of crisis, and maintain access to domestic and international capital markets (IMF, 2016). For such developing economies as Albania, whose institutional capacity remains in the making and whose fiscal space is very limited, fiscal risk management is not merely a question of technique—it is an imperative of strategy. One of the most important recent actions of Albania in its fiscal management efforts has been disclosing the first Fiscal Risk Statement (FRS) in 2023. While FRS 2023 is not yet officially published, it is prepared annually, and much of its content is included in the government's annual budget reports. According to Ministry of Finance (2023), FRS brings macro-fiscal risk analysis, reviews of SOEs, exposures of PPPs, and disaster risks together in a single reporting framework, constituting a major move towards higher fiscal transparency. The introduction of such an instrument reflects best international practice and is consistent with IMF and World Bank recommendations.

This research relies on Albania's Fiscal Risk Reports and other global sources to provide an extensive examination of the fiscal risk condition in the country. Overall research questions driving this research are:

1. What are the main sources of fiscal risk in Albania?
2. How efficient are current structures for dealing with fiscal risk?
3. What policy reforms need to be introduced to increase Albania's fiscal resilience?

The organization of the paper is as follows: Section 2 provides an overview of the regional and international literature on fiscal risks. Section 3 presents the data and methodology used in analysis. Section 4 provides a close examination of Albania's fiscal risks and comparative lessons from other Western Balkan countries. Section 5 discusses challenges and opportunities and interprets the results. Section 6 offers concrete policy recommendations, and Section 7 summarizes the key conclusions and recommendations for future research.

This research is among the first to comprehensively evaluate Albania's fiscal risks and bring it in line with international fiscal risk governance standards. By situating Albania's practice within the Western Balkan and international contexts, the paper contributes new empirical evidence to fiscal risk literature for emerging economies.

Despite a growing body of literature on fiscal risks, limited empirical research has been conducted focusing on Albania. Most analyses are either regional or diagnostic in nature. This paper fills that gap by providing a structured, country-level assessment aligned with international fiscal risk governance frameworks.

2. Literature Review

Fiscal risks are typically categorized into macroeconomic risks (GDP shocks, inflation, exchange rates), structural risks (SOEs, PPPs), and contingent liabilities (lawsuits, guarantees). Fiscal risks are typically underreported or underestimated, which leads to surprise fiscal stress. (Cebotari, 2008). IMF (2016) asserts that the four pillars of fiscal risk management are identification, assessment, mitigation, and disclosure. SOE risks have been widely studied. SOEs are likely to create quasi-fiscal deficits that expose public accounts to risk (Baldacci et al., 2011). In Serbia, selective privatization and governance reforms reduced SOE risks (IMF, 2023). In North Macedonia, the creation of a centralized PPP unit strengthened risk management (World Bank, 2021). Disaster risk financing incorporates multi-layered approaches, blending budgetary reserves, contingent credit, and insurance (Clarke and Mahul, 2011). Climate risk must be mainstreamed into fiscal frameworks, particularly in countries at risk of disaster like Albania (GFDRR, 2014). Fiscal vulnerabilities of Albania are shared with other small economies, according to World Bank (2021), which stress the necessity of greater transparency, better oversight of SOEs, and more advanced risk-financing instruments. While the typology is conceptually clear, its operational use in fiscal policy planning remains inconsistent across developing countries.

The concept of fiscal risk has been center stage in the world economic discourse, particularly since the global financial crisis in 2008. Fiscal risks as deviations in fiscal performance from the levels expected in the future, arising from events that are not directly within the control of policymakers (OECD, 2015). These may range from macroeconomic shocks such as below-trend growth or commodity price shocks to the triggering of contingent liabilities, such as guarantees on lending or public-private partnerships. IMF (2016) emphasizes that fiscal risks not only impose budgetary pressures but also undermine fiscal sustainability, macroeconomic stability, and the credibility of fiscal policy institutions. The literature on fiscal risk management has expanded a lot over the past twenty years. Allen, Hemming, and Potter (2013) present an international framework for public financial management. They stress the importance of having tools to identify and reduce risks in developing economies. Cottarelli (2011) connects fiscal risks to debt sustainability, claiming that unmanaged contingent liabilities can quickly turn into real costs during crises. However, few studies examine this in small transition economies. Eyraud and Wu (2015) argue that the effectiveness of fiscal rules mostly relies on how well they fit into institutional frameworks and enforcement methods. Despite this, the use of such rules in the Western Balkans is still limited. This paper builds on these key contributions by applying them to the Albanian context and examining their relevance, especially concerning SOEs, PPPs, and liabilities related to disasters.

The IMF and the World Bank have developed comprehensive guidelines and diagnostic tools for nations to identify and address fiscal risks. The IMF's Fiscal Transparency Code and its associated Fiscal Transparency Evaluations (FTEs) offer a consistent framework for assessing fiscal risk disclosure practices. Countries that conduct regular fiscal risk assessments and issue fiscal risk statements tend to benefit from lower borrowing costs and higher fiscal credibility (MF, 2019). The World Bank also developed tools like the Public Expenditure and Financial Accountability (PEFA) framework, which assesses fiscal risk management practices, particularly those relating to SOEs, PPPs, and subnational

governments. While the IMF (2016) offers a robust framework for fiscal risk analysis, its practical implementation in countries like Albania remains underexplored. Furthermore, few studies (e.g., World Bank, 2021) assess the operational outcomes of risk mitigation policies. This paper builds on such frameworks but critically evaluates their adaptation in the Albanian context, considering institutional capacity and local governance dynamics.

Research on SOEs as fiscal risk factors has identified their potential to generate implicit liabilities and exact high budgetary costs. Baldacci et al. (2011) argue that quasi-fiscal deficits, unrecorded fiscal obligations by SOEs that are not shown in the budget, are bound to undermine fiscal discipline and substitute for priority expenditures. This is a key problem in sectors such as energy, water, and transport, where SOEs usually experience soft budget constraints. Serbia's progress in containing SOE-related risks via governance reformation and partial privatization, which have improved operating efficiency and mitigated fiscal exposure has been confirmed by IMF (2023). Similarly, World Bank (2021) finds that North Macedonia has strengthened its PPP setup by establishing a centralized monitoring office and enhancing project appraisal capacity.

Natural disaster risk and climate change are becoming more and more regarded as an essential part of fiscal risk management. Disaster risk financing requires a multi-layered framework that integrates budgetary buffers for minor and frequent disasters, contingent credit lines for shocks of medium scale, and market-based instruments such as catastrophe bonds for frequent but intense disasters (Clarke and Mahul, 2011). The Global Facility for Disaster Reduction and Recovery (GFDRR) (2014) argues that integrating disaster and climate risk into fiscal frameworks is essential for high-exposure nations such as Albania, the Philippines, and Caribbean island states. Without proactive risk management, governments can resort to costly ex-post financing, e.g., budget reallocations, tax increases, or foreign borrowing, which can undermine fiscal sustainability.

The Western Balkan experience provides optimistic comparative lessons for Albania. Serbia has taken the lead in SOE reform, avoiding fiscal risks through restructuring and part-privatization. The steps have successfully resolved operational inefficiencies and fiscal transfers, reports IMF (2023). Centralized PPP oversight has been used in North Macedonia, improving the project appraisal function and reducing contingent liabilities (World Bank, 2021). Montenegro, though, has struggled with higher public debt and macroeconomic risk, as well as a constrained economic foundation and tourism dependence. Regional reviews by the European Commission and World Bank emphasize institutional reforms, in SOE governance, PPP procurement, and disaster risk financing, to ensure fiscal resilience.

Despite this growing amount of global and regional literature, however, there is also a major gap in country studies focusing on Albania. Albania has been included in cross-country analysis and in regional diagnostics but comparatively few studies characterize its unique fiscal risk profile in detail. This is important, as Albania is subject to natural disasters, it has a large portfolio of SOEs, and it has growing use of PPPs for financing the construction of infrastructure. The recent completion of Albania's Fiscal Risk Statement (FRS) is an important step forward in increased fiscal risk transparency but has so far not been the subject of broad-based academic or policy-oriented research. The FRS consolidates macro-fiscal risks analysis, SOE performance, PPP liabilities, and disaster risks into a single reporting framework, and it is an excellent basis for future research (Ministry of Finance, 2023).

Briefly, global literature stresses that there is a requirement for solid fiscal risk management frameworks that consolidate transparency, institutional reforms, and technical tools. Although cross-country analysis offers instructive lessons, there is clearly a need for more in-depth, country-by-country analysis of Albania's fiscal risk environment. This paper has the objective to fill this void by offering a general assessment of Albania's fiscal risks, making use of the FRS and best international practice, and recommending country-specific policy recommendations to strengthen fiscal resilience. n sum, while existing literature outlines the architecture of fiscal risk management, this study contributes a country-specific application with empirical depth, focusing on Albania’s evolving risk profile.

3. Data & Methodology

This study is grounded on a mixed-methods approach, combining quantitative analysis of data with qualitative assessments. The primary sources of data include the annual budget reports of the government submitted by the Ministry of Finance of Albania; the World Bank's Albania Country Economic Memorandum (2021); the Draft Disaster Risk Fiscal Assessment (2025); and the IMF Article IV Consultation Reports (2023–2024). Quantitative analysis includes fiscal indicators like GDP growth, debt-to-GDP proportions, fiscal deficit, SOE arrears, and PPP obligations. Qualitative analysis comprises comparison of Albania's fiscal risk management regimes with regional comparators, namely Serbia, North Macedonia, and Montenegro. Stress-testing methods are used in assessing sensitivity of fiscal indicators to macroeconomic shocks, SOE performance, PPP obligations, and disaster risk.

Source	Type of Data	Used For
Ministry of Finance of Albania (2023–2024)	FR Reports, SOE arrears, PPP exposures, macro indicators	Trend analysis, baseline scenarios
World Bank (2021, 2025)	Country diagnostics, fiscal risk benchmarking, PPP management	Regional comparison, good practices
IMF Article IV Reports (2023–2024)	Macroeconomic forecasts, fiscal balance, SOE governance	Stress testing, macro-fiscal modeling
Draft Disaster Risk Fiscal Assessment (2025)	Natural disaster risk and fiscal impact estimates	Contingent liability simulation
National Budget Documents (2020–2024)	Debt, deficit, revenues, projections	Baseline fiscal indicators, verification

Table 1. Summary of Key Data Sources, Variables, and Uses

Source: Author’s compilation

The quantitative portion of the analysis uses historical and recent data on key fiscal aggregates. Public debt, GDP growth, fiscal deficit, and SOE arrears were sourced from the Ministry of Finance annual budget documents. Public finance reports, IMF staff papers, and World Bank diagnostics provided data on PPP exposures and contingent liabilities. For comparison within the region, the report uses IMF and World Bank statistics for Serbia, North Macedonia, and Montenegro over the past five years. These statistics allow us to compare Albania's fiscal performance and risk exposure to that of similarly macroeconomic and institutional characteristics of countries.

Trend analysis deals with movement in the key fiscal variables over time, particularly before and after major shocks such as the 2019 earthquake, the COVID-19 pandemic, and the 2021–2022 energy crisis globally. Ministry of Finance (2023) shows that public debt sharply rose after the COVID-19 crisis, to 74.5% of GDP in 2020, but fell to below 58% in 2024. This resulted from fiscal consolidation. SOE arrears have fallen by 15% since 2023, reflecting improved liquidity management, and PPP liabilities have remained below the statutorily imposed 5% of last-year tax collections. Trends are benchmarked against regional comparators to capture structural trends and gaps.

The relative regional comparison examines Albania's fiscal risk profile in relation to its Western Balkan peers. Serbia has progressed significantly in reform of SOE and limited privatization, and in reducing fiscal exposures (IMF, 2023). North Macedonia has established a centralized PPP supervision unit, enhancing risk management in infrastructure projects. Montenegro, however, remains beset by excessive debt and constricted fiscal space, and reflects the dilemma of small tourist economies. Comparing Albania's indicators and institutional framework to these peers, the analysis points out what are the strength points and which areas need development.

A main element of methodology includes scenario analysis and stress testing. Stress testing is employed for the estimation of possible effects on Albania's public finances from macroeconomic, financial, and catastrophe-related shocks. For example, using historical fiscal elasticities and multipliers, the study estimates the effects of a 2% GDP shock on the fiscal deficit, debt-to-GDP ratio, and primary balance. Such a shock would increase the debt-to-GDP ratio by around 4 percentage points and widen the fiscal deficit by 1–1.5% of GDP, as reported by Ministry of Finance (2023). Similarly, the analysis considers SOE performance shocks—such as liquidity shortages or revenue underperformance—and their probable budgetary implications. PPP risks are estimated using contingent liability models following World Bank (2016) guidelines. Finally, the analysis incorporates Draft Disaster Risk Fiscal Assessment (2025) estimates to estimate the average annual fiscal losses of natural disasters, which are estimated at around $130 million per year in Albania. While the analysis does not rely on an econometric simulation model, it applies internationally recognized scenario-based methods using parameter estimates reported by the IMF and Ministry of Finance.

3.1. Limitations and Assumptions

This study assumes fiscal elasticities and shock responses based on IMF benchmark estimates for emerging markets. These assumptions help make comparisons across countries, but they may not fully reflect Albania's unique fiscal dynamics or institutional traits. While the approach converges the richest information available on fiscal risk, it has some limitations. First, using government sources underestimates and may exclude specific risks associated with contingent obligations, municipal bodies, and litigation case risks. By way of example, discretionary allocations to and guarantees under some PPP contracts for each dollar have things buried hidden, reducing fiscal exposure determinations. Secondly, the timeliness and quality of SOE data vary markedly across sectors, with energy and water SOEs possessing more robust reporting frameworks compared to transportation or postal services. Thirdly, regional comparison is made using internationally available public data that may not fully capture country-specific institutional particulars or recent reform efforts. Finally, stress testing can be useful in delivering indicative estimates, but it relies on past relationships that may not hold in unprecedented or extreme shocks.

Despite these limitations, the mixed-methods approach used in the study allows for a balanced and multi-faceted assessment of Albania's fiscal risks. Through the intersection of quantitative trend analysis, regional benchmarking, and scenario-based stress tests, the paper aims to provide policymakers and researchers with insightful information regarding Albania's fiscal risks and potential policy responses.

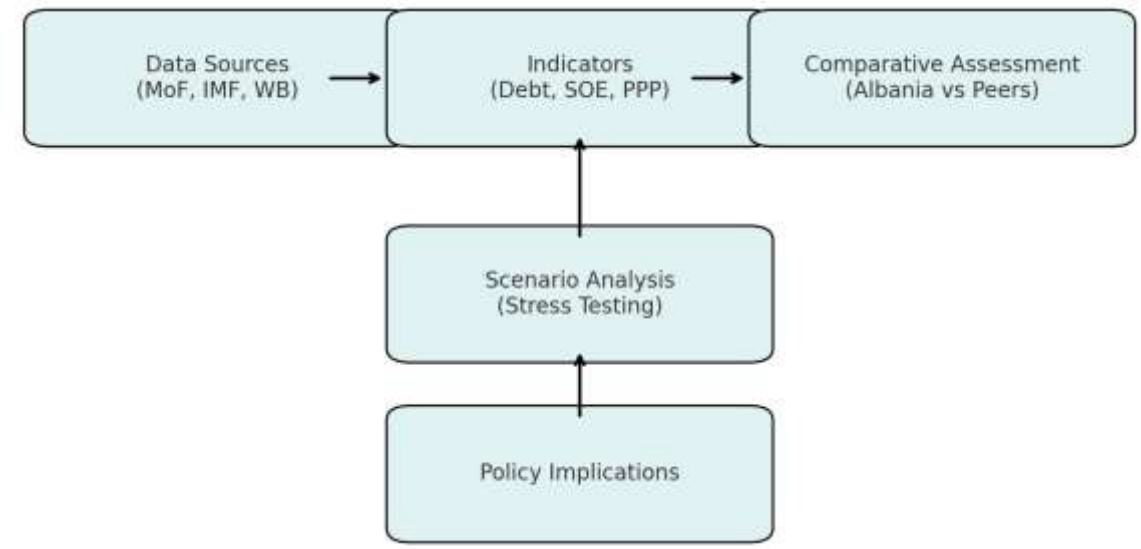


Figure 1. Methodological Flow: From Data Sources to Policy Implications

Source: Author’s elaboration based on institutional and international datasets.

4. Results

Macroeconomic Risks: Albania grew at an estimated level of 3.6% in 2024, with projections of around 3.8% growth in 2025. Inflation eased to around 3.9% in 2024, helped by monetary tightening and improved global supply chains. Public debt, which peaked at 74.5% of GDP in 2020, has declined steadily to around 58% as of 2024, in accordance with persistent fiscal consolidation. Nevertheless, the economy remains vulnerable to external shocks like commodity price volatility and regional tensions. The Ministry of Finance (2024) approximates that a 1% GDP shock would increase the fiscal deficit by 0.5–0.7% of GDP and the debt-to-GDP ratio by approximately 2–3 percentage points.

State-owned enterprises (SOEs) have experienced some improvement on the financial side but remain plagued by major challenges. SOE arrears decreased by about 17% in 2024, with notable improvements in the energy sector, particularly by OSHEE and KESH. Water utilities, however, are still not financially viable, depending on municipal subsidies and accumulating arrears. While energy SOEs' liquidity has

improved, structural problems persist, including deteriorating infrastructure, governance problems, and political interference (Ministry of Finance, 2024).

Public-private partnerships (PPPs) are becoming an ever-increasing tool for Albania's infrastructure development. The payments have been below the statutory threshold of 5% of previous-year tax collections for the state, but concerns regarding project appraisal, risk allocation, and reporting standards continue. North Macedonia's experience with having a central unit for PPPs has strengthened risk assessment and transparency and represents a good model to follow by Albania, as evaluated by the World Bank (2021). Albania at present lacks an institution that focuses on PPPs, raising the likelihood of budgetary slippages, cost overruns, and hidden liabilities.

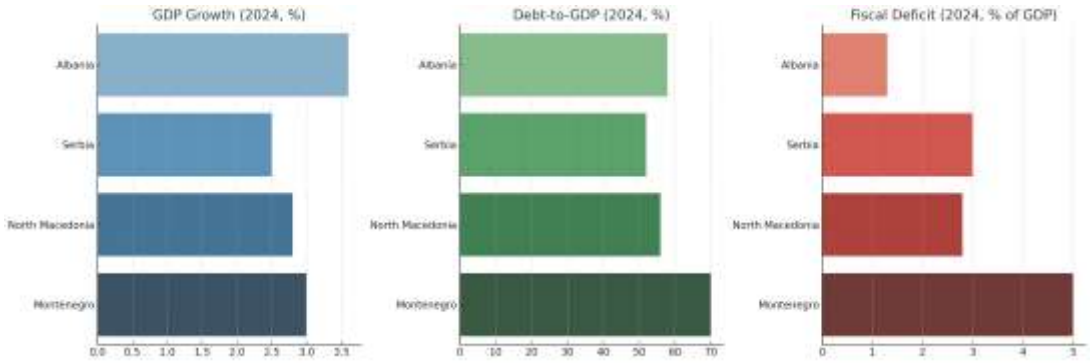
Natural hazard risk is the major fiscal threat to Albania, one of Europe's most hazard-prone nations. The earthquake in 2019 caused losses equivalent to ~6.4% of GDP and provides the fiscal benchmark. According to the Draft Disaster Risk Fiscal Assessment (2025), the average annual loss in Albania as a result of natural disasters now amounts to some $140 million, which considers new risk assumptions including the influence of climate change, such as rising floods, landslides, and coastal erosion. Areas exposed to the risk include Shkodra, Lezha, and Vlora. Although the government now has a national plan for managing disaster risks at the national level, pre-established financing instruments such as contingency funds and insurance products remain scarce, and Albania depends on ad hoc re-allocations and donor assistance in the aftermath of high-magnitude disasters.

Contingent liabilities from legal litigation, court judgments, and international arbitration cases are uncertain fiscal charges. Various high-profile cases involving PPP contracts, expropriation, and investor-state arbitrations have attracted significant budget payments in recent years. Strengthening legal risk management skill in the Ministry of Finance, improving contract drafting, and undertaking fiscal provisioning are critical steps in reducing such liabilities.

Albania is compared to its regional peers, Serbia, North Macedonia, and Montenegro, in an informative manner. Serbia has made substantial improvement in SOE reform through partial privatization, the implementation of performance-based management contracts, and corporate governance improvement, which has reduced fiscal transfers and arrears (IMF, 2023). North Macedonia has improved its PPP framework through centralized administration and greater project appraisal capacity (World Bank, 2021). Montenegro, however, continues to grapple with high public debt, tight fiscal space, and a narrow economic base reliant on tourism, making it highly vulnerable to external shocks and natural disasters.

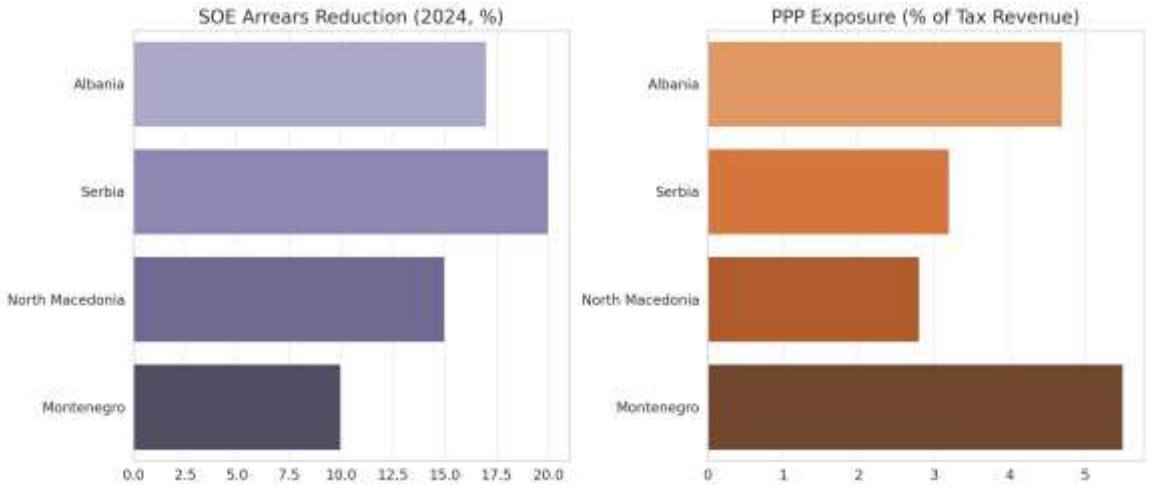
Based on key indicators, Albania's public debt-to-GDP ratio of ~58% is superior to Montenegro's ~70%, but remains above Serbia's ~52% and North Macedonia's ~56%. Fiscal imbalances have been better contained in Albania at ~1.3% of GDP, compared with Serbia (~3.0%), North Macedonia (~2.8%), and Montenegro (~5.0%). Arrears clearance in SOEs in Albania (17% in 2024) compares with regional peers as a whole, but the reform tempo in sectors other than energy, particularly water utilities, lags. PPP exposures are still under control, but the governance frameworks of Albania lag behind best-practice models seen in North Macedonia.

Tables and charts integrated into this analysis highlight these comparative patterns:



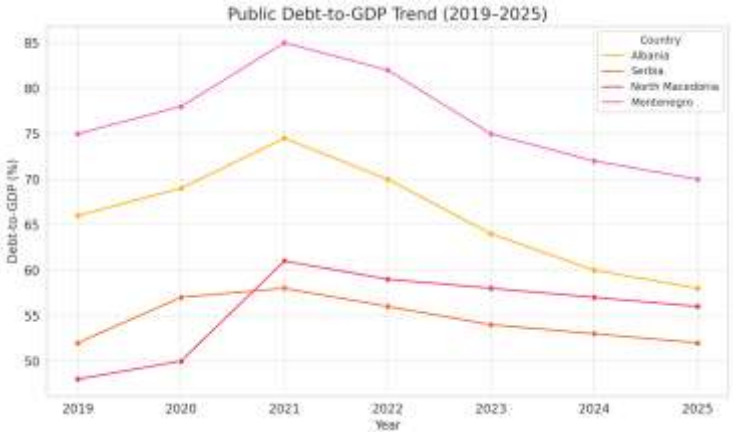
Graph 1. GDP growth, debt-to-GDP, and fiscal deficit (Albania and peers)

Source: Ministry of Finance (2024); IMF Article IV Reports (2023–2024); World Bank (2021–2024)



Graph 2. SOE arrears reduction and PPP exposure

Source: Ministry of Finance (2024); IMF (2023–2024); World Bank (2021–2024)



Graph 3. Public Debt to GDP Trend (2029-2025)

Source: Ministry of Finance (2024); IMF Article IV Reports (2021–2024); World Bank Macro Outlook (2023–2024)

These graphical indicators underscore Albania's achievement in lowering the public debt and SOE arrears management, along with underlining the vulnerabilities that currently exist relating to disaster risk and contingent liabilities.

In conclusion, Albania has achieved notable progress toward managing macroeconomic and SOE-related fiscal risk, but it still faces difficulties in managing PPPs, disaster risk finance, and addressing contingent liabilities. Regional peer lessons highlight that sustainable reforms are essential, supported by reinforced institutions and the adoption of global best practices. To increase fiscal resilience, Albania must further SOE restructuring, enhance PPP governance, and develop pre-agreed fiscal risk finance instruments.

5. Discussion

The findings of this paper represent a novel contribution to the understanding of fiscal risks in transition economies. By examining multiple dimensions—macroeconomic shocks, SOEs, PPPs, and climate-related risks—the study delivers a comprehensive and policy-relevant diagnosis for Albania, which can inform both domestic reforms and international technical assistance.

Albania made important progress: the FRS, SOE monitoring, PPP oversight, and a national disaster response strategy. Nevertheless, there are challenges: weak SOE governance; limited restructuring

plans; PPP contracts lacking independent feasibility studies; no dedicated disaster reserve fund or catastrophe insurance; and limited fiscal buffers. Regional best practices are Serbia's SOE restructuring, North Macedonia's PPP oversight, and Montenegro's diversification needs. Synchronizing institutional reforms with advanced risk instruments is crucial for long-term resilience as reported by IMF (2023).

The result of this analysis shows that Albania has made considerable progress in enhancing fiscal risk management, namely through macroeconomic consolidation and increased transparency. The creation of the Fiscal Risk Statement (FRS) is a milestone reform that has enhanced the government's ability to detect, monitor, and disclose fiscal risks. The downward adjustment of the public debt level from 74.5% of GDP in 2020 to about 58% by 2024 is an indicator of a successful fiscal consolidation journey, aided by sustained economic growth and cautious fiscal management. Sustained gains in SOE performance, highlighted by the reduction of arrears in the energy sector by 17%, also point toward improvement in mitigation of structural risks. The maintenance of PPP payments within the statutory ceiling of 5% of last-year tax revenues is also an indication of Albania's fiscal discipline.

Despite all these achievements, several weaknesses still persist. Management of SOEs remains weak, and restructuring has had little success outside the energy sector. Water utilities, municipal-owned enterprises, and transport SOEs remain on soft budget constraints, which continue to lead to chronic deficits and arrears. The lack of independent feasibility studies in PPP contracts threatens value for money, risk management, and fiscal exposure. Disaster risk financing is underdeveloped, with no reserve fund or catastrophe insurance mechanisms in place, exposing Albania to post-disaster fiscal shocks. Fiscal buffers are thin, constraining the government's capacity to absorb external and domestic shocks without borrowing or budget relocations.

Compared to regional peers, Albania has a mixed performance. On the positive side, Albania's fiscal deficit (~1.3% of GDP) is smaller than Serbia's (~3.0%), North Macedonia's (~2.8%), and Montenegro's (~5.0%). Debt-to-GDP ratios have been reduced more forcefully than in Montenegro but remain above Serbia and North Macedonia. SOE arrears reduction in Albania (17% in 2024) aligns broadly with regional trends but has been sectoral unbalanced. Serbia advanced SOE management through part privatization and performance contracts, with Albania trailing. North Macedonia's centralized PPP department provides a model of best practice for project appraisal, monitoring, and risk management—a function which Albania lags behind on. Montenegro's case points to the importance of diversification because Albania's openness to remittances, tourism, and energy exports exposes it to concentrated sectoral risks.

Institutionally and politically, Albania also faces several issues that hinder the full operationalization of fiscal risk management reforms. Institutional capacity within the Ministry of Finance has also been strengthened in macro-fiscal analysis and reporting but is weakened in specialized roles such as SOE monitoring, PPP risk assessment, and legal risk management. Coordination between government institutions, including line ministries, municipal governments, and regulatory institutions, is typically weak, leading to weak risk management initiatives. The political economy dimension is important too: SOE reform, especially in the power and water industries, is politically unpalatable due to apprehension regarding social impact, employment, and tariffs. Similarly, better PPP governance requires political will to apply transparency, accountability, and competitive procurement practices.

One of the most important strengths of Albania's fiscal risk management system is its growing promotion of transparency. Publication of fiscal data, budget implementation reports, and medium-term fiscal perspectives has grown in the past five years. The FRS, while not yet published in full, has provided a basis for the institutionalization of fiscal risk reporting, putting Albania in alignment with best global practice. Transparency is not merely vital for strengthening domestic accountability but is also critical to maintaining investor confidence, increasing credit ratings, and achieving access to international capital markets.

But all this is necessary without adequate risk mitigation measures. For the SOEs, this means more than monitoring to concrete restructuring measures, including cost recovery, tariff reforms, governance improvement, and where appropriate, privatization or public-private partnerships. For PPPs, the legal and institutional framework needs to be tightened in order to ensure that projects are subjected to rigorous appraisal, competitive tendering, and regular performance monitoring. For risk of disasters,

developing a multi-layered financing plan—blending budgetary buffers, contingent credit lines, and market instruments such as catastrophe bonds—would improve Albania's capacity for shock absorption.

Regional examples are helpful. Serbia's reform of its SOEs shows that clearly spelled-out performance objectives, independent auditing, and governance changes can keep fiscal risks in check and improve the delivery of services. North Macedonia's centralized PPP unit focuses on the necessity of strong institutions to provide value for money and risk management. Montenegro's exposures underscore the necessity to preserve fiscal buffers and attain economic diversification. Albania's key takeaway is that technical reforms must be supported by political commitment and cross-government coordination to make actual progress.

Generally, Albania has progressed significantly in the identification and oversight of fiscal risks as well as mitigation and building resilience gaps but still faces significant gaps in institution-building capacity, policy reform, and political will. Without them, Albania is susceptible to a range of fiscal risks to macroeconomic stability, debt sustainability, and long-term development prospects.

The findings hold fiscal authorities, investors, and partners for development policy relevance. Better fiscal disclosure and institutionalized SOE and PPP management are able to reduce risk premia, improve Albania's credit profile, and underpin long-run macroeconomic stability.

6. Policy Recommendations

As Albania's fiscal risks analysis indicates, there is no doubt that the country has achieved tremendous progress, but some areas are in need of further reform to enhance fiscal resilience. Achieving these priorities will not only make public finances more sustainable but also increase Albania's shock resilience, improve investment, and align its policies with international best practices.

1. SOE Governance:

Albania needs to move away from monitoring and reporting and go for concrete SOE reforms. Restructuring strategies in the poorly performing firms must be introduced, especially in the energy, water, and transport sectors. Implementation of performance-based management contracts tied to quantifiable operation goals is effective in enhancing efficiency and accountability. Independent external auditing must be made mandatory for improving transparency, identifying operating inefficiencies, and building investors' and citizens' confidence. Where appropriate, public-private partnerships (PPPs) or partial privatization would bring in capital, technology, and management expertise, particularly into non-core areas. Proper municipal utility governance is also essential because they bear a massive share of local fiscal risk.

2. PPP Management with International Standards

For more effective management of PPPs, Albania must establish a centralized unit for monitoring and overseeing PPPs similar to that in North Macedonia. This unit must undertake project appraisal, contract negotiation, risk analysis, and post-contract monitoring. Compulsory independent cost-benefit analysis and feasibility tests for all significant PPP projects will guarantee value for money and optimum risk allocation. Also, the government can make standardized PPP contracts along international guidelines (such as those of World Bank and OECD) to improve transparency, lower the risks of renegotiation, and lower fiscal exposure. Transparent, competitive tendering procedures and timely release of contract details are also important for improving governance and trust in government.

3. Budgeting for Climate and Disaster Risks:

Because Albania is very vulnerable to earthquakes, floods, and climate change, mainstreaming climate and disaster risks in the national budget process is imperative. This means establishing a specific national disaster reserve fund to pay for emergency response and recovery. Albania should also look into the use of catastrophe bonds, parametric insurance, and contingent credit lines as a way of diversifying the disaster risk financing instrument. Mainstreaming the analysis of climate risk into planning public investment, particularly in the infrastructure sector, will ensure assurances for long-term resilience. Support to strengthening early warning systems, investment in adaptation measures to climate, and integrating climate considerations into medium-term fiscal plans are also recommended.

4. Fiscal Transparency and Reporting:

Enlarging the Fiscal Risk Statement (FRS) to cover a wider list of risks—such as municipal contingent liabilities, climate risk, and legal contingencies—will significantly increase fiscal transparency. The FRS should be published periodically as a standalone report or part of the budget package every year. Strengthening the law framework to enable timely, comprehensive, and accessible fiscal risk reporting will improve domestic accountability and Albania's international image with partners and credit rating agencies. In addition, improving public financial management systems to increase the coverage, consistency, and quality of fiscal information will allow policymakers to make better-informed decisions.

5. Macro-Fiscal Resilience:

Fiscal buffers should be strengthened in order for Albania to withstand future shocks without sacrificing macroeconomic stability. This would mean maintaining primary fiscal surpluses during economic growth, employing prudent macroeconomic assumptions in budgeting, and strengthening medium-term fiscal frameworks. Implementing a formal fiscal rule, such as a debt or spending ceiling, would anchor fiscal discipline and reduce procyclicality. Improving the efficiency of public spending, for example, through performance budgeting and expenditure reviews, will create room for priority spending without increasing fiscal risks.

7. Conclusion

Albania has made considerable progress in regards to fiscal risk management, such as the development of the Fiscal Risk Statement (FRS) and the Public Financial Management (PFM) Strategy. The aforementioned reforms have strengthened the government's capacity for identifying, monitoring, and reporting fiscal risks, increasing transparency, and bringing Albania to best international standards. Albania has achieved noteworthy improvements in reducing public debt, improving SOE liquidity, and maintaining PPP exposures within the legislation. Concurrently, macroeconomic stability has been supported by stable GDP growth and declining inflation levels.

Despite this breakthrough, there remain major institutional and technical gaps. Governance reforms in SOEs have been uneven, with the power sector leading the way but municipal utilities and transport companies lagging behind. PPP oversight remains weak, including the lack of independent feasibility studies and central monitoring. Albania's exposure to natural disaster and climate risk remains high, and the absence of special disaster financing instruments renders the country vulnerable to post-shock fiscal distress. Strengthening SOE and PPP oversight, integrating climate and disaster risks into the budget process, and improving the coverage and quality of fiscal disclosure are thus critical next steps.

For policymakers, these findings reaffirm the imperative of moving beyond disclosure and identification toward anticipatory avoidance of risk. Adoption of a multi-layer disaster risk financing system, strengthening contingent liability legal underpinnings, and a bolstering institutional capacity of the Ministry of Finance are essential in building fiscal resilience. Reforms must also focus on improving coordination among government agencies, depoliticization of SOE management, and ensuring PPP projects are value for money. Importantly, building fiscal buffers during periods of economic growth can buffer the requirement for procyclical adjustment during periods of crisis.

The Albanian experience provides valuable lessons to emerging economies facing fiscal vulnerabilities in the face of increasing shocks. Albania's experience highlights the need to combine fiscal discipline with institutional reform, technical innovation, and political will. For countries facing similar risks, adopting fiscal risk statements, developing disaster financing frameworks, and improving SOE and PPP governance can improve fiscal sustainability and assist in protecting macroeconomic stability.

Later research should focus on more in-depth examinations of Albania's fiscal risks, including municipal debt, pressures in the pension system, and climate adaptation expenses to the fiscal balance. Additional empirical research, namely through scenario modeling and stress tests, can determine the fiscal implications of varied shocks and better inform policy responses accordingly. Cross-country analysis can also provide valuable benchmarking of Albania's progress as well as indicate best practices transferable to the country environment.

Furthermore, future researchers could explore subnational fiscal risks, conduct econometric simulations of climate-induced fiscal stress, or use machine learning to identify early-warning signals in SOE data. Longitudinal studies tracking FRS implementation over time would enrich the empirical understanding of reform effectiveness.

References

Allen, R., Hemming, R., & Potter, B. H. 2013. *The International Handbook of Public Financial Management*. Palgrave Macmillan.

Baldacci, E., Gupta, S., & Mulas-Granados, C., 2011. Assessing Fiscal Risks. *IMF Working Paper*, No. 11/255.

Cebotari, A., 2008. Contingent Liabilities: Issues and Practice. *IMF Working Paper*, No. 08/245.

Clarke, D., & Mahul, O., 2011. Disaster Risk Financing and Insurance: Issues and Results. *World Bank Policy Research Working Paper*, No. 6056.

Cottarelli, C. (2011). *Fiscal Risk and Public Debt Sustainability*. IMF Staff Discussion Note.

Eyraud, L., & Wu, T. (2015). *Playing by the Rules: Reforming Fiscal Governance in Europe*. IMF Working Paper WP/15/67.

GFDRR (Global Facility for Disaster Reduction and Recovery), 2014. *Financial Protection Against Natural Disasters: An Operational Framework for Disaster Risk Financing and Insurance*. World Bank.

IMF (International Monetary Fund), 2016. *Analyzing and Managing Fiscal Risks—Best Practices*. Fiscal Affairs Department.

IMF, 2019. *Fiscal Transparency Handbook*. Washington, DC: International Monetary Fund.

IMF, 2023. *Republic of Serbia: Article IV Consultation Report*. Washington, DC: International Monetary Fund.

Ministry of Finance and Economy of Albania, 2024. *Annual Budget Documentation*. Tirana: Ministry of Finance.

OECD, 2015. *Recommendation of the Council on Budgetary Governance*. Paris: OECD Publishing.

World Bank, 2021. *Albania Country Economic Memorandum: Seizing the Growth Opportunities*. Washington, DC: World Bank.

World Bank, 2021. *North Macedonia: Enhancing Public Investment Management and PPP Governance*. Washington, DC: World Bank.

World Bank, 2023. *Western Balkans Regular Economic Report*. No. 24, Fall 2023.

World Bank, 2025. *Draft Disaster Risk Fiscal Assessment: Albania*. Washington, DC: World Bank.

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The intellectual structure and thematic evolution of middle-income trap research: A bibliometric analysis (2009–2025)

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Abstract

Despite the rapid growth of scholarly and policy interest in the middle-income trap (MIT) since its formal introduction in 2007, the literature remains fragmented, with limited efforts to systematically map its intellectual structure or thematic evolution. This study presents the first comprehensive bibliometric analysis of MIT research, covering 385 publications indexed in the Web of Science (2009–2025). Using a triangulated methodology that integrates Bibexcel for performance metrics, VOSviewer for co-authorship and keyword network mapping, and SciMAT for longitudinal thematic evolution, the study identifies the core trajectories, knowledge clusters, and strategic shifts that have shaped the field over time. Results reveal a dynamic research domain increasingly grounded in themes such as structural transformation, innovation capacity, institutional reform, and human capital development, with strong regional concentration in Asia and Latin America. Thematic evolution analysis demonstrates both conceptual maturation and persistent fragmentation, as the core notion of the MIT remains under-theorized and variably defined. By exposing the field's structural dynamics, dominant actors, and conceptual gaps, this study offers a critical roadmap for scholars, while providing policymakers with a consolidated view of the research frontiers most relevant to long-run growth and developmental upgrading.

Keywords: middle income trap, economic development, structural transformation, bibliometric analysis
Jel Codes: F63, O10

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1. Introduction

Since the mid-20th century, many developing economies have transitioned into middle-income status by leveraging low-cost labor and export-oriented growth strategies. Yet only a small subset have successfully advanced to high-income levels. Most remain trapped in what economists term the middle-income trap (MIT)—a prolonged period of economic stagnation in which rising wages erode cost competitiveness, while institutional and technological deficiencies hinder further progress (Agénor, 2017).

The term "middle-income trap" was first coined by Gill and Kharas (2007) to describe countries caught between low-income economies that retain cost advantages in labor-intensive production and high-income economies that thrive on innovation and advanced technology. Economies in this trap often lose their edge in low-wage manufacturing but fail to make the leap toward knowledge-intensive industries due to insufficient human capital, weak innovation systems, and underdeveloped institutions (Gill & Kharas, 2015). As a result, they struggle to maintain productivity growth and face mounting development challenges.

Despite the increasing relevance of the MIT in policy and academic debates, the literature remains conceptually fragmented and methodologically dispersed. While numerous empirical studies and case-specific analyses have emerged—particularly focused on Asia and Latin America—there has been no comprehensive effort to systematically map the intellectual structure, thematic evolution, or research dynamics of the field. This lack of synthesis makes it difficult to assess how the discourse has matured, where scholarly attention is concentrated, and which conceptual or regional blind spots persist.

This study is motivated by the need to address that gap. It presents the first bibliometric analysis of the middle-income trap literature, providing a panoramic view of the field's development from 2009 to 2025. Using a corpus of 385 publications indexed in the Web of Science, we deploy a triangulated methodological framework: Bibexcel is used for performance indicators, VOSviewer for co-authorship and keyword network mapping, and SciMAT for longitudinal thematic tracking. This integrated approach not only uncovers the most influential authors, institutions, and publications, but also reveals the evolution of key research themes such as structural transformation, innovation, productivity, governance, and regional trajectories.

In doing so, this paper makes three key contributions. First, it fills a major empirical and methodological void by synthesizing a dispersed body of literature through advanced bibliometric tools. Second, it provides a structured lens for understanding how the MIT debate has evolved across time, geography, and disciplines. Third, it offers scholars and policymakers a roadmap for identifying conceptual blind spots and setting future research agendas.

The paper is structured as follows. Section 2 outlines the methodological design. Section 3 presents the descriptive results. Section 4 analyzes the intellectual and collaborative networks. Section 5 explores the thematic dynamics across three periods. Section 6 concludes by highlighting key findings, unresolved debates, and policy implications.

2. Methodology

2.1. Data

This study draws upon the Web of Science (WoS) database to conduct a comprehensive literature review on the middle-income trap. WoS was selected for its robust coverage of high-quality academic publications, standardized citation indexing, and compatibility with bibliometric tools such as Bibexcel, VOSviewer, and SciMAT (Kong et al., 2022; Mongeon & Paul-Hus, 2016; Qiu et al., 2023). The search strategy began with a review of foundational studies in the field to identify relevant keywords. Based on this review, the query term TI = "middle income trap" was adopted as the core search phrase.

The search was executed on April 4, 2025, using a two-stage filtering process. Initially, the term was applied across "All Fields", yielding 544 documents. However, this broad scope returned a substantial number of irrelevant results. To improve precision, the search field was subsequently narrowed to "Topic", which restricts the query to the title, abstract, and author keywords. This refinement reduced the dataset to 461 documents. To further ensure relevance and analytical coherence, the dataset was

limited to peer-reviewed journal articles, books, and book chapters, resulting in a final sample of 385 records used for bibliometric analysis.

2.2. Methods Used in Bibliometric Analysis

Conducting a comprehensive review and classification of literature within a research domain is often a meticulous and time-intensive endeavor. Bibliometric analysis offers a systematic and replicable method to streamline this process by quantitatively evaluating scholarly output and visualizing structural patterns within the literature. This dual capacity not only enhances efficiency but also facilitates deeper insights into the intellectual architecture of a research field.

Bibliometric analysis encompasses two core dimensions: performance analysis and science mapping (Cobo et al., 2015). Performance analysis focuses on quantitative indicators such as the number of publications per year, citation counts, and h-index values, providing a snapshot of academic productivity and influence. Science mapping, in contrast, examines the relational structure of the field—offering network visualizations of co-authorship, institutional collaboration, geographic distribution, and keyword co-occurrence patterns. The integration of these methods enables the construction of a nuanced and multidimensional understanding of the scholarly landscape (Small,1999).

In this study, three complementary software tools were employed to operationalize the bibliometric framework: Bibexcel for performance metrics, VOSviewer for network mapping, and SciMAT for thematic evolution analysis. This triadic approach provides both breadth and depth, allowing for a robust exploration of the development and diversification of middle-income trap research over time.

2.2.1. Analytical Framework and Methodological Tools

To systematically examine the evolution and intellectual structure of the middle-income trap (MIT) literature, this study adopts an integrated bibliometric methodology that combines performance analysis and science mapping. Three specialized software tools—Bibexcel, VOSviewer, and SciMAT—are employed to operationalize this framework. Each tool contributes distinct analytical strengths, enabling a triangulated approach to capture both quantitative trends and relational patterns within the literature.

2.2.1.1. Bibexcel: Quantitative Performance Analysis

Bibexcel is a widely used tool for processing bibliographic data and extracting performance indicators from databases such as Web of Science. It facilitates the generation of descriptive statistics, including publication frequencies, citation distributions, and journal productivity metrics (Persson & Schneider, 2009; Jemghili, Taleb & Khalifa, 2021). In this study, Bibexcel is utilized to:

i. Identify the annual publication output of MIT-related research

ii. Visualize the distribution of publications across scholarly journals

iii. These metrics provide a foundational overview of the field's expansion and dissemination across outlets.

2.2.1.2. VOSviewer: Network Mapping and Relational Structures

VOSviewer is a dedicated bibliometric mapping tool that enables the visualization of co-occurrence and co-authorship networks based on bibliographic coupling, citation, and keyword data. Through the use of proximity-based clustering and node sizing algorithms, it reveals both the intensity and structure of scholarly collaboration and conceptual coalescence (Pauna et al. 2019; Jemghili, Taleb & Khalifa, 2021). In this study, VOSviewer is employed to examine:

i. The most frequently cited publications

ii. International co-authorship and country-level collaboration patterns

iii. Author-supplied keyword networks and thematic clusters

These analyses reveal the underlying social and intellectual configurations shaping MIT research.

2.2.1.3. SciMAT: Thematic Evolution and Strategic Mapping

SciMAT offers advanced capabilities for diachronic analysis, allowing researchers to explore how thematic emphases evolve over time. It generates strategic diagrams using the concepts of centrality and density—where centrality measures the external connectivity of a theme (its importance to the broader field), and density reflects the internal coherence of the thematic cluster (Callon et al., 1991; Cobo et al., 2015; Qiu et al., 2023). Based on these dimensions, themes are categorized as:

i. Motor themes (high centrality, high density)

ii. Basic and transversal themes (high centrality, low density)

iii. Developed but isolated themes (low centrality, high density)

iv. Emerging or declining themes (low centrality, low density)

SciMAT is applied in this study to trace the thematic evolution of MIT literature across three distinct periods: 2009–2013, 2014–2017, and 2018–2025. This approach enables the identification of both persistent and transitional research agendas.

2.2.1.4. Preprocessing and Keyword Harmonization

Prior to analysis, a thorough preprocessing of the bibliographic data was conducted. All author-defined keywords across the 385 selected documents were reviewed and harmonized by merging synonymous or closely related terms under standardized labels. This was essential to ensure semantic consistency in co-occurrence analysis and to prevent fragmentation of conceptually similar terms during clustering.

2.2.1.5. Analytical Workflow

The integrated bibliometric procedure followed four sequential stages:

i. Descriptive trend analysis of publication volume and journal distribution using Bibexcel

ii. Mapping of citation networks, co-authorship patterns, and keyword co-occurrence using VOSviewer

iii. Thematic clustering and diachronic mapping of concept evolution using SciMAT

iv. Synthesis of results into a strategic overview of the field’s development trajectory

This multi-method design provides both a macroscopic and longitudinal understanding of the MIT research domain. The overall methodological sequence is depicted in Figure 1.

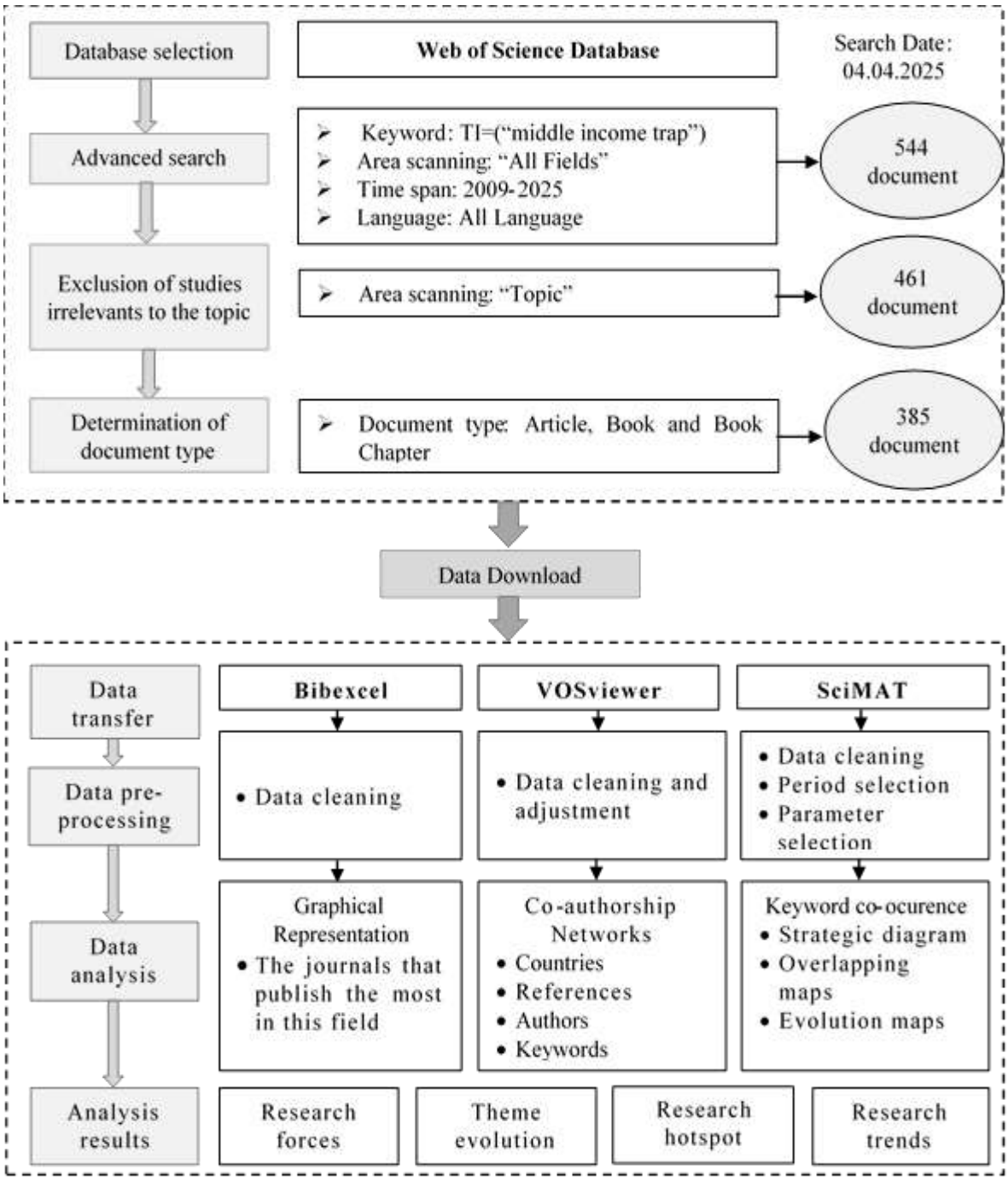

Figure 1. Outline of the Research Design

Source: Adapted by us from Qiu et al. (2023).

3. Descriptive Analysis

Prior to conducting the bibliometric analyses, a rigorous keyword harmonization process was undertaken to enhance the reliability and interpretability of the results. Given the variability in how authors label similar concepts, synonymous and semantically related keywords were standardized based on the most widely accepted terminology in the existing literature. This step was essential to avoid analytical distortions such as duplicate entries, fragmented clusters, or misrepresented thematic connections.

The harmonization was applied across all author-defined keywords extracted from the selected 385 publications. By consolidating variants under unified terms, the study ensured greater consistency in

both network visualizations and thematic evolution analyses. The full list of matched keywords is presented in Table 1.

Table 1. Synonymous Keywords

Matching Table for Keywords Determined by Authors	
middle-income trap	middle income trap; Middle Income Trap; middle‐ income; Income traps; middle income trap (MIT); middle-income traps; middle-income; Middle-income economy
economic growth	Economic growth; Growth; Economic growth type; economic growth theories
innovation	Innovativeness, innovation policy
growth slowdown	growth slow-down; Slowdown; Economic slowdown
convergence	Convergence Hypothesis; Economic convergence; real convergence
technological capability	Technological capabilities
technological catch- up	technological catching-up; technological progress; Technology upgrading; technological change; Technological development
structural transformation	Structural transformation; structural transformation of economy; structural change; structural break; structural reform; Structural change process
productivity	factor productivity; productivity growth; aggregate productivity
industrialization	Industrial development; industrial upgrading; new industrial revolution; industrial revolution
total factor productivity	factor productivity

3.1. Publication and Citation Trends

The temporal distribution of scholarly output and its corresponding citation intensity serves as a critical indicator of academic interest and the evolving significance of a research field. Figure 2 presents a dual-axis visualization of the annual number of publications (bar graph) and their citation frequencies (line graph) within the Web of Science (WoS) database. The earliest WoS-indexed publications on the middle-income trap (MIT) date back to 2009, just two years after the concept was formally introduced by Gill and Kharas (2007).

The development of the MIT literature can be broadly divided into three distinct periods:

2009–2013 (Conceptual Emergence and Framing): This initial stage marks the formative years of the field, during which foundational studies established the conceptual contours of the trap and drew connections between middle-income stagnation, structural transformation, and institutional deficits.

2014–2017 (Search for Policy Solutions): This period is characterized by a notable shift toward applied research, beginning with the publication of Eichengreen et al.'s influential article, “Growth Slowdowns Redux” (2014). Studies from this phase increasingly focus on identifying the conditions under which countries can escape the trap.

2018–2025 (Empirical Expansion and Thematic Diversification): This most recent phase commences with Aiyar et al.’s (2018) study “Growth Slowdowns and the Middle-Income Trap?”, which examines the influence of demography, infrastructure, macroeconomic policy, and trade composition. The period between 2019 and 2023 saw a surge in research activity, while a relative decline in publication volume was observed in early 2024 and 2025. However, despite this deceleration, the literature has become increasingly empirical, multidimensional, and solution-oriented, reflecting a maturation of the field and its closer alignment with policy-relevant outcomes.

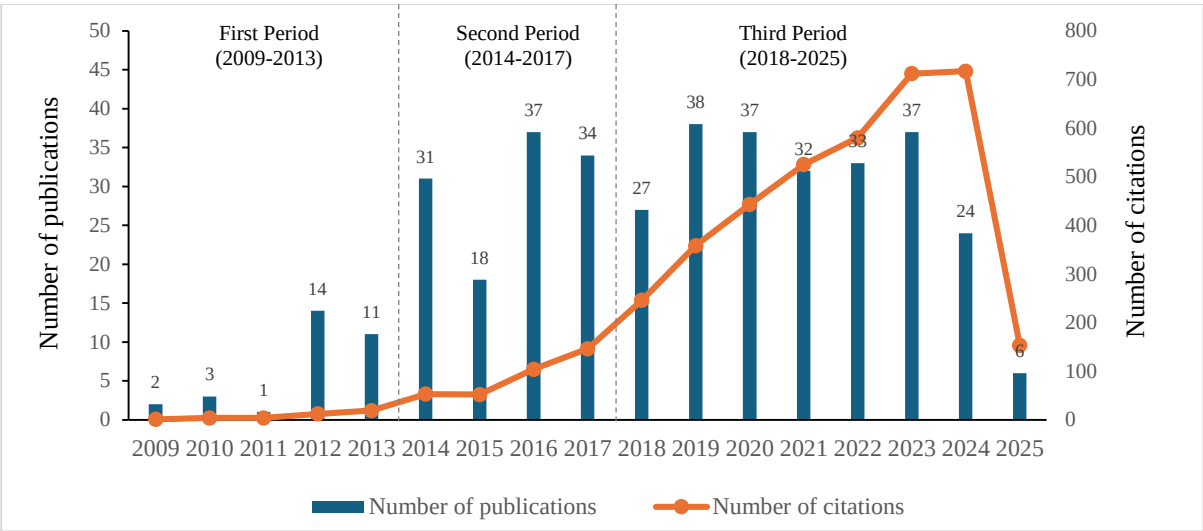

Figure 2. Distribution of Publications and Number of Citations by Year

3.2. Core Journals and Disciplinary Anchors

The distribution of publications across journals provides valuable insight into the disciplinary affiliations and thematic focus of a research field. Figure 3 presents the ten journals with the highest number of publications on the middle-income trap, offering a snapshot of the field's academic landscape.

Figure 3. The Most Widely Published Journals in this Field

The leading journal is Structural Change and Economic Dynamics, which aligns closely with the core concerns of the MIT literature—namely, productivity transitions, sectoral shifts, and long-run economic development. Notably, four of the top ten journals are based in Asia, reflecting the regional concentration of MIT studies, particularly in countries such as China, Malaysia, Thailand, and the Philippines.

Among the remaining journals, three are dedicated development journals, underscoring the intrinsic relationship between the middle-income trap and broader development processes. The concepts of development and the MIT are deeply intertwined, as the trap itself represents a developmental impasse in the trajectory toward sustained economic convergence.

Additionally, the journal Sustainability appears among the top publishers, highlighting the intersection between sustainable development and long-term structural challenges faced by middle-income countries. The inclusion of Maliye Dergisi, a journal published by the Ministry of Treasury and Finance

of the Republic of Türkiye, further underscores the relevance of the MIT in national development discourse—especially in countries actively grappling with the trap.

In sum, the common attributes of the most prominent journals in this field include:

i. A strong orientation toward economic development, structural transformation, or policy reform

ii. A regional or institutional proximity to countries affected by the middle-income trap

iii. An increasing focus on interdisciplinary approaches linking economics, public policy, and sustainability

4. Co-authorship Network Analysis

4.1. Country-Level Collaboration Patterns

Understanding the international collaboration landscape is critical for comprehending how countries engage with the middle-income trap (MIT) as both a shared developmental challenge and a subject of comparative inquiry. Given that countries experience the MIT through varying institutional, demographic, and structural contexts, cross-national scholarly collaboration offers the opportunity to compare trajectories, identify common determinants, and develop policy-relevant frameworks tailored to different regional realities.

Figure 4 presents the co-authorship network of countries contributing to MIT-related literature, where each node represents a country, the node size reflects its total publication output, and the thickness of the connecting lines (edges) indicates the strength of collaboration (Ding & Cronin, 2011). To ensure comprehensiveness while maintaining interpretability, the network includes all countries with at least one publication and one citation within the dataset.

The analysis identified six distinct country clusters, each color-coded in the visualization:

Yellow cluster: Led by China, this group includes Australia, Denmark, Belgium, and Colombia.

Purple cluster: Comprises the United States, Malaysia, and the Philippines (although the latter is not labeled, it is geographically adjacent to Malaysia).

Red cluster: Includes Turkey, Brazil, Germany, Portugal, Poland, Switzerland, and Norway, forming a diverse mix of European and emerging economies.

Green cluster: Consists of Japan, South Korea, Russia, Singapore, Thailand, Canada, and Taiwan (the latter is located near Japan but not labeled in the figure).

Blue cluster: Comprises the United Kingdom, Chile, Indonesia, Italy, and Vietnam.

Turquoise cluster: Contains only France and Spain, indicating strong bilateral collaboration between the two countries.

Among all contributors, China and the United States emerge as the most prolific, with 73 publications each. Notably, the strongest bilateral link in the co-authorship network is between these two countries—reflecting both the volume of collaborative research and the strategic importance of MIT-related issues in their respective policy agendas.

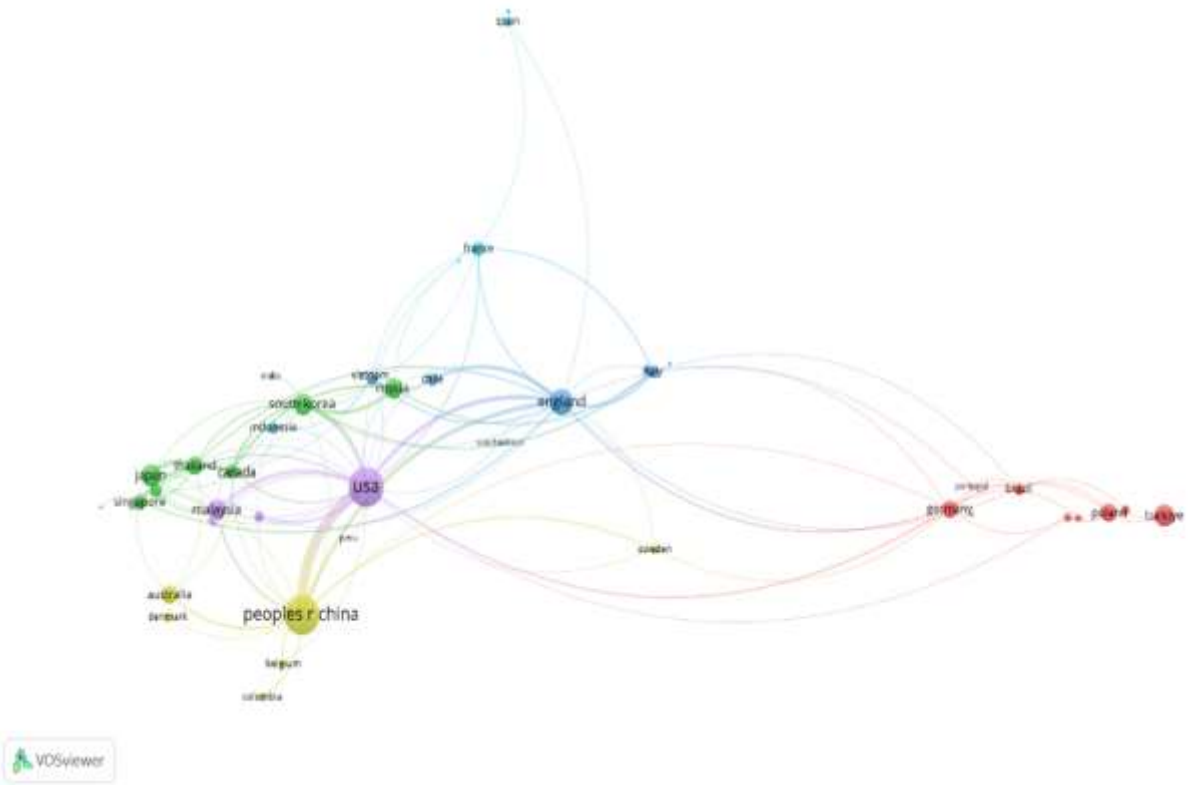

Figure 4. Co-authorship Networks among Countries

The map also highlights that research on the MIT is not confined solely to countries currently trapped at middle-income levels. Several high-income countries that have successfully avoided or escaped the trap—such as South Korea, the United States, the United Kingdom, and Japan—continue to play a central role in advancing research in the field. This suggests a broader academic interest in the institutional, structural, and macroeconomic dynamics that shape long-term development trajectories.

In particular, collaborations between countries that have escaped the trap and those still caught within it are of analytical and policy significance. The strong linkage between China and the United States exemplifies this pattern, providing a potential conduit for knowledge transfer, comparative policy learning, and joint theoretical refinement.

4.2. References

In bibliometric research, highly cited publications are generally regarded as having substantial academic influence and intellectual leadership within a given field (Small 1999). As visualized in Figure 5, the size of each node represents the citation volume, while the spatial proximity of nodes reflects thematic or citation-based connectivity. Larger and more centrally positioned nodes correspond to works that have exerted a foundational or path-defining influence on the development of middle-income trap (MIT) scholarship.

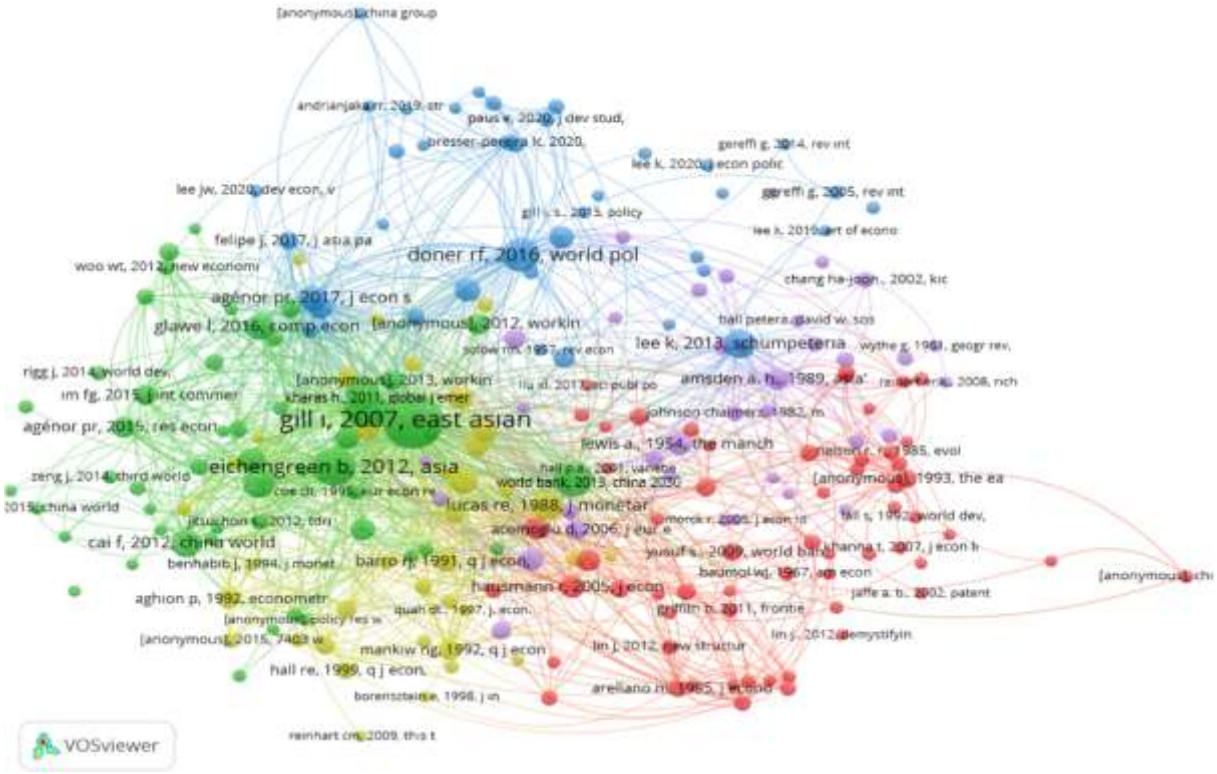

Figure 5. Co-citation Reference Network

At the center of the citation network lies the seminal work by Gill and Kharas (2007), An East Asian Renaissance: Ideas for Economic Growth. This book introduced the term "middle-income trap" into the development discourse and remains the intellectual anchor of the field. Its central placement and dominance in node size underscore its pioneering status and enduring relevance.

The second most influential node corresponds to the article by Eichengreen, Park, and Shin (2012) titled “When Fast-Growing Economies Slow Down: International Evidence and Implications for China.” This study investigates growth deceleration, a defining symptom of the MIT, and offers empirical evidence on the structural and macroeconomic drivers of slowdown episodes—particularly in middle-income economies.

The third major reference is the article by Kharas and Kohli (2011), “What Is the Middle Income Trap, Why Do Countries Fall into It, and How Can It Be Avoided?”. This paper provides conceptual clarity by defining the MIT in precise terms and examining the developmental dynamics that entrap countries in this income range. As a continuation of the ideas introduced in 2007, it further systematizes the discourse and proposes a framework for analysis and policy response.

Another critical node in the network is the World Bank’s 2013 report, China 2030: Building a Modern, Harmonious, and Creative Society. This comprehensive volume not only outlines strategic pathways for China’s economic transformation but also serves as a reference model for countries navigating similar structural challenges. It remains a cornerstone publication for MIT studies with a regional focus on East Asia.

The fifth major contribution is the article by Doner and Schneider (2016), “The Middle-Income Trap: More Politics Than Economics.” This work shifts the analytical lens by foregrounding the role of institutional and political barriers—arguing that failure to escape the MIT is often rooted less in economic mismanagement and more in governance weaknesses, policy incoherence, and elite capture. Its critical perspective has spurred a growing line of inquiry into the political economy of development stagnation.

Together, these highly cited works have shaped the conceptual foundations, empirical trajectories, and normative debates within MIT research. Their prominent positions in the citation network highlight both their individual influence and their cumulative role in defining the intellectual contours of the field.

4.3. Author Collaboration Networks

In bibliometric research, co-authorship network analysis provides valuable insights into the social structure of knowledge production, revealing the collaborative dynamics that shape the development of a research field. In the context of the middle-income trap (MIT), author-level collaboration patterns offer a window into the intellectual communities that have guided the field's theoretical, empirical, and policy evolution.

Figure 6 illustrates the co-authorship network of the most influential scholars working on MIT-related themes. The nodes represent individual authors, the size of each node indicates publication volume or influence, and the links between nodes denote the frequency and strength of co-authored work. Based on network clustering, the literature is structured into four distinct author clusters, each reflecting a different intellectual lineage or thematic orientation.

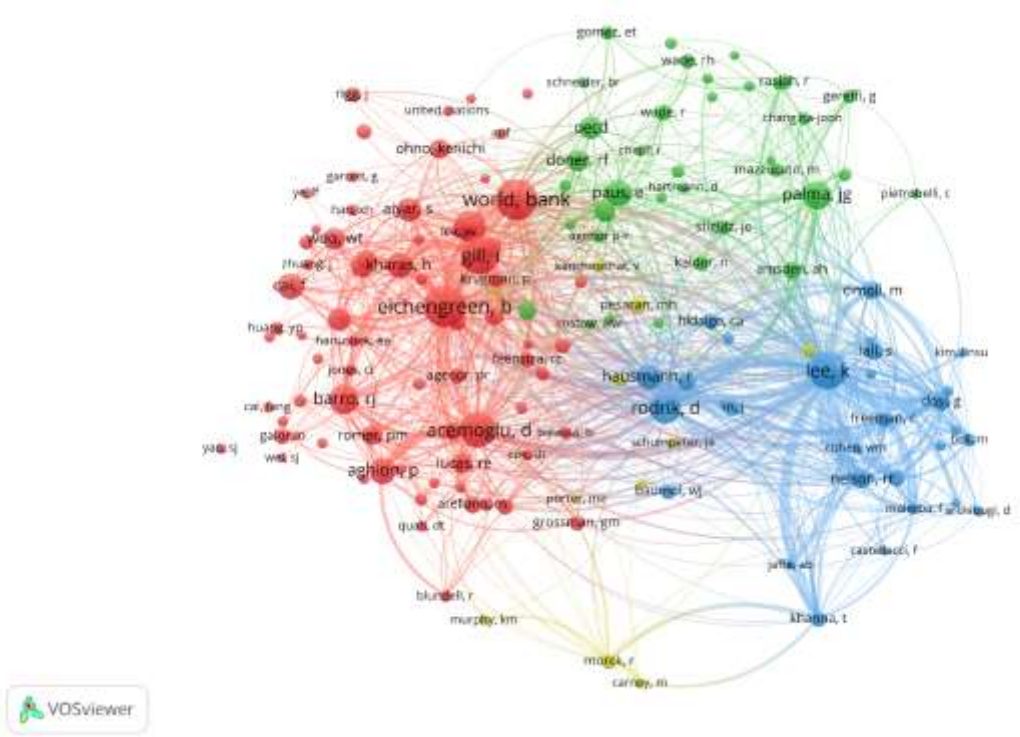

Figure 6. Co-authorship Networks between Authors

Red Cluster (Foundational Thinkers and Institutional Anchors): The red cluster contains scholars whose work forms the conceptual foundation of the MIT literature, including Gill, Kharas, Eichengreen, Felipe, and institutional authors such as the World Bank. These individuals have made defining contributions to the conceptualization of the trap and the empirical identification of its global manifestations. Notably, Daron Acemoğlu appears in this cluster despite not having authored MIT-specific studies; his influential work on institutions, governance, and inclusive growth provides strategic frameworks that are frequently cited in relation to MIT dynamics.

Blue Cluster (Innovation, Industrialization, and Development Strategy): The blue cluster centers on Lee, Rodrik, Hausmann, Nelson, and Dosi, forming a strong intellectual network focused on structural transformation, innovation systems, and industrial policy. These scholars approach the MIT from the perspective of long-term growth constraints, capability building, and technological upgrading. Their collaborations reflect a shared emphasis on overcoming institutional and industrial bottlenecks through innovation-led development strategies.

Green Cluster (Latin America, Inequality, and Policy Reform): The green cluster, led by Palma, Paus, and Doner, contributes a regionally focused and heterodox perspective to the field. Gabriel Palma (2011; 2019) has written extensively on Latin America and the structural causes of inequality, while Paus

(2012; 2014; 2020) has contributed to the literature with studies on international trade, innovation, and Latin American development. Doner's (2016) work emphasizes the political economy of development, arguing that the MIT is more a product of institutional failures and policy misalignments than of purely economic factors.

Yellow Cluster (Business Systems and Corporate Governance): The yellow cluster is led by Morck, Carney, and Murphy, and is primarily oriented around issues of corporate governance, business systems, and institutional collaboration. While this group contributes to the broader understanding of economic upgrading and private sector dynamics, it occupies a more peripheral position in the MIT literature. The relative marginality of this cluster reflects its narrower scope and more specialized focus.

4.4. Keywords and Conceptual Mapping

Keywords serve as vital descriptors of scholarly content, offering insights into the thematic orientation and conceptual focus of academic publications. In bibliometric analysis, frequently co-occurring keywords strengthen inter-publication linkages, facilitate the development of shared terminology within a field, and enhance the visibility and discoverability of studies during systematic literature searches. As such, the analysis of keyword networks provides a meaningful lens through which to understand the structure and evolution of a research domain.

Figure 7 presents the keyword co-occurrence network derived from author-defined keywords across the 385 publications in the sample. Using VOSviewer, a total of ten distinct keyword clusters were identified, each representing a thematic concentration within the middle-income trap (MIT) literature.

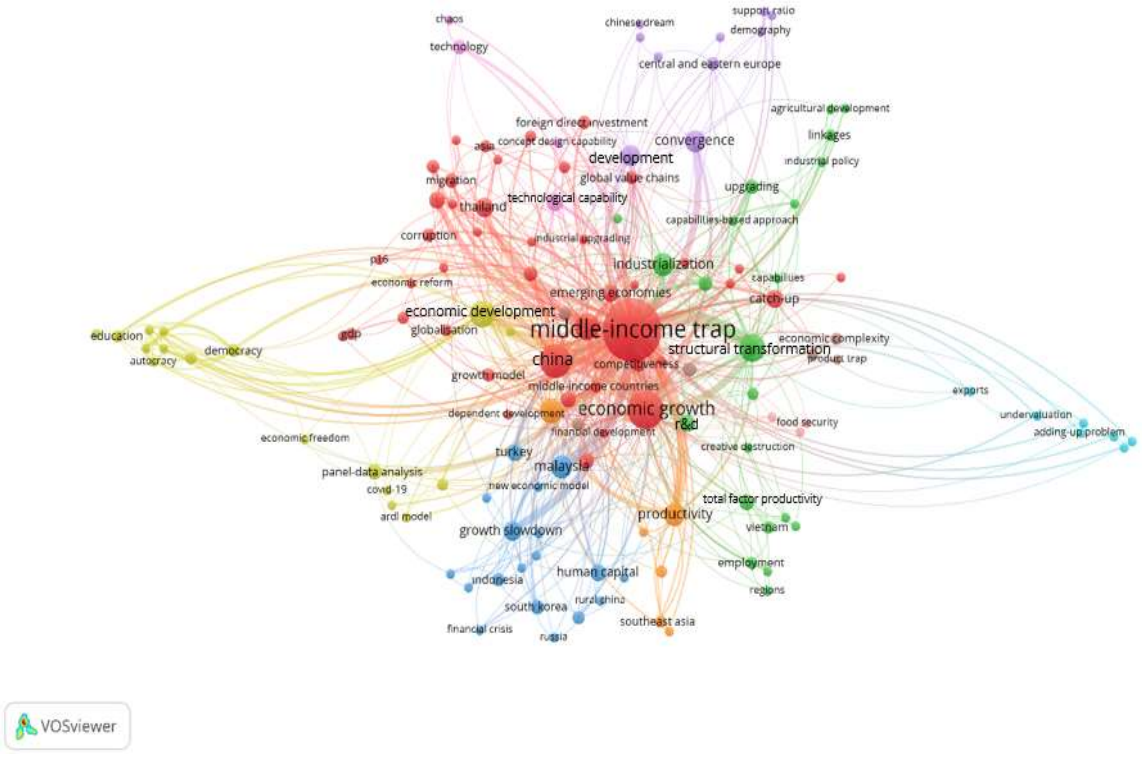

Figure 7. Co-authorship Networks between Keywords

Red Cluster (Core Concepts of the Field): At the center of the network, the red cluster contains the most frequently cited and conceptually central terms. These include: "Middle-income trap" (largest node and most connected term); "Economic growth" (second-largest node and most frequent co-occurrence); "China", which ranks third in size and reflects the country's prominent role in empirical studies; "Innovation", positioned adjacent to the MIT node, indicating its centrality in policy and theory.

This cluster captures the foundational discourse on the MIT and frames the debate around growth slowdowns and country-specific development trajectories, with China serving as the most studied case.

Green Cluster (Structural Determinants of Escape): The green cluster includes terms such as "Structural transformation" (third strongest link to "middle-income trap"); "R&D"; "Industrialization"; "Total factor productivity".

This cluster represents the mechanisms and capabilities necessary for countries to transition beyond middle-income status, emphasizing the importance of innovation systems and industrial upgrading.

Blue Cluster (Empirical Country Cases and Human Capital): The blue cluster is composed of "Growth slowdown", a symptom of stagnation in middle-income economies; "Human capital", a key enabling condition for sustained development; Country-specific terms like "Turkey," "Malaysia," "Indonesia," and "South Korea".

This grouping reflects both the diagnostic elements of the MIT and the regional focus of much of the literature, particularly in emerging Asian economies.

Yellow Cluster (Development Processes and Methodological Approaches): The yellow cluster brings together "Economic development", "Education", "Democracy", "Panel data analysis" and "ARDL model".

This cluster captures the intersection of socioeconomic factors and quantitative methodologies used in evaluating the determinants of the MIT.

Purple Cluster (Convergence and Demographic Dynamics): The purple cluster centers on "Convergence", a common analytical framework for measuring income mobility relative to developed countries, "Development" (the fourth-strongest co-occurring term with MIT), "Demography", which highlights the relevance of demographic transitions for human capital, "Central and Eastern Europe", indicating a regional sub-focus.

This cluster reflects the literature's macroeconomic and demographic orientation, linking structural development with convergence dynamics.

Turquoise Cluster (Trade and Valuation Perspectives): This smaller cluster includes "Economic transition", "Exports", "Undervaluation".

While these terms have relatively small nodes, they point to trade and currency strategies occasionally discussed as potential escape mechanisms.

Orange Cluster (Productivity and Regional Focus): Despite its limited size, the orange cluster includes "Productivity" (fifth most connected keyword to MIT), "Latin America", a region frequently cited in MIT-related stagnation studies.

The centrality of "productivity" underscores its diagnostic value for assessing economic transformation capacity.

Brown and Pink Clusters (Technological Depth and Product Space): Two peripheral clusters capture technological and structural sophistication: Brown: "Economic complexity" and "product trap"; Pink: "Technological capability" and "technology".

Though these terms appear infrequently, they reflect emerging discourses around innovation ecosystems and export sophistication as pathways out of the MIT.

In summary, the keyword co-occurrence map reveals a multi-layered conceptual structure that balances theoretical foundations (growth, innovation, development), empirical foci (country case studies, regional clusters), and applied themes (structural transformation, productivity, education). The prominence of terms like "economic growth," "structural transformation," and "human capital" affirms the multidisciplinary nature of MIT research, while peripheral clusters suggest areas for future expansion and integration.

5. Keyword Co-occurrence Analysis

5.1. Thematic Evolution and Strategic Mapping

To explore the intellectual development of the MIT literature, this study employed the SciMAT to generate strategic diagrams across three periods: 2009–2013, 2014–2017, and 2018–2025. Each strategic diagram visualizes the conceptual structure of the field at a given time, offering insights into the evolution of key research themes and their relative maturity, relevance, and integration.

Thematic clusters—represented as nodes in the diagrams—were formed by aggregating co-occurring keywords. The horizontal axis (centrality) measures a theme's connectivity to other themes (i.e., its relevance within the field), while the vertical axis (density) captures the internal coherence of the theme (i.e., how well-developed the topic is internally) (López-Robles et al., 2021; Bagheri et al., 2024).

Following the SciMAT framework (Salazar-Concha et al., 2021), strategic diagrams are divided into four quadrants:

Upper-right quadrant: Motor themes – high centrality and high density; conceptually mature and strategically important.

Upper-left quadrant: Highly developed but isolated themes – high density, low centrality; internally strong but peripheral to the field.

Lower-left quadrant: Emerging or declining themes – low density and centrality; conceptually weak or fading topics.

Lower-right quadrant: Basic and transversal themes – high centrality but low density; fundamental to the field, but not yet fully developed.

5.1.1. First Period (2009–2013): Conceptual Emergence and Foundational Framing

The first period marks the formative phase of MIT scholarship, comprising only 31 publications. During this time, the field began to coalesce around a small number of core issues.

As shown in Figure 8, ten thematic clusters were identified, classified as follows:

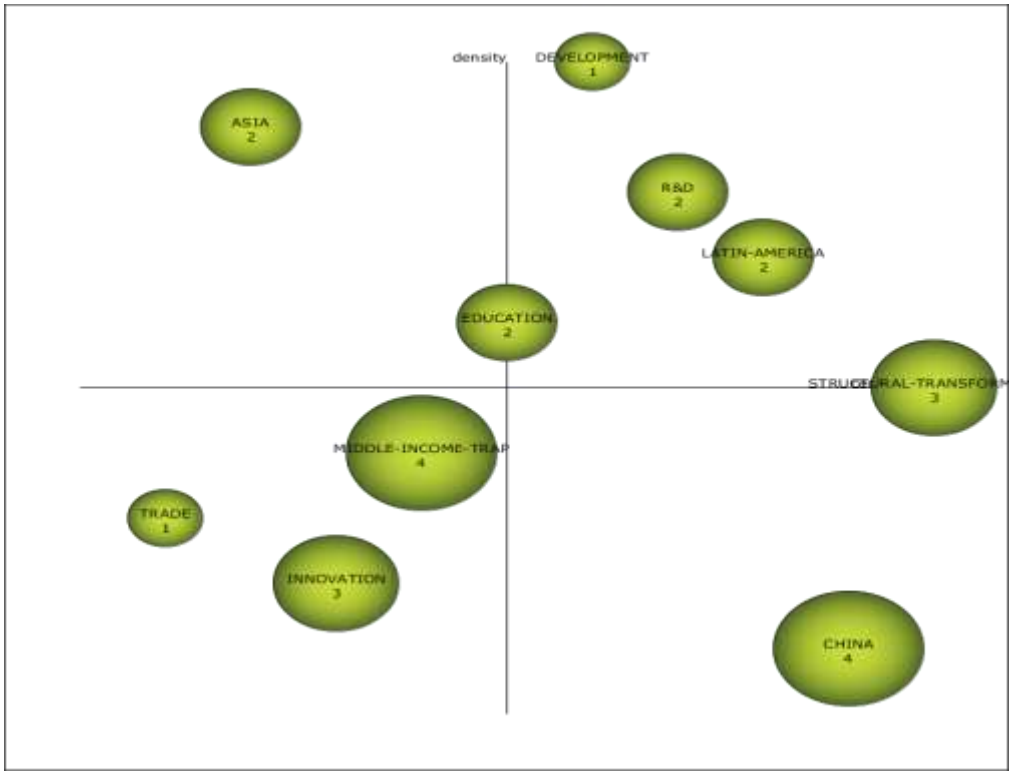

Figure 8. Strategic Diagram for the First Period (2009-2013)

Motor themes: R&D, Education, Structural Transformation, Latin America, and Development

Isolated theme: Asia

Emerging/declining themes: Trade, Middle-Income Trap, Innovation

Basic theme: China

This distribution reveals several important trends in the early conceptualization of the MIT:

R&D emerged as a dominant theme, reflecting early efforts to explain how innovation and technological upgrading are crucial for transitioning from labor-intensive to knowledge-intensive growth models. As many countries in the MIT are characterized by stagnant productivity, the prominence of this theme underscores the centrality of innovation systems in development discourse.

Closely linked to R&D, education was also identified as a motor theme. Education is understood as the foundation of human capital formation, which in turn supports research and innovation capacities.

Structural transformation, the shift from low-productivity to high-productivity sectors, was another central focus. Its position as a motor theme reflects growing academic consensus that escaping the MIT requires deep changes in economic structure, not merely incremental growth.

The Latin American region, home to numerous countries long identified with the trap (e.g., Brazil, Argentina, Mexico), also emerged as a motor theme. In contrast, while the Asian region was thematically coherent, its classification as isolated suggests it had not yet assumed a central position in the global discourse—an observation that would shift in later periods.

The presence of "middle-income trap" itself in the lower-left quadrant—as an emerging theme—aligns with its historical trajectory. This period represents the term's conceptual emergence, following Gill and Kharas's (2007) foundational work. As such, its peripheral status reflects its novelty and lack of widespread integration at the time.

Development, classified as a motor theme, reflects the field's theoretical grounding in the broader domain of development economics, encompassing not just economic growth but also institutional and social dimensions.

China, though appearing only as a basic theme, begins to take on importance due to its rapidly evolving growth trajectory and frequent use as a case study in MIT-related analyses.

To supplement the qualitative interpretation, performance indicators (e.g., publication count, h-index, citation volume) were also calculated for each theme and are presented in Table 2.

Table 2. Performance of themes in the first period (2009-2013)

Topics	Number of Publications	h-Index	Average Citation	Centrality	Density
R&D	2	2	173	40	65
EDUCATION	2	1	20	28.77	42.5
STRUCTURAL TRANSFORMATİON	3	3	20	56.79	39.11
LATIN-AMERICA	2	1	6.5	41.72	57.22
DEVELOPMENT	1	1	4	36.61	146.67
ASIA	2	2	10	17.91	130
TRADE	1	1	46	5.11	25
MIDDLE-INCOME-TRAP	4	2	19	27	27.27
INNOVATION	3	2	6.33	26.33	25
CHINA	4	2	1.75	48.7	16

In summary, the first period is characterized by a transition from conceptual diffusion to thematic crystallization. The foundational themes identified—R&D, education, structural change, and development—would shape the analytical core of subsequent research on the middle-income trap.

5.1.2. Second Period (2014–2017): Conceptual Expansion and Structural Deepening

The second period of analysis, covering the years 2014 to 2017, represents a phase of conceptual expansion and empirical consolidation in the middle-income trap (MIT) literature. A total of 120 publications were recorded during this interval, reflecting a significant growth in scholarly engagement with the topic. As shown in Figure 9, this period yielded 18 thematic clusters, classified according to SciMAT's strategic diagram typology as follows:

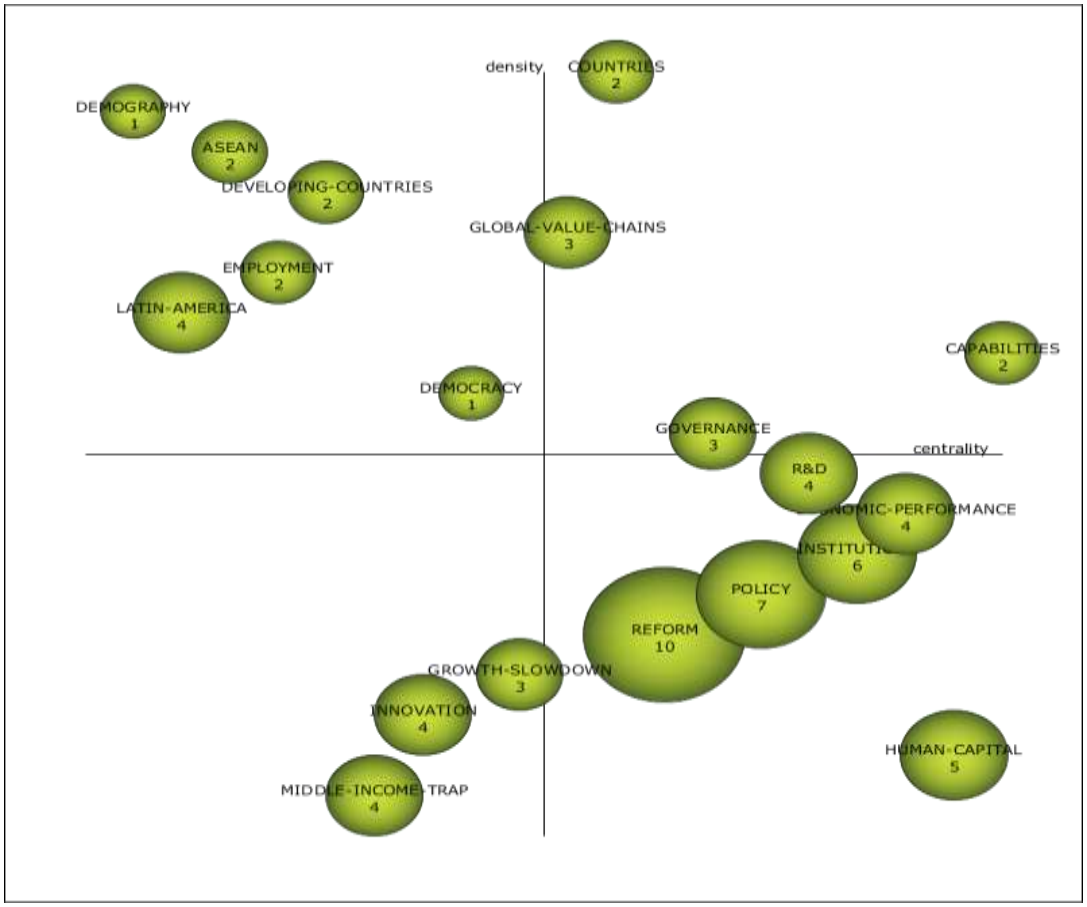

Figure 9. Strategic Diagram for the Second Period (2014-2017)

Motor themes: Global-Value-Chains, Capabilities, Governance, Countries

Isolated but internally developed themes: Employment, Democracy, Developing Countries, Latin America, ASEAN, Demography

Emerging or declining themes: Growth Slowdown, Innovation, Middle-Income Trap

Basic and transversal themes: Policy, R&D, Reform, Human Capital, Institutions, Economic Performance

The thematic landscape of this period reflects a transition from foundational framing to more differentiated and policy-relevant exploration. Several key developments define the structure of the field during this time:

Global Value Chains as a Dominant Theme: The most prominent motor theme—based on both strategic positioning and performance indicators (see Table 3)—is Global-Value-Chains (GVCs). The literature increasingly focused on the hypothesis that countries remain trapped at middle-income levels because they fail to upgrade within international production networks. Rather than simply participating in global

trade, the ability to move up the value chain—producing higher-value-added goods and services—became a focal point for understanding development blockages. This thematic shift reflects a broader global turn in development economics toward production structure and trade integration strategies.

Capabilities and Institutional Support: The theme of Capabilities also emerged as a motor theme, signaling growing recognition that country-specific endowments and institutional capacities critically mediate the likelihood of escaping the MIT. Scholars began to emphasize that even when facing similar structural barriers, countries' ability to innovate, implement policy, or leverage human capital depends on endogenous capacity. As such, capabilities became a conceptual bridge linking microeconomic firm-level factors to macro-level development trajectories.

Governance and Policy Alignment: Closely related to capabilities, the Governance theme reflects increased attention to the institutional prerequisites for successful transformation. This included analyses of bureaucratic quality, policy coherence, and rule of law—all recognized as central to enabling long-term productivity growth. Governance is framed not just as an administrative concern, but as a strategic enabler of reform and innovation systems.

The Continued Emergence of the Middle-Income Trap Concept: Interestingly, the keyword "Middle-Income Trap" itself remains classified as an emerging theme during this period. This positioning suggests that while the concept had gained traction since its introduction, it was still undergoing conceptual clarification and empirical validation. Similarly, Growth Slowdown—an observable symptom often associated with countries caught in the trap—also appears as an emerging theme. Its position is consistent with a parallel line of inquiry led by Eichengreen et al. (2014), which linked decelerating growth trajectories to structural and policy deficiencies in upper-middle-income countries.

Peripheral but Relevant Themes: Themes such as ASEAN, Demography, and Latin America appear in the upper-left quadrant, indicating well-developed but thematically isolated contributions. These region- or context-specific studies added depth to the literature but were not yet fully integrated into the core conceptual framework. Similarly, Human Capital, Policy, Institutions, and Reform are located in the lower-right quadrant, suggesting that while these topics were clearly connected to the MIT discourse, their theoretical frameworks and empirical applications were still maturing.

To supplement the qualitative interpretation, performance indicators (e.g., publication count, h-index, citation volume) were also calculated for each theme and are presented in Table 3.

Table 3. Themes' performance in the second period (2014-2017)

Topics	Number of Publications	h-Index	Average Citation	Centrality	Density
GLOBAL-VALUE-CHAINS	3	3	22.33	27.61	35.42
CAPABILITIES	2	2	14	49.69	25.56
GOVERNANCE	3	2	6	31.85	17.5
COUNTRIES	2	2	4	29.13	86.67
EMPLOYMENT	2	1	19	18.07	31.11
DEMOCRACY	1	1	13	25.85	22.25
DEVELOPMENT-COUNTRIES	2	2	10	20.02	36.11
LATIN-AMERICA	4	2	8.25	14.3	29.33
ASEAN	2	2	4.5	16.61	49.58
DEMOGRAPY	1	1	1	3.33	50
GROWTH-SLOWDOWN	3	2	26.67	25.89	7.58
INNOVATION	4	4	20.25	24.88	5.33
MIDDLE-INCOME-TRAP	4	1	1	23.66	1.27

POLICY	7	5	21.29	32.2	8.78
R&D	4	3	20.25	33.28	13.33
REFORM	10	6	19.7	31.67	8.73
HUMAN-CAPITAL	5	4	17.4	46.65	4.94
INSTITUTIONS	6	5	14.33	35.74	10
ECONOMIC-PERFORMANS	4	4	13.75	37.31	13.33

In summary, the 2014–2017 period reflects a conceptual maturation and policy intensification of the MIT literature. The emergence of GVCs, capabilities, and governance as motor themes illustrates a shift from early descriptive work toward actionable development strategies. The strategic map also highlights the beginning of a multi-scalar research agenda, in which firm-level, sectoral, institutional, and global trade perspectives are increasingly integrated into analyses of the middle-income trap.

5.1.3. Third Period (2018–2025): Thematic Diversification and Theoretical Reassessment

The third period, covering the years 2018 to 2025, marks the most expansive and analytically diverse phase in the evolution of the middle-income trap (MIT) literature. With a total of 234 publications, this period reflects a notable acceleration in academic interest following the foundational (2009–2013) and developmental (2014–2017) phases.

As illustrated in Figure 10, 23 thematic clusters emerged, distributed as follows:

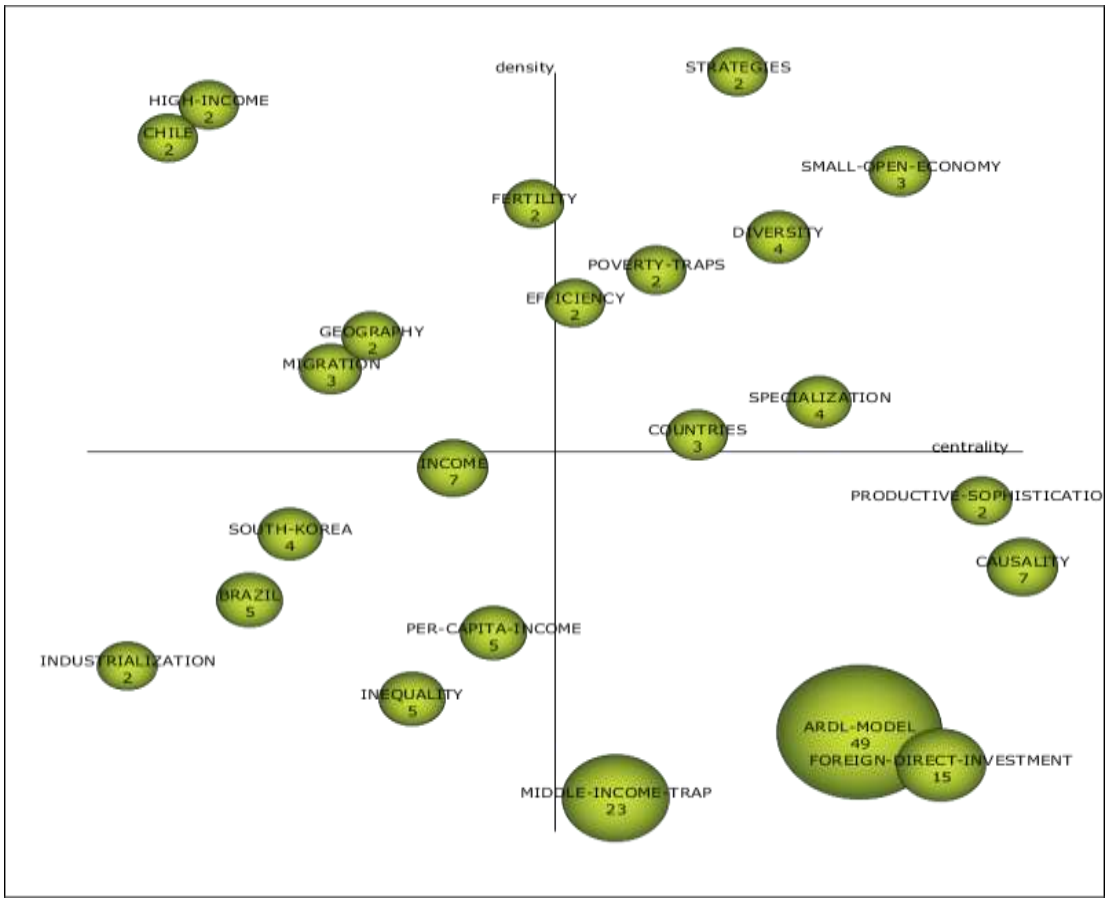

Figure 10. Strategic Diagram for the Third Period (2018-2025)

Motor themes (high centrality and high density): Countries, Strategies, Small-Open-Economy, Poverty Traps, Diversity, Efficiency, Specialization

Isolated but internally developed themes: Geography, Chile, Fertility, Migration, High Income

Emerging or declining themes: South Korea, Income, Per Capita Income, Brazil, Industrialization, Inequality

Basic and transversal themes: Productive Sophistication, Middle-Income Trap, Foreign Direct Investment, ARDL Model, Causality

The Poverty Trap as a Precursor to the Middle-Income Trap: Among the motor themes, Poverty Traps stands out as a critical conceptual addition. The literature increasingly recognizes that the MIT cannot be fully understood in isolation from earlier developmental constraints. The poverty trap, which refers to the inability of countries to escape low-income status due to structural and scale limitations, is now seen as a foundational stage that precedes the middle-income transition. This emerging framework suggests that unresolved issues in the poverty trap stage can persist and re-emerge as vulnerabilities at the middle-income level. Thus, the rise of "poverty trap" as a high-performance theme in this period reflects a more comprehensive, process-oriented approach to development trajectory analysis.

Diversification, Specialization, and Structural Constraints in Open Economies: Three additional motor themes—Diversity, Specialization, and Small-Open-Economy—build upon the value chain discourse that dominated the second period. These themes reflect an increasing focus on productive structure and trade dynamics in countries attempting to upgrade their position in global markets. Scholars in this period began interrogating whether small open economies are capable of achieving both product diversification and deep specialization, and under what conditions this dual transformation is feasible.

Product diversity is essential to buffer against sectoral shocks and enable innovation spillovers, while specialization is necessary to move up the value chain and increase value-added exports. However, small economies often lack the scale to pursue both simultaneously. This analytical tension has become a core debate within the third-period literature, particularly in the context of integration into global value chains (GVCs) and industrial policy design.

Efficiency as a Prerequisite for Upgrading: The emergence of Efficiency as a motor theme reflects a growing emphasis on the role of resource allocation, institutional effectiveness, and technological productivity in supporting both diversity and specialization. In this period, efficiency is increasingly positioned not merely as an outcome but as a strategic enabler of successful economic transformation, especially for economies facing structural or demographic constraints.

Middle-Income Trap (Increased Centrality, Limited Internal Coherence): A noteworthy observation is the shifting position of the "Middle-Income Trap" keyword itself. Unlike in the previous periods—where it was classified as an emerging theme—MIT is now positioned in the lower-right quadrant, indicating high centrality but relatively low density. This suggests that while the concept has become integral to the field, its internal theoretical development remains incomplete.

Despite growing usage and citation frequency, fundamental debates persist regarding:

i. The quantitative thresholds defining the trap
ii. The duration a country must remain at middle-income levels to be classified as "trapped"
iii. The conditions for escape and how long a country must sustain high-income status to be considered successful

These unresolved issues highlight a lack of theoretical consolidation, which continues to limit the field's analytical precision. The thematic map thus reflects a paradox: the middle-income trap has become central to development discourse, yet its conceptual boundaries remain contested, and its operationalization inconsistent across studies.

To supplement the qualitative interpretation, performance indicators (e.g., publication count, h-index, citation volume) were also calculated for each theme and are presented in Table 4.

Table 4. Themes' performance in the Third period (2018-2025)

Topics	Number of Publications	h-Index	Average Citation	Centrality	Density
COUNTRIES	3	2	21.67	21.57	7.3
STRATEGIES	2	1	19	22.89	27.5
SMALL-OPEN-ECONOMY	3	3	16.33	25.29	16.96
POVERTY-TRAPS	2	2	14.5	21.53	15
DIVERSITY	1	2	8.25	22.9	15.32
EFFICIENY	2	1	4.5	19.11	11.07
SPECIALIZATION	4	1	1.5	23.2	7.35
GEOGRAPY	2	1	37.5	16.46	9.92
CHILE	2	1	9	10.3	16.97
FERTILITY	2	1	3	16.8	15.8
MIGRATION	3	2	1.33	16.44	7.5
HIGH INCOME	2	1	1	14.25	21.17
SOUTH-KOREA	4	3	12.75	15.68	7.14
INCOME	7	4	10	16.59	7.21
PER-CAPITA-INCOME	5	3	8.2	16.69	3.09
BRAZIL	5	3	3	14.87	3.98
INDUSTRIALIZATION	2	2	3	4.94	2.5
INEQUALITY	5	2	1	16.59	2.17
PRODUCTIVE-SOPHISTICATION	2	2	22	28.67	7.19
MIDDLE-INCOME-TRAP	23	10	12.78	19.31	0.36
FOREIGN-DIRECT-INVESMENT	15	6	7.87	28.35	1.23
ARDL MODEL	49	10	7.47	24.64	1.79
CAUSALITY	7	3	2.71	32.42	6.85

In sum, the third period is characterized by a broadening of analytical scope, incorporating upstream development challenges (poverty traps), sectoral transformation dynamics (diversity, specialization, efficiency), and cross-cutting macroeconomic structures (small open economies). The field has matured substantially in empirical richness, yet still seeks greater theoretical integration and definitional consensus to advance as a unified research program.

5.2. Overlap Graph and Thematic Evolution Map

To capture the longitudinal development of research within the middle-income trap (MIT) literature, this study employed SciMAT to construct both an overlap graph and a thematic evolution map. These visualizations allow for a dynamic, periodized representation of how research topics emerge, persist, or diverge over time—offering a deeper understanding of the field's internal continuity and expansion.

Figure 11 presents the overlap graph, which illustrates the degree of thematic stability and transformation across three defined periods: 2009–2013, 2014–2017, and 2018–2025. In this figure, the numbers inside the circles indicate the total number of keywords identified within each period. Upward-pointing arrows denote keywords that disappear in the transition to the next period, while downward-pointing arrows represent newly introduced terms. Horizontal arrows capture the number of overlapping

keywords between successive periods, with the number outside the parentheses indicating the absolute count and the value within parentheses denoting the stability index (Salazar-Concha et al., 2021).

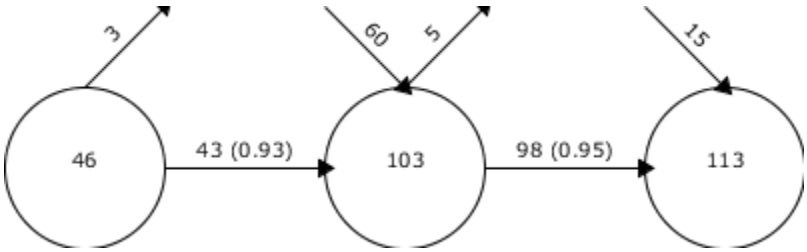

Figure 11. Overlap Graph

The results point to a consistent enrichment of the field over time. In each successive period, the number of new keywords exceeds the number of disappearing terms, signifying both conceptual diversification and thematic renewal. Moreover, the increasing number of overlapping terms and the high stability indices—0.93 between the first and second periods and 0.95 between the second and third—indicate a high degree of conceptual continuity. This suggests that the MIT literature has matured along a stable trajectory, gradually incorporating new dimensions while retaining a strong foundational core.

Complementing this, Figure 12 illustrates the thematic evolution map, which traces the transformation and interconnection of clustered themes across the same three periods. Each column represents a temporal segment, while each node corresponds to a thematic cluster. The size of the nodes reflects the number of publications associated with each theme, and the lines connecting nodes indicate the continuity or divergence of topics across periods. Solid lines represent direct thematic continuity, whereas dashed lines denote thematic differentiation. The thickness of the lines signifies the intensity of keyword overlap: thick solid lines indicate robust continuity, while thick dashed lines suggest strong thematic heritage despite transformation (Cobo et al. 2012).

Several key observations emerge from this thematic trajectory:

In the first period, the dominant themes include “CHINA” and “MIDDLE-INCOME-TRAP”, which serve as foundational anchors for subsequent scholarly inquiry.

In the second period, themes such as “POLICY”, “REFORM”, and “INSTITUTIONS” rise to prominence, reflecting a shift from conceptual framing to policy-oriented analysis.

In the third period, “MIDDLE-INCOME-TRAP” remains central, now joined by methodological themes like “ARDL MODEL”, signaling a growing emphasis on empirical precision.

Strong thematic continuities are visible in several areas. Notably:

The thickest solid lines appear between “ASIA” (Period 1) and “ASEAN” (Period 2), “R&D” (Periods 1 and 2), and “EDUCATION” (Period 1) and “HUMAN CAPITAL” (Period 2). These connections highlight stable conceptual lineages and sustained interest in capacity-building themes.

Among the dashed lines, a notable link connects “LATIN AMERICA” (Period 1) with “POLICY” (Period 2), suggesting a thematic shift from regional focus to institutional reform discourse, underpinned by a shared conceptual foundation.

Taken together, these findings underscore the increasing thematic complexity and analytical depth of the MIT literature over time. While the first period is marked by a relatively limited number of themes and weaker inter-thematic transitions, the second and third periods show a clear acceleration in thematic diversification and evolutionary potential. This trend reflects the field’s transition from early conceptual exploration to more sophisticated, policy-relevant, and methodologically robust scholarship.

Figure 12 shows the origin of clustered topics and their relationship with each other. Columns represent periods; nodes represent clustered themes; the size of nodes shows the number of publications of the relevant theme. The connection lines between nodes express the flow of data. They are divided into two as dashed and solid lines. Dashed lines indicate that topics are differentiated; solid lines indicate topic continuity; the thickness of lines shows the strength of connections. Solid thick lines represent topic

continuities with strong connections. Dashed thick lines indicate that although topic differentiation occurs, keywords that continue between topics have high connectivity (Cobo et al. 2012). According to Figure 12, the increase in research themes throughout the process indicates that the content of the subject has been enriched and a significant evolution has taken place in the relevant field. "CHINA" and "MIDDLE-INCOME-TRAP" in the first period, "REFORM," "POLICY," and "INSTITUTIONS" in the second period, and "ARDL-MODEL" and "MIDDLE-INCOME-TRAP" in the third period are the most studied themes. Additionally, among the solid lines in the first period, the thickest connections are between "ASIA" in the first period and "ASEAN" in the second period; between "R&D" in the first period and "R&D" in the second period; between "EDUCATION" in the first period and "HUMAN CAPITAL" in the second period. Among the dashed lines, it is between "LATIN AMERICA" in the first period and "POLICY" in the second period. Therefore, this means that the stability between these themes is supported by a strong thematic heritage relationship. In general, the number of themes in the first period is low and its ability to evolve is relatively weak compared to other periods. In subsequent periods, the number of themes and the ability of themes to evolve increased.

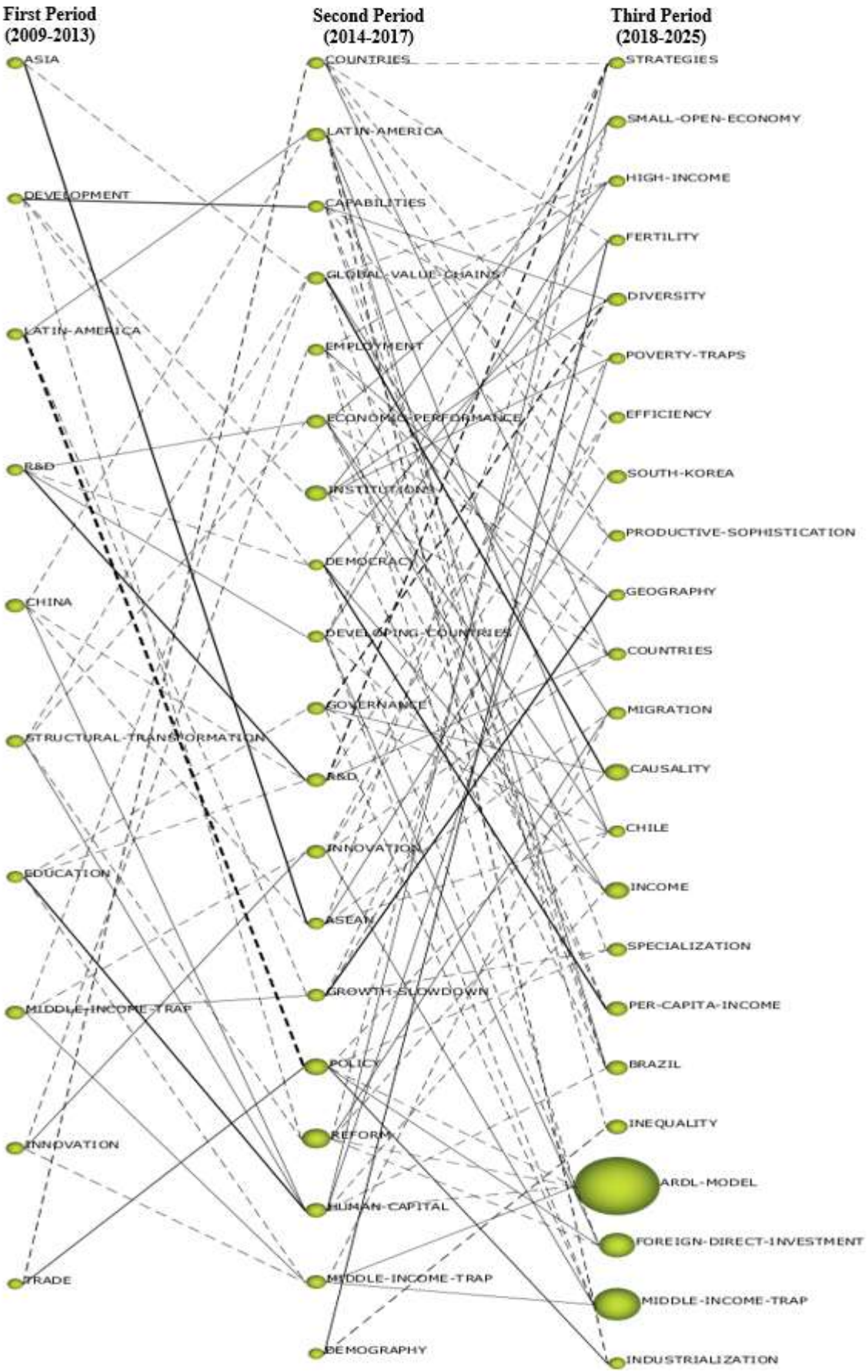

Figure12. Thematic Evolution Map

6. Conclusion

This study provides the first systematic bibliometric mapping of the scholarly discourse surrounding the middle-income trap (MIT)—a concept that, since its formal articulation in 2007, has become a defining concern within development economics. Leveraging a dataset of 385 publications indexed in Web of Science between 2009 and 2025, and employing three complementary tools—Bibexcel, VOSviewer, and SciMAT—this research offers a detailed portrait of the field's evolution, from conceptual emergence to empirical and thematic diversification.

Unlike traditional literature reviews, this bibliometric approach enables a more precise and multi-layered examination of the field. Through performance analysis and science mapping, we identify key contributors, thematic concentrations, and collaborative patterns that have shaped how the MIT has been understood, debated, and operationalized over time. In doing so, the study not only charts the terrain of existing research but also clarifies where theoretical consolidation remains absent and where empirical gaps persist.

Three central conclusions arise from this analysis.

First, the MIT should not be regarded as a fixed condition or static typology, but rather as an evolving analytical framework that reflects broader transformations in development thinking. The growing prominence of the "poverty trap" theme in recent years, particularly in the third period of analysis (2018–2025), indicates a more integrated perspective on long-term development. Scholars increasingly recognize that the barriers faced at the middle-income stage are often rooted in constraints inherited from earlier phases of growth. This shift reflects a move from treating the MIT as a symptom to understanding it as part of a longer developmental continuum.

Second, the regional and disciplinary structure of the field reveals clear spatial and intellectual clustering. Asia—particularly countries such as China, Malaysia, Thailand, and South Korea—emerges as both the geographic focus and institutional driver of much of the literature. This is reflected not only in case study selection but also in the origin of leading journals and collaborative networks. However, the inclusion of countries such as Brazil, Turkey, and others in Latin America demonstrates that the MIT is not a regionally bounded issue. Rather, it presents a global challenge whose dynamics are shaped by context-specific institutional, demographic, and structural variables.

Third, while the MIT has become increasingly central to development discourse, it remains theoretically underdeveloped. Its bibliometric position—marked by high centrality but moderate density—underscores this paradox. Despite widespread usage in policy and academic circles, the concept continues to lack clear definitional boundaries: there is still no consensus on how long a country must remain in the middle-income range to be considered "trapped," what qualifies as "escape," or how to quantify the thresholds of transition. This conceptual ambiguity limits the coherence of the field and signals the need for further theoretical refinement.

Taken together, these findings provide both diagnostic clarity and forward-looking insight. For scholars, this study highlights underexplored intersections between development theory, political economy, and institutional change—pointing toward the need for more integrative and interdisciplinary models. For policymakers, particularly in countries seeking to break through the middle-income barrier, the findings offer an evidence-based synthesis of the factors most frequently associated with stagnation and success. Issues such as structural transformation, technological upgrading, productivity, R&D investment, and education consistently emerge as focal points for reform and strategic intervention.

Ultimately, bibliometric analysis offers more than a retrospective account of scholarly production; it provides a conceptual roadmap for the field's future trajectory. As global development challenges become more complex, fragmented, and interdependent, understanding the structural impediments to long-term growth—such as those embedded in the middle-income trap—will be essential. A more cohesive, empirically grounded, and theoretically robust MIT literature is thus not only desirable, but necessary, to inform both research agendas and policy frameworks moving forward.

References

Agénor, P. R., 2017. Caught in the Middle? The Economics of Middle-Income Traps. Journal of Economic Surveys, 31(3), 771-791. Available at: https://onlinelibrary.wiley.com/doi/full/10.1111/joes.12175?casa_token=8bUjhltQ-4IAAAAA:W5OxxZQv33XG8QQzmgqY2CtL4GmswvM2cyq0x03EoPLic5mI8SoY_DH5YEp30fW8qxupAEb_rTCLle72

Aiyar, S., Duval R., Puy D., Wu Y., & Zhang L. (2018). Growth slowdowns and the middle-income trap. *Japan and the World Economy 48*, 22-37. Available at: https://www.sciencedirect.com/science/article/pii/S0922142518300823?casa_token=ZfDob-ysPQQAAAAA:JjdOksxwGwuf7_117EzcihQXd2_1Tn3dsjLM_SjxoRFdf9zQZzTHfq1WHU9LtErDmrg_juofab4

Bagheri, B., Azadi H., Soltani A., & Witlox F. (2024). Global city data analysis using scimat: A bibliometric review. *Environment, Development and Sustainability 26*(6), 15403-15427. Available at: https://link.springer.com/content/pdf/10.1007/s10668-023-03255-4.pdf

Callon, M., Courtial J. P., & Laville F. (1991). Co-word analysis as a tool for describing the network of interactions between basic and technological research: The case of polymer chemsitry. *Scientometrics*, *22*(1), 155–205. Available at: https://link.springer.com/content/pdf/10.1007/BF02019280.pdf

Cobo, M. J., Lopez-Herrera A. G., Herrera-Viedma E., & Herrera F. (2012). Scimat: A new science mapping analysis software tool. *Journal of the American Society for Information Science and Technology*, *63*(8), 1609–1630. Available at: https://onlinelibrary.wiley.com/doi/pdfdirect/10.1002/asi.22688?casa_token=ufVKCZtlmksAAAAA:9jeShHB_GK4bUn6UXrMwalaVFzFuzypzSRlGqAf8IhufdCT7rjMjiv_vmGfkyb8LJpBl06KoBDuwQXsA

Cobo, M. J., Martinez M. A., Gutierrez-Salcedo M., Fujita H., & Herrera-Viedma E. (2015). 25 years at knowledge-based systems: A bibliometric analysis. Knowledge-Based Systems 80, 3–13. Available at: https://www.sciencedirect.com/science/article/pii/S0950705115000076?casa_token=oU-pln63kCQAAAAA:57czYOH3qkD3MzPFVKVV53JKW6eRxaSgUrvNSK3egiSBG-v7tK_0lm-1mJG09BcspAliltMaxPA

Ding, Y. & Cronin B. (2011). Popular and/or Prestigious? Measures of Scholarly Esteem. *Information Processing & Management 47*(1), 80–96. Available at: https://www.sciencedirect.com/science/article/pii/S0306457310000087?casa_token=tcoUDWltXgoAAAAA:pOxgW75qghEd13umY1EL2jkD0ePOkgdMzPmMlK0P3c1X2pHmlStxQoxRHY6dGYWR3gY2BlhLdw0

Doner, R. F. & Schneider B. R. (2016). The Middle-Income Trap: More Politics than Economics. *World Politics 68*(4): 608-644. Available at: https://www.jstor.org/stable/pdf/26347364.pdf?casa_token=1U_bo6ZUShwAAAAA:uAljY2GfkIselvH1TjwRmprrbmZ2F_0YyrCwM_w77wQUcwG7ByO4vkuRQVLaI2TrxoQY7qNAWC2EwxoG3aaTnLNgwqHwQIXpMp81qoRSEcaf5ie_A5qS

Eichengreen, B., Park D., & Shin K. (2012). When fast-growing economies slow down: international evidence and implications for China. *Asian Economic Papers 11*(1), 42-87. Available at: https://scholar.google.com/scholar?hl=tr&as_sdt=0%2C5&q=Eichengreen%2C+B.%2C+Park+D.%2C+%26+Shin+K.+%282012%29.+When+fast-growing+economies+slow+down%3A+international+evidence+and+implications+for+China.+Asian+Economic+Papers+11%281%29%2C+42-87.+&btnG=

Eichengreen, B., Park D., & Shin K. (2014). Growth slowdowns redux. *Japan and the World Economy 32*, 65-84. Available at: https://www.sciencedirect.com/science/article/pii/S0922142514000437?casa_token=crFi7_ie4CAAAAAA:CPDDyfM2vSdgSGe-0flO0sVmuLHdhZ5wirc82I0HMzyY4ueGv0TgvxtemCF6KJ4LMSrJUtM1bwQ

Gill, I. S. & Kharas H. (2007). An East Asian Renaissance: Ideas for Economic Growth. World Bank Publications. (ABD 2007). Available at: https://documents.worldbank.org/en/publication/documents-reports/documentdetail/517971468025502862/an-east-asian-renaissance-ideas-for-economic-growth

Gill, Indermit S. & Kharas Homi. (2015). The Middle-Income Trap Turns Ten. Policy Research Working Paper No.7403. Available at: https://scholar.google.com/scholar?hl=tr&as_sdt=0%2C5&q=Gill%2C+Indermit+S.+%26+Kharas+Homi.+%282015%29.+The+Middle-Income+Trap+Turns+Ten.+Policy+Research+Working+Paper+No.7403&btnG=

Glawe, L. & Wagner H. (2016). The Middle-Income Trap: Definitions, Theories and Countries Concerned—A Literature Survey. *Comparative Economic Studies 58*, 507-538. Available at: https://link.springer.com/article/10.1057/s41294-016-0014-0

Jemghili, R., Ait A., & Khalifa M. (2021). A bibliometric indicators analysis of additive manufacturing research trends from 2010 to 2020. *Rapid Prototyping Journal 27*(7), 1432-1454. Available at: https://scholar.google.com/scholar?hl=tr&as_sdt=0%2C5&q=Jemghili%2C+R.%2C+Ait+A.%2C+%26+Khalifa+M.+%282021%29.+A+bibliometric+indicators+analysis+of+additive+manufacturing+research+trends+from+2010+to+2020.+Rapid+Prototyping+Journal+27%287%29%2C+1432-1454.+&btnG=

Kharas, H. & Kohli H. (2011). What is the Middle Income Trap, why do Countries Fall Into It, And How Can it be Avoided?. *Global Journal of Emerging Market Economies 3*(3), 281-289. Available at: https://journals.sagepub.com/doi/abs/10.1177/097491011100300302

Kong, H., Wang K., Qiu X., Cheung C., & Bu N. (2022). 30 years of artificial intelligence (aı) research relating to the hospitality and tourism industry. *International Journal of Contemporary Hospitality Management 35*(6), 2157-2177. Available at: https://www.emerald.com/insight/content/doi/10.1108/ijchm-03-2022-0354/full/pdf?casa_token=N5JzztRtLn4AAAAA:OSqApS311wlkJRFUROEhERuYX4nxHKrB0uq3Xgqyib2vOz_FrB4KSmwgQDWrfRQVpqMFamebO8K4KzIHLAgInCEe0GLmSHqyquAyKwnoG9Qk5ilhxEF2

Liu, X., Schwaag S., Tagscherer U., & Chang Y. (2017). Beyond catch-up—can a new innovation policy help China overcome the middle income trap?. *Science and Public Policy 44*(5), 656-669. Available at: https://scholar.google.com/scholar?hl=tr&as_sdt=0%2C5&q=Liu%2C+X.%2C+Schwaag+S.%2C+Tagscherer+U.%2C+%26+Chang+Y.+%282017%29.+Beyond+catchup%E2%80%94can+a+new+innovation+policy+help+China+overcome+the+middle+income+trap%3F.+Science+and+Public+Policy+44%285%29%2C+656-669.+&btnG=

López-Robles, J. R., Cobo M. J., Gutiérrez-Salcedo M., Martínez-Sánchez M. A., Gamboa-Rosales N. K., & Herrera-Viedma E. (2021). 30th anniversary of applied intelligence: a combination of bibliometrics and thematic analysis using scimat. *Applied Intelligence 51*, 6547-6568. Available at: https://link.springer.com/article/10.1007/s10489-021-02584-z

Mongeon, P. & Paul-Hus A. (2016). The Journal Coverage of Web of Science and Scopus: A Comparative Analysis. *Scientometrics 106*(1), 213–228. Available at: https://link.springer.com/article/10.1007/s11192-015-1765-5

Murgado-Armenteros, E. M., Gutiérrez-Salcedo M., Torres-Ruiz F. J., & Cobo M. J. (2015). Analysing the conceptual evolution of qualitative marketing research through science mapping analysis. *Scientometrics 102*(1), 519–557. Available at: https://link.springer.com/article/10.1007/s11192-014-1443-z

Palma, J. G. 2011. Homogeneous Middles vs. Heterogeneous Tails, and the end of the 'İnverted-U': It's all about the Share of the Rich. Development and Change 42(1), 87-153. Available at: https://onlinelibrary.wiley.com/doi/pdf/10.1111/j.1467-7660.2011.01694.x?casa_token=jXK_eeAvtwMAAAAA:3Pe47iRlk-ebGi_fpdXFN_dAp7dOQ57MjhLaYh4tbrsAs0Cs8Zj0Q-ZuexF6mllOBt-IKhmgRki2eXq_

Palma, J. G. 2019. Behind the Seven Veils of Inequality. What if it's all about the Struggle within just One Half of the Population over just One Half of the National Income?. Development and Change 50(5), 1133-1213. Available at: https://onlinelibrary.wiley.com/doi/pdf/10.1111/dech.12505

Pauna, V. H., Buonocore E., Renzi M., Russo G. F., & Franzese P. P. (2019). the ıssue of microplastics in marine ecosystems: A bibliometric network analysis. *Marine Pollution Bulletin 149*, 110612. Available at: https://www.sciencedirect.com/science/article/pii/S0025326X1930760X?casa_token=V1LFXdz2I6cAAAAA:RswTcbdjOttuAWaUo8B9X0qXV8JOPP7oHyyiWoZEQa6Qo6_uTJd-4vfRZc2h2Qvi7OYvgEGfM2w

Paus, E. 2012. Confronting the Middle Income Trap: İnsights from Small Latecomers. Studies in Comparative İnternational Development 47, 115-138. Available at: https://link.springer.com/article/10.1007/s12116-012-9110-y

Paus, E. 2014. Latin America and the middle income trap. ECLAC, Financing for Development Series (250). Available at: https://scholar.google.com/scholar?hl=tr&as_sdt=0%2C5&q=Paus%2C+E.+2014.+Latin+America+and+the+middle+income+trap.+ECLAC%2C+Financing+for+Development+Series+%28250%29.+&btnG=

Paus, E. 2020. Innovation strategies matter: Latin America's middle-income trap meets China and globalisation. The Journal of Development Studies 56(4): 657-679. Available at: https://www.tandfonline.com/doi/pdf/10.1080/00220388.2019.1595600?casa_token=QJFe-ND15kEAAAAA:lL2sFvFVW4sKm_Qpp4X5T4o_4mGP96VfCAv3F788NEf0VxE-oH-1v68iiUmS3QP8pOG7FxPrydldaYY

Persson, O., Danell R. & Schneider J. W. (2009). How to use bibexcel for various types of bibliometric analysis. *Celebrating Scholarly Communication Studies: A Festschrift for Olle Persson at his 60th Birthday 5*(2009): 9-24. Available at: https://lucris.lub.lu.se/ws/portalfiles/portal/5414075/1459003.pdf#page=12

Qiu, X., Kong H., Wang K., Zhang N., Park S., & Bu, N. (2023). Past, present, and future of tourism and climate change research: bibliometric analysis based on vosviewer and scimat. *Asia Pacific Journal of Tourism Research* 28(1): 36-55. Available at: https://www.tandfonline.com/doi/pdf/10.1080/10941665.2023.2187702?casa_token=y-NZzBP--vwAAAAA:qbyGrDybjJmzJ98h66LngmVZxkAynzkwWJ0ngtH2pGdGx-kiE3VsVpfrpt5v4A7BZTvQQg6crmaTfwI

Salazar-Concha, C., Ficapal-Cusí P., Boada-Grau J., & Camacho L. J. (2021). Analyzing the evolution of technostress: A science mapping approach. *Heliyon* 7(4), e06726. Available at: https://www.cell.com/heliyon/pdf/S2405-8440(21)00829-X.pdf

Small, H. 1999. Visualizing Science by Citation Mapping. Journal of the American Society for Information Science 50(9): 799– 813. Available at: https://www.researchgate.net/profile/Henry-Small-2/publication/220432711_Visualizing_Science_by_Citation_Mapping/links/5cf55c6c4585153c3db187ec/Visualizing-Science-by-Citation-Mapping.pdf

World Bank. 2013. China 2030: Building a Modern, Harmonious, and Creative Societ. World Bank Publications. (ABD 2013). Available at: https://documents1.worldbank.org/curated/en/781101468239669951/pdf/China-2030-building-a-modern-harmonious-and-creative-society.pdf