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CONTENTS

ARTICLE	PAGE
Joseph I. DAVID, Magashi J. NTEGWA Enhancing Procurement Integrity: Key Factors Influencing Internal Audit Effectiveness in Tanzania Public Procurement Research Article	1 – 14
Merve GERÇEK, Cem Güney ÖZVEREN How Do Proactive Personality and Internal Locus of Control Play a Role in the Links Between Career Adaptability and Job Search Behaviors of Job Seekers? A Two-Moderator Approach Research Article	15 – 31
Mohammad Mohidul ISLAM Impacts of Monetary and Fiscal Policies on Price and Currency Stability in Bangladesh Research Article	32 – 47
İbrahim ÖZMEN, Selçuk BALI Pollution Haven Hypothesis: Smooth Quantile Evidence from BRICS Research Article	48 – 58
İbrahim ÇIDEM, Reşid ÇIĞDEM Social Network Use of Accounting Professionals in Accessing Professional Knowledge in Türkiye: The Case of Facebook Research Article	59 – 68

Enhancing Procurement Integrity: Key Factors Influencing Internal Audit Effectiveness in Tanzania Public Procurement

Tanzanya Kamu Alımlarında İç Denetim Etkinliğini Artıran Temel Faktörler: Satın Alma Bütünlüğünün Güçlendirilmesi

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ABSTRACT

This paper analyses the effects of internal audit competence, independence, and procedures on internal audit effectiveness in the procurement process in the public sector of Tanzania. The study is quantitative, and data were collected through questionnaires from accounting officers, senior management officers, audit committees, and internal audit units in public sectors. A total of 318 responses were collected. A Partial Least Structural Equation Modelling (PLS-SEM) technique was applied using R-studio to analyse the collected data, assess the model and test hypotheses. The findings revealed that internal audit characteristics procedures, independence and competence influence internal audit effectiveness in procurement. The study findings provide useful insights for policymakers, academics, and internal audit practitioners on the effect of the characteristics of internal audits in improving the effectiveness of internal audits in procurement in Tanzania.

ÖZET

Anahtar Kelimeler:

Satın Alma,
İç Denetim,
Tanzanya,
Verimlilik

Jel Kodları:

H57 M42 M48

Bu makale, Tanzanya'nın kamu sektöründe iç denetim yeterliliği, bağımsızlık ve prosedürlerinin iç denetim etkinliği üzerindeki etkilerini analiz etmektedir. Çalışma, nicel bir yaklaşımla yürütülmüş olup veriler, kamu sektöründeki muhasebe görevlileri, üst düzey yöneticiler, denetim komiteleri ve iç denetim birimlerinden oluşan çalışanlardan anketler aracılığıyla veriler toplanmıştır. Toplamda 318 yanıt toplanmıştır. Toplanan verileri analiz etmek, modeli değerlendirmek ve hipotezleri test etmek için R-studio kullanılarak Kısmi En Küçük Kareler Yapısal Eşitlik Modellemesi (PLS-SEM) yöntemi uygulanmıştır. Bulgular, iç denetim özelliklerinin prosedürlerinin, bağımsızlığının ve yeterliliğinin iç denetim etkinliğini satın almada etkilediğini ortaya koymuştur. Çalışma bulguları, Tanzanya'da iç denetimlerin özelliklerinin etkisi iç denetimlerin etkinliğini artırılması hakkında politika yapıcılar, akademisyenler ve iç denetim uygulayıcıları için faydalı bilgiler sunmaktadır.

1. INTRODUCTION

The paper analyses the effects of internal audit characteristics (i.e. competence, procedure, and independence) on internal audit effectiveness in the procurement process in Tanzania's public sector. Procurement is a major expenditure financed by public funds in the public sector (IIA, 2021a). This is dominant in most of the government's activities. This is because of the value attached to facilitate and enhance government performance and service delivery to people (Cherotich et al., 2019). Furthermore, the attainment of the country's political, economic, and social objectives is contingent upon strong procurement management (Kihamba & Ntegwa, 2022). An internal audit can offer reassurance regarding an organization's effectiveness in implementing efficient practices to acquire goods, work and services through its plans and programmes (IIA, 2021a). Internal audits have evolved from the traditional role of monitoring internal control and financial compliance to a crucial internal consultancy in firms' risk management function, which is significant in corporate governance, fraud detection, risk assessment, and compliance audits (Alzeban & Gwilliam, 2014; Cohen & Sayag, 2010; Dellai & Omri, 2016; Samagaio & Felício, 2023).

Approximately 70% of the Tanzanian government's expenditure is subjected to procurement but 20% of this expenditure succumbs to clutches of corruption (Kihamba & Ntegwa, 2022). A study revealed that in Tanzania public sector procurement performance faces challenges such as weak internal control, lack of staff capacity, and lack of integrity (Matto, 2017). Moreover, the internal auditing function faces challenges due to limitations in its structure deficiencies in staffing, inadequate funding, and a lack of necessary working facilities (Tulli, 2016). In line with this internal audit units suffer from a lack of government support, resulting in limited staffing, insufficient funding for fulfilling their responsibilities, and lack of independence (Shishiwa & Said, 2020).

It is critical to have a well-established, effective, and independent Internal Audit Unit in place to limit the detrimental impact of malpractice on organizational performance (Mihret et al., 2010). As a result, it is critical to understand the aspects that contribute to internal audit effectiveness in the Tanzanian procurement process. These factors are crucial in ensuring transparency, accountability, and efficiency in procurement activities. The main objective of the study is to examine factors that influence the effectiveness of internal auditing in procurement in Tanzania's public sector. Specifically, the study assesses the internal auditing competence, procedures and independence that influence the effectiveness of procurement activities in the public sector.

The present study contributes to the existing body of knowledge on internal audit characteristics and effectiveness in procurement (Cohen & Sayag, 2010; David, 2022). This study uses cross-sectional data from accounting officers, senior management officers, audit committees, and internal audit units in public sectors in Tanzania (LGAs and MDAs). While previous studies have focused on the influence of different factors on internal audit effectiveness in Tanzania, this study applies a rigorous econometric method of PLS-SEM, which can estimate path coefficients in structural models and model latent constructs even in the presence of non-normality, is ideal for small to medium sample sizes. Additionally, it can be used to understand the complex relationship between internal audit competence, independence, procedures, and effectiveness in the procurement process. The study findings may be useful in addressing malpractices, fraud and corruption which threaten public sector procurement in Tanzania.

The remainder of this paper is organized as follows: The subsequent section provides a review of the literature on internal audit competence, procedure, independence, and effectiveness. Subsequently, the methods, results, and discussion are presented. The paper concludes by presenting findings, contributions, limitations, and suggestions for future research.

2. LITERATURE REVIEW

2.1. Theoretical Literature Review

In previous studies, various theories have been used to investigate the effectiveness of internal audits. The Resource Based Theory (Alkebsi & Aziz, 2017; Alqudah et al., 2019), Transaction Cost Theory (Endaya & Hanefah, 2013), Resource Dependency Theory (Dittenhofer, 2001), Institutional Theory (Endaya & Hanefah, 2013; Karikari et al., 2022), Stewardship Theory (David, 2022), and others are some of these. However, researchers have not agreed on a single theory that explains the effectiveness of internal audits (Endaya & Hanefah, 2013).

The study at hand employs Stewardship Theory and Contingency Theory to explain the effectiveness of internal audits in the procurement process in the Tanzanian public sector. Stewardship Theory seeks to reconcile economic

approaches such as agency theory, which assumes self-serving individuals, with sociological and psychological perspectives that depict individuals as trustworthy and collectivist (Davis et al., 1997). The theory states that individuals within an organization act responsibly and, in the organization's, and its stakeholders' best interests. When it comes to internal audits, the assumption under this theory is that competent auditors possess the necessary skills to perform successful audits, ensure effective resource utilization and safeguard an organization's integrity. Stewardship Theory also emphasizes rigorous and systematic audit procedures aligned with the organization's objectives and values, which provides valuable insights for enhancing the procurement process and overall organizational performance. This theory underscores the significance of independent auditors who act objectively, reducing the influence of management or stakeholders, thus enhancing the credibility and effectiveness of the audit function. Overall, the Stewardship Theory highlights how responsible individuals can promote organizational success and ensure ethical and efficient internal audit practices.

Contrarily, the Contingency Theory postulates that both internal and external factors have an impact on how effectively an organization is managed and led, hence no single standard is sufficient (Fiedler, 1964; Meyer & Rowan, 1977). Internal audits and public procurement are affected by both internal and external factors (Feng, 2022; Gideon, 2015). The Contingency Theory is suitable for understanding how specific factors in the Tanzanian context may influence the effectiveness of internal audits in the procurement process. This theory suggests that there is no one-size-fits-all approach to organizational practices, and the effectiveness of internal audit procedures may depend on the unique characteristics of the procurement environment in Tanzania. Contingency Theory analyses how the regulatory environment, cultural norms, and organizational structure in Tanzania interact with internal audit procedures. This analysis provides insights into how certain audit approaches may be more suitable for a particular type of procurement practice within Tanzania.

2.2. Empirical Literature Review

2.2.1. Internal Audit Effectiveness

Internal audits play a vital role in organizations, encompassing elements such as planning, fieldwork, reporting, and interpersonal relations, which collectively contribute to their effectiveness (Yusof et al., 2019). It is significantly important to both the business sector (Drogalas et al., 2015; Ta & Doan, 2022) and the public sector (David, 2019, 2022), extending its influence to public and private organizations alike (Cohen & Sayag, 2010). By adopting a systematic approach, internal audit enables organizations to assess and enhance the efficiency of their risk management procedures, control processes, and corporate governance, thereby helping to speed up the achievement of organizational objectives (Dellai & Omri, 2016). Internal audit is intended to improve organizational effectiveness and efficiency through constructive criticism, and its role is to drive continuous improvement (Cohen & Sayag, 2010).

Effectiveness is also defined as “the degree (including quality) to which established objectives are achieved” by the Institute of Internal Auditors (IIA) (IIA, 2010). Organizations that perform internal audits are better able to recognize business risks, address system inefficiencies, and promote continuous development, but to retain the internal audit function's credibility, it is crucial to monitor the efficacy and efficiency (IIA, 2021b). The efficacy of internal audit adds value to organizations by ensuring compliance with established procedures, laws, and regulations which also offer opportunities to enhance existing processes (Yee et al., 2008). Important factors influencing internal audit effectiveness in the public sector include management support, audit experience and auditor's knowledge of the business (competence), and audit being free from all sorts of pressure (independence) (David, 2022; Drogalas et al., 2015).

2.2.2. Internal Audit Independence

As emphasised in the International Standards for the Professional Practice (ISPPIA, Standard 1100), internal audit effectiveness is significantly influenced by the independence of internal audit functions (Alzeban & Gwilliam, 2014). According to the ISPPIA, independence is the state of not being subject to any conditions that would make it difficult for the internal audit activity to carry out its duties as required. It is characterized by internal auditors being able to perform their duties objectively and impartially (Stewart & Subramaniam, 2010). The independence of the internal audit unit has a favourable and considerable impact on the overall level of internal audit competency in the Malaysian public sector (Yusof et al., 2019). Additionally, internal audit effectiveness is positively impacted by both internal audit independence and management support for internal audit (Cohen & Sayag, 2010; Ta & Doan, 2022), with internal audit effectiveness in the Malaysian context notably influencing internal audit independence (Tahajuddin & Kertali, 2018). In a similar vein, a study on the elements influencing internal audit effectiveness in Tunisian organisations finds that internal audit independence, internal auditor objectivity, and management support for internal audits play critical roles (Dellai & Omri, 2016). Additionally, it's important to

keep in mind that a lack of internal audit independence makes it difficult to achieve adequate internal audit performance because it results in ineffective organisational performance (Alzeban & Gwilliam, 2014). Consequently, the following is our first hypothesis:

H₁: Internal audit independence positively affects internal audit effectiveness in the procurement process.

2.2.3. Internal Audit Competence

The competence of internal audit staff is crucial for the effectiveness of internal audit activities (Alzeban & Gwilliam, 2014). Internal auditors and internal audit activities must meet the requirements of the International Standards for the Professional Practice of Internal Auditing (ISPPA, Standard 1210) by possessing the necessary knowledge, skills, and competencies. Internal auditors must therefore possess the necessary education, professional credentials, experience, and training (Mihret et al., 2010). A competent internal audit function aims to ensure effective internal controls, contributing to the growth of the economy and the progress of public organizations. Public entities lacking competent internal audit units face significant challenges in achieving their objectives, including economic development and national growth. This highlights the increasing need for competent internal audit functions, particularly in the Tanzanian public sector, with a specific focus on public procurement. Studies stress the significance of internal auditor competency in determining internal audit effectiveness (David, 2019, 2022; Grima et al., 2023). It is important to note that some study findings indicate that the efficiency of an internal audit programme may be restricted by the competency of internal auditors and the calibre of their work (Cohen & Sayag, 2010; Ta & Doan, 2022). Internal audit competencies facilitate the internal audit function to provide relevant and reliable information on public procurement (David, 2022). Therefore, the following is our second hypothesis:

H₂: Internal audit competence positively influences internal audit effectiveness in procurement.

2.2.4. Internal Audit Procedures

Internal audit procedures on public sector procurement are those procedures and methods used by the auditors to obtain the necessary sufficient and appropriate audit evidence to give their assurance on controls in procurement assignments (David, 2019, 2022). For the audit in procurement to be effective, the procurement laws should be understood by auditors and procurement cycles should be at the fingertips of the auditors (URT, 2011). Performing an audit following internal audit standards affects the effectiveness of the internal audit (Cohen & Sayag, 2010; Dejnaronk et al., 2016; Mihret & Yismaw, 2007). To ensure compliance with procurement laws inside an organisation, the internal audit function must have a complete understanding of the procurement cycle.

The procurement cycle comprises essential processes for acquiring goods, services, or works and is a cyclical process. Members can use this interactive tool to be guided through every step of the procurement process and receive relevant information to help them make decisions. Planning for procurement, defining requirements, sourcing for tenders, assessment and selection, contract award, and contract administration are all included in the procurement cycle (URT, 2011). Following the recommended processes and procedures and adhering to procurement policies are essential for internal audits to prevent adverse audit outcomes. Moreover, the internal audit role needs to monitor procurement activities that law enforcement reveals and reports (URT, 2001, 2011). The auditor has to identify and resolve any disparities or abnormalities as soon as possible to guarantee an equitable and transparent procurement procedure (Etse & Asenso-Boakye, 2014).

Additionally, the internal audit procedures can positively influence internal audit competence through clarity and focus, compliance, and standards as well as access to information ensuring there are quality auditors who can execute their duties aligning with public sector regulation, procurement risk assessment, quality of procurement audits as well as preventing fraud and mismanagement. Thus, internal audit procedures ensure transparency, fairness, and compliance with regulations during the procurement process. As a result, our third hypothesis is as follows:

H₃: Internal audit procedures positively influence internal audit effectiveness in procurement.

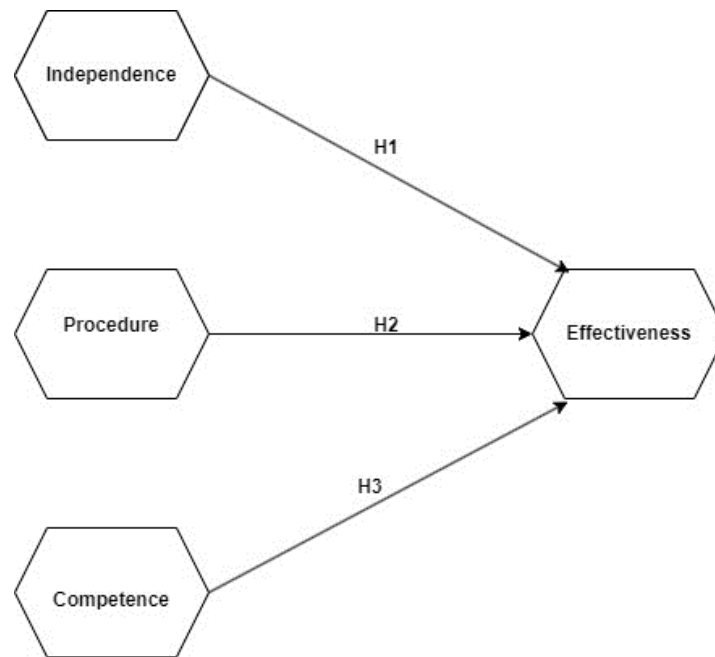


Figure 1. Research Model of the Research.

Unlike previous studies like (David, 2019, 2022) which used only the LGAs sample, the study at hand contributes to the existing body of knowledge on the effectiveness of internal audit effectiveness in procurement in public sectors by employing a representative sample from MDAs and LGAs. Additionally, the study uses a different methodology. Therefore, the study at hand makes an incremental innovation in academic contribution as it uses a different sample and rigorous methodology.

3. METHODOLOGY

3.1. Data and Sampling

This study's target consisted of audit department employees in Tanzania's public sector (LGAs and MDAs). From December 10, 2021, to January 3, 2022, self-administered questionnaires were distributed to public officials at Tanzania's Department of Internal Audit. The survey used a convenient sampling technique. 420 questionnaires were distributed in total and 318 of them were returned with complete information (76 per cent response rate) and were used for analysis. Of these valid responses, 241 were from LGAs and 77 were from MDAs. The sample included accounting officers, senior management officers, audit committees, and internal audit units as they were considered to be in the best position to provide appropriate responses on the accuracy of the financial statements and other relevant documents to the audit, including compliance with applicable laws and regulation (URT, 2023).

3.2. Research Instrument

The study included numerous items on a five-point Likert scale to measure the components under consideration. Multiple items, a five-point Likert scale was used in the study to measure the constructs being studied. To ensure the validity of the measurement, previously validated items were drawn from relevant previous studies. However, we conducted new validity and reliability tests since we modified the tool. All measurement items received scores ranging from 1 (strongly disagree) to 5 (strongly agree). Internal audit independence constructs were specifically tested using eight items from Alzeban & Gwilliam (2014) and Turetken et al (2019). The internal audit procedural construct was evaluated using eleven elements from the PPRA Performance and Score Sheet and the IIA Operations Manual. Internal audit competency was assessed using eight items adopted from Alzeban & Gwilliam (2014) Drogalas et al (2015) and Turetken et al (2019), while internal audit effectiveness was measured using four items adopted from Alzeban & Gwilliam (2014) and Cohen & Sayag (2010).

In the pre-test phase, specialists assessed the questionnaire before it was distributed to respondents. Then it was administered to some respondents in a pilot study to identify any necessary changes. Accommodations were made based on the feedback received during this pre-test phase. There were five sections in the final questionnaire. The first section was on the respondents' profiles such as their education level, years of experience in management,

professionalism and whether from LGAs or MDAs. The last four sections focused on internal audit competence, independence, procedure, and effectiveness.

Descriptive statistics for the internal audit effectiveness dimensions are shown in Table 1. The mean scores and standard deviations for each dimension were calculated. For instance, the mean score for "internal audit procedures" was 3.617, with a standard deviation of 0.805. Similar statistics were computed for "internal audit independence" (mean score=3.374, SD=0.775), "internal audit competence" (mean score=3.590 SD=0.767), and "internal audit effectiveness" (mean score=3.519, SD=0.912). It is worth mentioning that all the mean ratings obtained were greater than 3 on a 5-point Likert scale. This indicates the respondents' positive response and agreement on the items related to internal audit competence, independence, procedure, and effectiveness.

3.3. Analytical Methods

The PLS-SEM method was used to assess hypotheses based on structural equation modelling for this study. The R software was used for the analysis. PLS-SEM is a well-established technique that is widely used to estimate path coefficients in structural models. Even in the presence of non-normality, it can represent latent constructs and is appropriate for small to medium sample sizes. The loadings, weights, and path coefficients were found to have varying significance levels using the bootstrapping technique. Prior to exploring the structural relationships of the model, the measuring model's validity and goodness of fit were evaluated (Anderson & Gerbing, 1988).

The R-Studio software's PLS-SEM was used to analyse the data. The first section of the analysis concentrated on the evaluation of reflective measurement models. In this study, indicator reliability, internal consistency reliability, convergent validity (AVE) (see Table 3) and discriminant validity (Fornell-Larker and Heterotrait-Monotrait Ratio (HTMT) criteria) were assessed (see Tables 4 & 5). The structural model assessment (path coefficients) was the focus of the second section of the analysis. The initial sample size was bootstrapped using 1,000 resamples to create T-values and path coefficients (Table 7) to test the study's hypotheses. Collinearity, path coefficient, coefficient of determination (R-square), and effect size (f-square) are all used to evaluate the structural model.

Table 1. Descriptive Statistics

Constructs	No. of items	Mean score	SD
Competence	8	3.590	0.767
Procedure	11	3.617	0.805
Independence	8	3.374	0.775
Effectiveness	4	3.519	0.912

4. RESULTS

4.1. Respondent's Profile

The sample for this study included respondents from both Local Government Areas (LGAs) and Ministries, Departments, and Agencies (MDAs) (see Table 2). Seventy-six per cent (76%) of respondents in the sample were from LGAs and 24% were from MDAs. Respondent's profile indicated that 46% of the respondents held a bachelor's degree, 51% had a master's degree, and approximately 4% had a diploma in accountancy. Making informed decisions during the procurement process largely depends on the level of education. The study also recognized the significance of the profession in making informed decisions in procurement. In terms of specific qualifications, only 2.8% of the respondents had a diploma in accountancy. The majority (60%) of the respondents are Procurement/Accountant officers. Certified Public Accountants accounted for 21%, while Certified Procurement and Supplies Professionals comprised 8.8% of the respondents. Meanwhile, lawyers were 7.55% of all the respondents. Thus, the procurement process benefits from these diverse qualifications when making decisions. Additionally, Table 2 shows the respondents' experience in management roles. Approximately 26% of the respondents had 4-6 years of managerial experience, compared to 16% who had less than 3 years. Also, 22% of the respondents had 7 to 10 years of experience. Approximately, 6% and 2%, respectively had experience ranging from 21 to 30 and above 30. Over 50% of the participants had over 7 years of experience in managerial positions.

Table 2. Respondent's Characteristics

Variable	Items	(%)
Education level	Diploma in accountancy	3.46
	Bachelor's degree	45.91
	Master's degree	50.63
Years of experience	0-3 years	15.72
	4-6 years	25.79
	7-10 years	21.70
	11-20 years	28.62
	21-30 years	5.97
	Above 30 years	2.20
Profession	Diploma in Accountancy	2.83
	Procurement/Accountant officer	60.06
	Certified Public Accountant	20.75
	Certified Procurement and Supplies Professional	8.81
	Lawyer	7.55
Public sector	Local Government Authority (LGAs)	75.79
	Ministries, Departments and Agencies (MDAs)	24.21
Total		318

4.2. Evaluation of the Measurement Model

Validity and reliability are taken into account when assessing the quality of reflective measurement models computed by PLS-SEM. Evaluation of the measurement model considers assessing the indicator reliability, the internal consistency reliability, the convergent validity and the discriminant validity (Hair et al., 2021). It is recommended to eliminate elements with loadings below 0.40 from the model, which is what we did to make sure the indicators were reliable (Hair et al., 2021). We retained variables with loadings equal to or above 0.40, as removing them did not result in improved internal consistency reliability or convergent validity. It is worth noting that the scale used to measure these variables is a recently developed one, which justifies their retention in our model.

Table 3 reports item outer loadings, the composite reliability (ρ_c), Cronbach's alpha (CA), the reliability coefficient ($Rho-A$), and the average variance extracted (AVE). Each of the competencies, procedures, independence, and effectiveness indicator loadings of the reflectively measured construct is above 0.40 (Hair et al., 2019) indicating a sufficient level of indicator reliability. This suggests that the construct accounts for about 40% of the variation of the indicator, hence offering satisfactory indicator reliability in social science (Hulland, 1999).

The exact (or consistent) reliability coefficient (Rho-A), Cronbach's alpha, and composite reliability were used to evaluate the construct and the items' internal consistency reliability. The reliability coefficient for competence, independence, procedure, and effectiveness has all shown greater levels of internal consistency reliability, with respective scores of 0.863, 0.868, 0.933, and 0.859. According to Hair et al. (2019), all construct measures are deemed reliable if Cronbach's alpha (0.847 for competence, 0.929 for procedures, 0.845 for independence, and 0.851 for effectiveness) and the composite reliability (0.883 for competence, 0.940 for procedures, 0.882 for independence, and 0.900 for effectiveness) are higher than the 0.70 thresholds. Table 3's findings demonstrate that the elements satisfy the specified requirements and can be included in the model.

Convergent validity—the extent to which a construct converges to explain the variance of its indicators—was also assessed using average variance extracted (AVE), which is the mean of a construct indicator's squared loadings. The AVE is greater than 0.50, as indicated in Table 3. Given our sample's reliability and validity, this renders the model acceptable.

Table 3. Results of Construct Validity and Reliability Tests

Constructs	Items	Loadings	ρ_c	CA	Rho-A	AVE
Competence	C1	0.777	0.883	0.847	0.863	0.516
	C2	0.791				
	C3	0.795				
	C4	0.645				
	C5	0.724				
	C6	0.478				
	C7	0.678				
	C8	0.652				
Procedures	P1	0.632	0.940	0.929	0.933	0.590
	P2	0.659				
	P3	0.809				
	P4	0.811				
	P5	0.807				
	P6	0.844				
	P7	0.820				
	P8	0.806				
	P9	0.770				
	P10	0.775				
	P11	0.722				
Independence	I1	0.615	0.882	0.845	0.868	0.671
	I2	0.628				
	I3	0.648				
	I4	0.790				
	I5	0.857				
	I6	0.851				
	I7	0.429				
	I8	0.689				
Effectiveness	E1	0.859	0.900	0.851	0.859	0.693
	E2	0.896				
	E3	0.825				
	E4	0.743				

Notes: AVE=Average Variance Extracted; ρ_c =composite reliability; CA=Cronbach Alpha; Rho_A= reliability coefficient, See Appendix A1 for explanation of C1,C2,...C8, P1, P2,...,P11, I1, I2,...I8, E1, E2..., E4

4.2.1. Discriminant validity

Two criteria were employed to assess the discriminant validity of the components in this study: the Heterotrait-Monotrait Ratio (HTMT) of the correlations and the Fornell-Larcker criterion. According to the Fornell-Larcker criterion (Fornell & Larcker, 1981), each construct's square root of the average variance extracted (AVE) should exceed its highest correlation with any other construct in the model. Additionally, it is recommended that the HTMT values be below 0.90 for conceptually similar constructs and below 0.85 for different constructs (Hair et al., 2019, 2021). In the analysis based on the Fornell-Lacker criterion, it was observed that the square root value of each construct exceeded its correlations with other constructs. The results of both tests satisfied the recommended thresholds, hence indicating that all constructs in this study had an acceptable discriminant validity (Tables 4 and 5).

Table 4. Fornell-Larcker's Discriminant Validity Criterion

	Procedure	Independence	Competence	Effectiveness
Procedure	0.768			
Independence	0.709	0.819		
Competence	0.692	0.700	0.718	
Effectiveness	0.702	0.747	0.701	0.833

Notes: AVE's square root is represented by the diagonal values

Table 5. The Heterotrait-Monotrait Ratio (HTMT) of the correlations

	Procedure	Independence	Competence
Procedure	.	.	.
Independence	0.748	.	.
Competence	0.531	0.480	.
Effectiveness	0.786	0.808	0.496

Furthermore, we examined if the HTMT value deviated considerably from 0.85 (Henseler et al., 2015). The original HTMT values for each combination of constructs in the model are displayed in Table 6's column Original Est. Together with the average HTMT values estimated from 10,000 bootstrap samples, the original HTMT values are displayed in column Bootstrap Mean. Since every number in the 95% column is below the cutoffs, every HTMT result is substantially lower than 0.85 and 0.90, respectively.

Table 6. Bootstrap Confidence Intervals Test

	Original Est.	Bootstrap Mean	Bootstrap SD	T Stat.	5% CI	95% CI
Competence -> Independence	0.480	0.481	0.054	8.953	0.392	0.564
Competence -> Procedure	0.538	0.537	0.049	10.916	0.452	0.615
Competence -> Effectiveness	0.507	0.505	0.054	9.336	0.413	0.590
Independence -> Procedure	0.796	0.797	0.035	22.691	0.735	0.854
Independence -> Effectiveness	0.863	0.863	0.034	25.510	0.806	0.814
Procedure -> Effectiveness	0.786	0.786	0.044	17.751	0.708	0.854

4.3. Structural Model and Hypothesis Testing

We assess the validity and reliability of all constructs by evaluating the measurement model before analysing the structural model to determine the significance of the hypotheses. Initially, we examined the model's collinearity by examining each item's variance inflation factor (VIF). The VIF was 2.265 (Procedure), 2.057 (Independence), and 1.311 (Competence). Multicollinearity was not an issue because all the values were below the 5-point threshold.

The significance of the path coefficients was assessed using a bootstrapping method with 1,000 iterations based on t-values and confidence intervals. The results of the hypothesis testing are shown in detail in Table 7. All the hypotheses that were put forth to affect Internal Audit Effectiveness procurement are supported by the findings. Results supported the first hypothesis (*H1*), which postulated that internal audit independence positively affects internal audit effectiveness in the procurement process (*H1*: $\beta=0.493$, $t=7.954$). Additionally, the second hypothesis (*H2*) postulated that internal audit procedure positively affects internal audit effectiveness, and this postulation was supported by the results (*H2*: $\beta=0.300$, $t=4.382$). These results confirmed that internal audit procedures will lead to internal audit effectiveness. Similarly, the third hypothesis (*H3*) postulated that internal audit competence positively affects internal audit effectiveness, which was supported by results (*H3*: $\beta=0.100$, $t=2.894$). These results confirmed that internal audit competence will affect internal audit effectiveness in procurement.

Table 7. Hypothesis testing

	Original Est.	Bootstrap Mean	Bootstrap SD	T Stat.	5% CI	95% CI
Competence -> Effectiveness	0.100	0.102	0.034	2.894	0.046	0.159
Independence -> Effectiveness	0.493	0.490	0.062	7.954	0.392	0.594
Procedure -> Effectiveness	0.300	0.303	0.069	4.382	0.188	0.415

4.4. Model Explanatory Power

The endogenous construct's coefficient of determination (R^2 value) for effectiveness was 0.623, which is moderate and would be deemed acceptable in this context. Additionally, the f^2 effect size of the predictor shows the value

for all combinations of the corresponding exogenous (i.e. predictor) construct and the corresponding endogenous constructs (represented by columns). The results revealed that the internal audit procedure had a small effect size (0.106) on the effectiveness of internal audits in procurement. In contrast, independence exhibited a medium effect size (0.314) on the effectiveness of internal audits. Lastly, internal audit competence showed a small effect size (0.020) on the effectiveness of internal audits.

Table 8. Path Coefficient Estimates, R^2 , Adjusted R^2 Values, and F^2 Effect Sizes

	Effectiveness	f^2 (Effectiveness)
R^2	0.623	.
Adj R^2	0.619	.
Procedure	0.300	0.106 (medium)
Independence	0.493	0.314 (medium)
Competence	0.100	0.20 mall)

5. DISCUSSION

This study aimed to investigate the relationship between internal audit effectiveness and characteristics such as independence, competence, and procedures. Thus, the goal was to highlight the impact of internal audit independence, competencies, and procedures on internal audit effectiveness in Tanzania's public sector procurement. The construct was shown to be valid and reliable by the measurement model assessment, and the model itself was deemed acceptable.

The first hypothesis's results showed that internal audit independence and internal audit effectiveness in the procurement process are positively related. Internal audit independence and internal audit effectiveness in procurement by ensuring objectivity in the assessment, identification of risks and issues, credibility and trust, and alignment with professional standards. These results are consistent with results from previous studies (Alzeban & Gwilliam, 2014; Cohen & Sayag, 2010; David, 2022; Ta & Doan, 2022; Yusof et al., 2019). However, independence achieved partial confirmation of their positive influence (Grima et al., 2023). Independence and management support significantly result in improved procurement performance (Yusof et al., 2019). Additionally, the quality of the internal audit function is positively linked to the organizational independence of said function (Cohen & Sayag, 2010).

The findings for hypothesis 2 demonstrated that internal audit effectiveness in procurement is positively influenced by internal audit procedure. Thus, a well-designed internal audit procedure in procurement ensures the quality of the audit, alignment with organization objectives, compliance with standards and access to resources. This is in line with the previous study that found standard adherence to have a positive influence (Grima et al., 2023). However, other studies revealed non-compliance with International Standards on Auditing (ISA) and identified issues such as a lack of independence, outdated technology, and unfavourable attitudes among internal auditors (Shishiwa & Said, 2020).

The results for hypothesis 3 indicated that internal audit competence positively influences internal audit effectiveness in the procurement process. Competent auditors are better equipped to understand and evaluate procurement processes, identify risks, and provide valuable recommendations. Their skills and expertise contribute to the overall impact and value of the internal audit function in supporting improved procurement practices and governance. These results corroborate findings from previous studies (Cohen & Sayag, 2010; David, 2022; Grima et al., 2023). It is different from the study which revealed a non-significant positive relationship between competence and procurement performance (Yussuf et al., 2021).

6. CONCLUSION

The current study examined how internal audit effectiveness in the public procurement process is influenced by internal audit competence, procedures, and independence. Internal audit effectiveness in procurement is important in ensuring there is no malpractice and corruption with the public funds in the public sector in Tanzania. The results showed that competence, independence, and internal audit procedures all positively affect how effective internal audit procurement is in Tanzania's public sector. To ensure that internal audit functions are competent, independent, and have well-designed procedures, the government have to make sure that they are given the necessary resources. This is crucial, especially in a nation where a significant portion of public funds are allocated to the procurement of goods, works and services.

Even while the study at hand shed some light on the relationship between internal audit effectiveness and characteristics of public procurement in Tanzania, it was limited to the country's public sector. Thus, its findings cannot be generalized to the private sector in Tanzania. Comparable studies can be conducted in Tanzania's public and private sectors to obtain comparable and generalizable findings. Additionally, this study adopted only three internal audit characteristics (independence, competence, and procedure) in assessing internal audit effectiveness. Therefore, additional internal audit characteristics that could impact the effectiveness of internal audits in procurement might be examined in future studies. Thus, future studies can be carried out on support from management, the role of external audit in promoting value for money (VFM) in public procurement, and objectivity and its effect on internal audit effectiveness.

AUTHORS' DECLARATION

This paper complies with Research and Publication Ethics, has no conflict of interest to declare, and has received no financial support.

AUTHORS' CONTRIBUTIONS

Conceptualization, writing-original draft, editing – **JD** and **MN**, data collection, methodology, formal analysis – **JD** and **MN**, Final Approval and Accountability – **JD** and **MN**.

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APPENDIX

Appendix 1. Attributes of Variables Used

Internal Audit competencies on procurement assignments

- C1-Internal Auditors possess the qualifications necessary to carry out procurement audits.
- C2-Internal Auditors have the necessary experience to audit procurement assignments.
- C3-Internal Auditors have training on the Procurement Act
- C4-The number of Internal Audit Staff in the organization is adequate
- C5-At least every year Internal Auditors attend training on procurement Audit
- C6-Internal Audit Unit issues audit findings to management at least once in three months.
- C7-Staff attend on-the-job training at least twice a year
- C8-Internal Auditors trained in information technology

Internal Audit procedures on procurement assignments

- P1-Internal Auditors are knowledgeable about the Procurement cycle
- P2-Internal Audit Unit reviews the procurement plan as required by the professional body and PPRA
- P3-Internal Audit Unit reviews user department initiation of the procurement requirements
- P4-Internal Audit Unit reviews the composition of the Tender Board in the organization
- P5-Internal Audit reviews the involvement of the Tender Board on the contracts awarded
- P6-Internal Audit Unit evaluates decisions for the procurement method applied in the acquisition of the specific tender.
- P7-Internal Audit evaluates the work of the evaluation committee for submitted tenders
- P8-Internal Audit Unit reviews how the Evaluation criteria for submitted tenders were developed
- P9-Internal Audit Unit reviews communication of tender awards to suppliers/services providers who are about to win the said tenders
- P10-Internal Audit Unit reviews the conduct of negotiations with bidders before awarding tender
- P11-Internal Audit Unit reviews the formation of the contract management team

Independence of Internal Audit on Procurement assignments

- I1-Internal Auditors are sufficiently removed from political pressure in carrying on an audit assignment
- I2-Internal Audit Unit has free access to documents
- I3-Internal Audit Unit has free access to those charged with Governance
- I4-The council has an Internal Audit Charter
- I5-The Internal Audit charter has clearly defined the responsibilities of internal audit
- I6-The Internal Audit Charter has clearly defined authorities of the Internal Audit Unit
- I7-The Internal Audit unit has its sub-vote
- I8-The Internal Audit unit sub-vote is sufficiently funded

Effective Procurement Assignments

- E1-Organization comply with procurement legislation
 - E2- The organization minimize procurement costs
 - E3- The organization procure the required goods, works and services
 - E4- The organization timely acquire goods, work and services
-

How Do Proactive Personality and Internal Locus of Control Play a Role in the Links Between Career Adaptability and Job Search Behaviors of Job Seekers? A Two-Moderator Approach

Proaktif Kişilik ve İç Kontrol Odaklılık İş Arayanların Kariyer Uyumluluğu ve İş Arama Davranışları Arasındaki İlişkide Nasıl Bir Rol Oynar? İkili Moderatör Yaklaşımı

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ABSTRACT

Keywords:

Career Adaptability,
Job Search Behavior,
Proactive Personality,
Internal Locus of
Control

Jel Codes:

M10

The present labor market's rapid expansion has pressured individuals to enhance their employability and achieve professional success. Therefore, individuals need to be able to adapt and flourish in the face of unforeseen employment challenges, known as career adaptability. While previous studies have established the benefits of career adaptability in the job search process, there is a lack of understanding regarding the influence of personality characteristics on the relationship between career resources and job search behavior. This study investigates the combined moderating effects of proactive personality and internal locus of control on the link between career adaptability and job search behavior, drawing on career construction theory and planned job search behavior theory. The study sample comprises 308 individuals actively seeking employment in Istanbul and Kocaeli. SPSS AMOS was used for confirmatory factor analysis, and PROCESS Macro was used to examine moderator effects. The findings demonstrated a positive relationship between career adaptability, proactive personality, internal locus of control, and job-seeking behavior. Moreover, as predicted, the combined effect of proactive personality and internal locus of control moderates the relationship between career adaptability and job search behavior, suggesting the relationship is more robust when both traits are high. These findings are essential for researchers in the field of career and job search as well as for practitioners such as career counselors or training and development specialists.

ÖZET

Anahtar Kelimeler:

Kariyer Uyumluluğu,
İş Arama Davranışı,
Proaktif Kişilik
Özelliği,
İç Kontrol Odaklılık

Jel Kodları:

M10

Mevcut iş piyasalarının hızla genişlemesi, bireylere kendi istihdam edilebilirliklerini artırmaları ve mesleki başarı elde edebilmeleri için baskı oluşturmaktadır. Bu nedenle, bireylerin beklenmedik kariyer zorluklarına uyum sağlama ve gelişme kapasitesine sahip olmaları kritik öneme sahiptir. Daha önceki çalışmalar, iş arama sürecinde kariyer uyumluluğunun olumlu etkilerine ilişkin bulgulara yer vermiş olsa da kariyer uyumluluğu ve iş arayışı davranışları arasındaki ilişki üzerindeki kişilik özelliklerinin etkisi konusunda sınırlı sayıda çalışma bulunmaktadır. Bu çalışmada, Kariyer İnşası Kuramı ve Planlı İş Arama Davranışı Kuramına dayanarak, proaktif kişiliğin ve iç kontrol odaklılığın kariyer uyumluluğu ve iş arama davranışları arasındaki bağlantıda düzenleyici rollerinin incelenmesi amaçlanmıştır. Araştırmanın örneklemini İstanbul ve Kocaeli bölgelerinde aktif olarak iş arayan 308 kişi oluşturmaktadır. SPSS AMOS doğrulayıcı faktör analizi için ve PROCESS Macro düzenleyici etkilerin incelenmesi için kullanılmıştır. Elde edilen bulgular, kariyer uyumluluğu, proaktif kişilik, iç kontrol odaklılık ve iş arama davranışları arasında pozitif yönde ilişkiler bulunduğunu göstermektedir. Ayrıca, öngörüldüğü gibi, proaktif kişiliğin ve iç kontrol odaklılığın birlikte, kariyer uyumluluğu ve iş arama davranışları arasındaki ilişkiyi düzenlediği ve her iki özellik de yüksek olduğunda ilişkilerin daha güçlü olduğunu sonucuna ulaşılmıştır. Bu araştırmanın sonuçları kariyer ve iş arama alanındaki araştırmacılar ile kariyer danışmanları veya eğitim-geliştirme uzmanları gibi uygulayıcılar için önemlidir.

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1. INTRODUCTION

Job seekers in developing nations face numerous obstacles when navigating the complicated and competitive job search process in the constantly evolving labor markets. Seeking employment in these environments entails confronting challenging circumstances that can be exceedingly difficult, forcing individuals to have a considerable level of adaptability in order to obtain meaningful and sustainable employment opportunities. Unemployment is a stressful experience, and the majority of unemployed individuals actively seek new jobs. Nevertheless, not all endeavors related to searching for employment result in successful or fulfilling job placements. The significance of the employability of new market entrants has grown in response to the evolving labor market. According to some research findings, unemployment can seriously jeopardize people's financial and mental well-being and that of their families (Liu et al., 2014). Therefore, the consequences of unemployment exhibit a multifaceted and complicated nature. Employability, which is a combination of traits, behaviors, and social and human capital, is essential for success in the workplace (Clarke, 2018). Employability, encompassing factors such as career adaptability, is strongly correlated with favorable job search outcomes (Gerçek, 2023).

Thus, the need for highly competent and adaptable workers is increasing, highlighting the need to develop a diverse range of abilities that might go beyond specific job positions. As stated by Kristof (1996), when there is a discrepancy between the expectations of a job seeker and the qualifications needed for a particular position, it can lead to reduced job satisfaction, increased employee exhaustion, intentions to quit, and diminished productivity. Moreover, the negative outcomes of this discrepancy are similar to those experienced when losing a job and remaining unemployed, such as decreased life satisfaction and symptoms of depression (McKee-Ryan et al., 2009). Therefore, the job search process is a critical journey that has long-lasting effects on people even after obtaining a job.

The young population is at a distinct disadvantage since they struggle to understand the evolving requirements of employers and lack the experience of modern business values (ILO, 2022; Reay et al., 2006). In July 2022, the seasonally adjusted overall unemployment rate in Turkey was 10.1%, whereas the unemployment rate for the youth population was 19.1%. Furthermore, as per the data released by TÜİK in the previous year, it is worth mentioning that the average duration for a university graduate to find employment is 13.6 months (TÜİK, 2022). According to the data, the unemployment rate among young people is significantly high. Additionally, it indicates that university graduates face unemployment or have to engage in temporary employment for over a year after completing their studies (Kirazcı et al., 2023). These statistics indicate the significance of the job search process and the career adaptability of individuals.

Previous research indicates that the various strategies employed in job search have a significant influence on job search outcomes (Crossley & Highhouse, 2005). This includes the success of newcomers in finding employment, which in turn has meaningful implications for understanding an individual's long-term professional success (DiPrete & Eirich, 2006). Career adaptability is an essential characteristic for individuals looking for employment. It refers to the capacity to effectively navigate and adjust to changes in the work environment (Savickas, 2005). In a dynamic work environment characterized by changing job requirements and rapid industry shifts, the key to achieving success depends on one's ability to adapt, acquire new skills, and quickly embrace emerging opportunities. Additionally, certain individual factors are also important in the process of job search (Kanfer et al., 2001). Previous studies offer empirical support for the influence of personality traits on the process of seeking employment (Pan et al., 2018; van den Hee et al., 2020; Le & Lin, 2023). Individuals with a proactive personality are inclined to exhibit initiative and actively explore opportunities (Brown et al., 2006). A proactive mindset when it comes to job searching motivates individuals to look beyond conventional paths. Proactive personality traits help people utilize their connections to discover opportunities that are not widely recognized, and they are receptive to embracing change. Also, individuals who have an internal locus of control have the potential to perceive job transitions and changes as being within their sphere of influence.

The concept of locus of control pertains to an individual's personal evaluation of their level of control over the results of their life (Rotter, 1966). The locus of control is an important factor in assessing the ability of job seekers to impact the results of their job search while they are unemployed (McGee & McGee, 2016). Research indicates that the degree to which individuals believe they have control over their own lives influences the effectiveness of their job search efforts. Individuals with internal locus of control assume that their personal endeavors have a substantial influence on their prospects for employment (Madsen & Mikkelsen, 2022). Thus, a proactive personality and internal locus of control could strengthen the interdependent relationship between career adaptability and job search behaviors. These psychological traits may act as catalysts, influencing how individuals approach their career growth and handle the complexities of the job search process in developing countries. Although there have been previous studies examining the impact of personality traits on the relationship between

career adaptability and the job search process, there is limited knowledge regarding the collective influence of proactive personality and internal locus of control. This study seeks to investigate the multifaceted relationship between some personal characteristics. The combination of proactive personality, internal locus of control, and career adaptability may create a strong foundation for successful job search behaviors in the competitive work settings of developing countries. The results of this study may contribute to filling the gap in the career and job search literature and provide significant findings for career counselors and other professionals. Moreover, this research provides useful insights into how contextual variables may impact the impact of personal traits on job search behaviors by examining these associations. This research not only aims to contribute to academic knowledge but also provides practical insights that can directly benefit job seekers, and policymakers, particularly in the dynamically changing job markets of Istanbul and Kocaeli. In particular, the knowledge obtained from this study can help policymakers create more successful career counseling services and workforce readiness programs that are customized to the particular needs and characteristics of the local workforce in the quickly changing job markets of Istanbul and Kocaeli. This will help to create a more proactive and adaptive pool of job seekers who can successfully navigate the complexities of contemporary employment environments.

2. THEORETICAL BACKGROUND AND HYPOTHESIS DEVELOPMENT

2.1. Career Adaptability and Job Search Behavior

The origins of career adaptability can be traced back to the 1980s, when Super and Knasel introduced the concept of an individual's ability to effectively navigate and respond to the changing dynamics of work and working conditions. Career adaptability pertains to adjusting to new career-related circumstances with the meaning of *"a boundaryless mindset, planfulness, exploration, decision-making, information and realism, career planning, career exploration, and confidence"* (Savickas, 1997, 2002). Career adaptability was defined by Savickas (2005:51) as *"a psychosocial construct that denotes an individual's readiness and resources for coping with current and imminent occupational development tasks, occupational transitions, and personal traumas."* Career adaptability, a concept based on career construction theory (CCT), is pivotal in how individuals navigate career transitions and job search processes. CCT posits that career development is driven by one's adaptation to various transitions in life, such as moving from school to work or changing occupations, with the overarching goal of achieving person-environment integration. Based on CCT (Savickas & Porfeli, 2012), individuals who are willing to respond appropriately to career transitions will be motivated to engage in interpersonal and intrapersonal processes that help them adapt to the challenges. Hence, career adaptability is advantageous in understanding the process of job searching. It refers to the readiness and range of tools that help people deal with and prepare for changes in their careers in the job search process (Rottinghaus et al., 2012). In the context of Turkey, career adaptability has been associated with various concepts such as occupational anxiety (Gerçek, 2018), future work self (Çarkıt, 2022), and job satisfaction (Sökmen & Aydın, 2016). These findings highlight the multiple roles played by career adaptability, which not only helps individuals navigate changes in employment but also improves their job satisfaction. This suggests that interventions aimed at improving adaptability could have significant effects on both individual career achievements and organizational productivity in Turkey's dynamic job market.

There are several components to the individual job search process. One of them is job search self-efficacy, which refers to an individual's perceived level of competence in actively participating in the process of seeking employment (Ellis & Taylor, 1983). Traditionally, it has been believed that job searching precedes voluntary turnover or job choice behavior (Bretz et al., 1994). Although there are several descriptions of job search behavior, most acknowledge its multifaceted nature. Barber et al. (1994) define job search behavior as the systematic exploration of employment opportunities and the acquisition of detailed knowledge about specific career options. As Kanfer et al. (2001) stated, job search behavior is the result of a dynamic self-regulatory process that starts with the identification and dedication to a specific employment purpose, which triggers search behavior intended to achieve the intended purpose. The objective is to conclude the process of seeking employment and all associated endeavors and actions by either attaining or abandoning the goal of securing a job.

Job search behavior has been generally examined in Ajzen's Theory of Planned Behavior (TPB) (van Hooft et al., 2021). The theory of planned behavior explains how objectives and plans affect behavior (Ajzen, 1985). According to the TPB, a person's purpose to carry out a specific activity directly determines that person's behavior. In the context of a job search, for instance, particular intentions about the amount of effort one wants to put into finding a job should be able to predict the amount of effort one ultimately puts into the search. The premise is that a person's attitude toward the activity, subjective norm, and perception of control over the perceived difficulty of carrying out the conduct all have an impact on their intention to act. Within the context of a job search, an

unemployed person's cognitive or affective assessment of applying effort to their job search reflects their attitude toward the action. For example, one person can feel that making a solid effort to get a job is pointless, while another would think such an effort is beneficial (Song et al., 2006). The subjective norm is the degree to which unemployed people think their significant others expect them to put effort into finding employment (Van Ryn & Vinokur, 1992; Ajzen et al., 2018; van Hoof et al., 2021). The TPB argues that a person's job search attitude, subjective norm, and perceived behavioral control all play a significant role in determining their intention to search for a job (Ajzen, 2018). Previous studies have consistently shown that the TPB is a dependable indicator of job-seeking behavior (Caska, 1998).

Typically, the chances of finding a new job are higher when a person puts more effort into searching for employment (Wanberg et al., 2002). On the other hand, the level of effort put forth by job seekers in their job search and the strategies they use can affect their ability to find employment (McArdle et al., 2007). Individuals who have clear career objectives in the job search process adopt a more focused strategy. Exploration refers to the process of investigating various career options to gain knowledge about the preferred type of work (Savickas, 2005). The significance of exploration in career adaptability is apparent from its high priority in job research (Zikic & Hall, 2009). Most of the existing research on reemployment has focused on the level of effort put into job searching as a predictor of measurable unemployment outcomes, such as obtaining a job, receiving multiple job offers, and finding work within a specific timeframe. The effectiveness of job-search strategies will influence the quality of newly obtained employment. In the field of work and organizational psychology, the factors that are most frequently studied in relation to this are person-organization fit, job satisfaction, and turnover intentions. Prior research suggests that career adaptability is a determinant of job search strategy (Koen et al., 2010; Lim et al., 2019), job search outcomes (Guan et al., 2013), and job search success (Pan et al., 2018). Guan et al. (2013) found that career adaptability is a dependable measure of an individual's capacity to efficiently seek employment and their current employment status. Therefore, drawing from both theoretical and empirical evidence, we propose the following hypothesis:

H₁: Career adaptability has a positive effect on job search behavior.

2.2. The Moderator Role of Proactive Personality and Internal Locus of Control

Proactive personality refers to the tendency to take personal initiative in different situations and activities (Crant, 2000). Social Cognitive Theory (SCT), as defined by Bandura (1997), focuses on the belief in one's ability to utilize available resources rather than the possession of those resources (Bandura, 2007). Individuals who demonstrate initiative typically possess the belief that they are capable of achieving their goals. Proactive individuals actively seek opportunities, take the lead, take action, and persist until they achieve a resolution that ultimately brings about a conclusion (Bateman & Crant, 1993). Proactive personality is a significant trait that has been extensively studied about various aspects of behavior and career achievement. Also, Social Cognitive Theory (SCT) highlights the importance of individuals' beliefs in their ability to influence the outcomes of their lives (Lent et al., 2002). Research has shown that the proactive personality is particularly important in predicting innovative work behavior, job performance, and work engagement in various work settings (Bakker et al., 2012; Mubarak et al., 2021; Hu et al., 2021). Furthermore, empirical evidence has shown that it has a positive effect on both entrepreneurial ambitions and academic performance (Luo et al., 2022; Bilal et al., 2021). Additionally, it has been associated with proactive workplace practices and career self-efficacy (Kim & Park, 2017; Presbitero, 2015). Individuals' willingness to engage in adaptive behaviors is influenced by differences in personality (Teixeira et al., 2012). Consequently, there exists a correlation between personality traits and career adaptability. Previous research has demonstrated connections between various personality traits, such as optimism, self-esteem, proactive personality, and self-efficacy, and the Big Five personality traits are related to career adaptability (Van Vianen et al., 2012; Hui et al., 2018; Fang et al., 2018; Pan et al., 2018; Johnston, 2018). Also, prior research has shown that career adaptability plays a mediating role in the connection between employability and proactive personality. Proactive individuals are more inclined to develop adaptability in their careers, which in turn increases their chances of achieving success in the workplace (Yu et al., 2023). Individuals who have proactive personalities are more likely to engage in activities that can improve their ability to adapt (Cai et al., 2015). The proactive personality trait has an impact on the relationship between career adaptability and job search success, according to a study by Pan et al. (2019). Thus, we hypothesize:

H₂: Career adaptability is positively related to a proactive personality.

According to Rotter (1954), the idea of locus of control refers to a person's perception of the degree to which external factors like fate, luck, or the influence of influential people have an impact on their actions as well as internal factors like personal abilities and choices. An individual's perception of their ability to influence the

outcomes of events in their lives is referred to as their internal locus of control (Levenson, 1981). Individuals with a stronger internal locus of control believe that their actions have the ability to influence and control their circumstances. Individuals with a weaker internal locus of control are less inclined to perceive themselves as having control over their own fate (Rotter, 1966). Research on career achievement (Ng et al., 2006) suggests that individuals with a stronger internal locus of control are more inclined to actively explore and strategize ways to attain their career objectives. They also demonstrate greater determination and perseverance in overcoming obstacles that limit their career progress and show higher levels of motivation for continuous learning (Wang et al., 2010). Individuals with an internal locus of control are inclined to display a high degree of career adaptability. This is due to their confidence in their capacity to shape their own career paths and the desire to actively respond to evolving situations (Kim et al., 2018). The presence of an internal locus of control serves as a basis for the development of career adaptability skills. When individuals perceive that their actions can influence their career outcomes, they are more motivated to participate in continuous learning, actively pursue new opportunities, and demonstrate resilience in the face of obstacles. Thus, we hypothesize:

H₃: Career adaptability is positively related to internal locus of control.

Job search behavior encompasses not only the act of submitting applications for openly posted jobs but also engaging in networking activities and actively seeking information about the current state of the job market. Proactive individuals demonstrate a tendency to allocate time and energy towards establishing a network and remaining updated on job opportunities (Le et al., 2023). The process of job search can be characterized as dynamic and demanding, necessitating individuals to effectively cope with new circumstances. Individuals who are proactive are more inclined to perceive challenges as chances for personal development and adapt their strategies for job searching accordingly. Engaging in a job search needs persistent effort and intrinsic motivation. Academic research investigates proactive personality traits, such as initiative and persistence, to ascertain their impact on facilitating a smoother transition and improving job search outcomes for individuals (Zhu et al., 2021). Thus, we hypothesize:

H₄: Job search behavior is positively related to proactive personality.

Several studies in the literature have emphasized the notable impact of internal locus of control on career adaptability (Ningsih & Musoli, 2023; Kim & Lee, 2018; Safitri & Wibowo, 2021). According to social learning theorists such as Bandura (1997), individuals who possess an internal locus of control tend to perform more effectively in unfamiliar circumstances. Research has specifically investigated the locus of control as the main determinant of career adaptability (Duffy, 2010; Hirshi, 2009). Research in the field of career literature has shown that there is a positive correlation between having an internal locus of control and engaging in job search behavior (Caliendo et al., 2019; Caliendo et al., 2015; McGee, 2015; McGee & McGee, 2016). McGee (2015) conducted a study on the role of locus of control in job searching. The findings indicate that young unemployed males with an internal locus of control tend to set higher reservation salaries and engage in more comprehensive job searches (Cobb-Clark, 2015). Thus, we hypothesize:

H₅: Job search behavior is positively related to the internal locus of control.

Prospective job seekers face numerous challenges that require significant dedication and resources. These challenges include researching job opportunities, assessing personal capabilities, completing necessary documentation, participating in interviews, and ultimately choosing the most suitable position (Guan et al., 2013; Wanberg et al., 2010). Strong self-efficacy is likely an essential component in this process. Individuals who are proactive exhibit higher levels of self-efficacy, possess a greater orientation towards the future, and are more inclined to engage in actions that enhance their employability (Seibert et al., 1999; Tolentino et al., 2014). Proactive people are more likely to take the initiative, pursue difficult goals, and persevere in their endeavors as a result of their self-efficacy beliefs, all of which support their proactive approach to tasks and challenges. In a study by Kuang et al. (2011), the researchers investigated the relationship between proactive personality, self-efficacy, locus of control, and economic confidence in making career decisions. Those with high levels of self-confidence demonstrated a higher level of self-efficacy when it came to making decisions regarding their careers. The locus of control moderated this association, with the external locus of control predicting a more significant positive relationship compared to the internal locus of control, which predicted a less significant relationship. Examining the combined effect of proactive personality and internal locus of control within the CCT framework enables researchers to investigate how these personal traits affect the way individuals build and adjust their careers over time. Also, the proactive personality and internal locus of control can be seen as factors that affect the perceived behavioral control in the TPB framework (Cobb-Clark, 2015). Investigating these characteristics as

moderators aids in comprehending how they can either strengthen or weaken the connection between career adaptability and the inclination to participate in job search activities. Thus, we hypothesize:

H₆: *The combined effect of proactive personality and internal locus of control moderates the relationship between career adaptability and job search behavior, suggesting the relationship is stronger when both traits are high.*

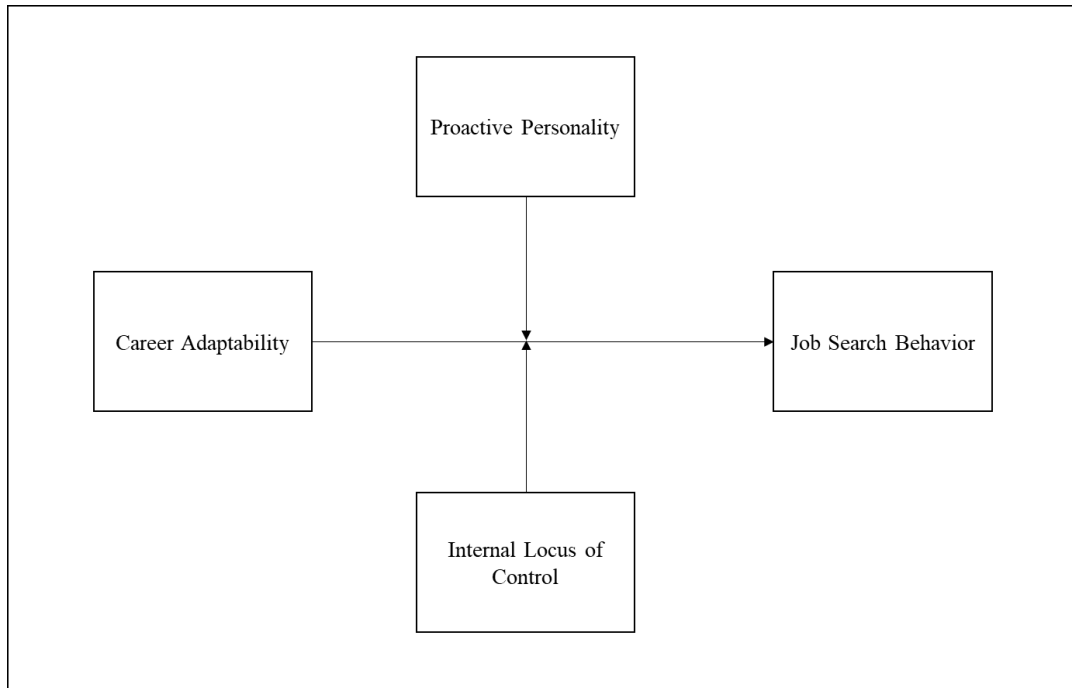


Figure 1. Conceptual Research Model

The conceptual research model (Figure 1) depicts the multifaceted connections of a proactive personality, internal locus of control, career adaptability, and job search behaviors in individuals seeking employment. The model suggests that a proactive personality and an internal locus of control play important roles in strengthening the positive influence of career adaptability on successful job search behaviors. This framework supports the idea that job seekers who have a high level of career adaptability, along with a proactive attitude and a strong belief in their ability to control their career outcomes, are more likely to use effective job search strategies. Consequently, they will be able to navigate the competitive job market easier and more successfully.

3. METHODOLOGY

3.1. Participants

The data were collected using the snowball sampling method, which involved convenience sampling through online survey forms. The snowball sampling method was selected to target and assess the job search behavior of current job seekers. Job-seeking participants were recruited through personal connections by distributing online survey forms. Ethical consent was received from each participant via online forms. The study sample consisted of a total of 308 job seekers who were located in Istanbul and Kocaeli. Istanbul and Kocaeli are major economic hubs with a rich blend of cultural and commercial activities in Turkey. Istanbul, being the largest city by population in Turkey, functions as a central center for finance, culture, and the economy, including many industries such as banking, tourism, media, and manufacturing. Also, Kocaeli is known for its substantial industrial foundation, namely in the automobile and petrochemical industries. The varied economic environment in these regions provides an extensive framework for examining job-seeking behaviors across various sectors and forms of employment. Additionally, both Istanbul and Kocaeli exhibit significant population densities and accommodate a demographically varied populace in terms of age, level of education, and socioeconomic status. Regarding gender, 170 participants (55.25%) were female, while 138 participants (44.8%) were male. The age distribution was as follows: 48.7% (n = 147) were between the ages of 18 and 20, 37.3% (n = 118) were between the ages of 21 and 23, and 14% (n = 43) were 24 years old or older. Additionally, 62 (20.1) of the participants were unemployed, while 246 (79.9%) of them were employed at the time.

3.2. Measures

All measurement tools were on a 5-point Likert scale (1=Completely disagree;5=Completely agree). Reliability and validity results are presented in the methods section.

Career Adaptability: The "Career Future Inventory" (CFI) developed by Rottinghaus et al. (2005) employed 11 items to assess career adaptability as a sub-dimension. A sample item is *"I can overcome potential barriers that may exist in my career."* A 5-point Likert scale, with options ranging from 1 ("strongly disagree") to 5 ("strongly agree"), was utilized. The original study reported a Cronbach's alpha coefficient of 0.85. In this study, Cronbach's alpha coefficient was 0.94.

Job Search Behavior: Job search behavior was measured with a 12-item "Job Search Behavior Scale" developed by Blau (1994). The participants indicated how they have done each of the items over the past six months, where 1 = never (0 times), 2 = rarely (1-2 times), 3 = occasionally (3-5 times), 4 = frequently (6-9 times), 5 = very frequently (at least 10 times). Example items are *"read a book or article about getting or changing jobs"*, and *"had a job interview with a prospective employer"*. The internal consistency value was 0.89 in the original study. In this study, Cronbach's alpha coefficient was 0.92.

Proactive Personality: Proactive personality was measured with a 10-item version (Seibert et al., 1999) of "Proactive Personality Scale" developed by Bateman and Crant (1993). A sample item is *"I am constantly on the look out for new ways to improve my life."* This scale consists of 10 items. The internal consistency value was 0.92 in prior studies (e.g. Major et al., 2006). In this study, Cronbach's alpha coefficient was 0.93.

Internal Locus of Control: Internal locus of control was measured with "Locus of Control" scale adapted by Mueller and Thomas (2001) from Rotter's work (1966) which comprises 10 items and includes both internal and external locus of control statements. A sample item is *"My life is determined by my own actions"*. The internal consistency was 0.81 in the original study. In this study, Cronbach's alpha coefficient was 0.80.

3.3. Analytical Procedure

Descriptive statistics were calculated via IBM SPSS. In order to check the validity and reliability of the study measures, alternative measurement models were developed, and confirmatory factor analysis (CFA) was assessed using SPSS AMOS. The standardized path coefficients and fit statistics are reported. A number of statistical fit indices are used to compare the fit of different measurement models. These include the χ^2 statistic, normed chi-square (χ^2/df), root mean square error of approximation (RMSEA), standardized root mean square residual (SRMR), and comparative fit index (CFI). Also, to test the moderator effects on the relationship between career adaptability and job search behavior, SPSS PROCESS Macro was used.

4. RESULTS

4.1. Descriptives

The descriptive statistics, such as means, standard deviations, bivariate correlations, internal consistency values (composite reliabilities), and average variance extracted (AVE) values of the measurement tools, are presented in Table 1. All of the correlations between the constructs were significant. According to the data presented in Table 1, there is a positive correlation between career adaptability and job search behavior ($r = 0.30, p < 0.01$), proactive personality ($r = 0.58, p < 0.01$), and internal locus of control ($r = 0.49; p < 0.01$). Job search behavior is positively correlated with proactive personality ($r = 0.16, p < 0.01$) and internal locus of control ($r = 0.15; p < 0.01$). Also, proactive personality was positively correlated with internal locus of control ($r = 0.68; p < 0.01$). The correlation results indicate that H2, H3, H4, and H5 are accepted. As seen in Table 1, the composite reliability values of the scales are 0.93, 0.80, 0.94, and 0.91, respectively. The average values of the scales are 0.58, 0.50, 0.63, and 0.52, respectively. According to Fornell and Larcker (1981), these values show that they are higher than the suggested threshold of 0.50.

Table 1. Descriptive Statistics and Correlations among PP, ILOC, CA, and JSB

Variables	Mean	SD	1	2	3	CR	AVE	Skewness	Kurtosis
1. PP: Proactive Personality	4,06	0.75				.93	.58	-1,66	1,60
2. ILOC: Internal Locus of Control	4,03	0.72	0.68**			.80	.50	-1,40	1,20
3. CA: Career Adaptability	4,13	0.73	0.58**	0.49**		.94	.63	-1,62	2,56
4. JSB: Job Search Behavior	2,74	0.97	0.16**	0.15**	0.30**	.91	.52	0,57	-0,50

Note. N= 308. CR: Composite Reliability, AVE: Average Variance Extracted
**p < .01

4.2. Validity Results

Initially, an exploratory factor analysis (EFA) was conducted using SPSS to determine the validity of the measurement tools. The results validated the expected scale constructs in accordance with the existing literature, with all factor loadings above 0.50: Career Adaptability (Total Variance Explained = 70.72%; KMO = 0.936; $p < 0.000$); Job Search Behavior (Total Variance Explained = 62.78%; KMO = 0.835; $p < 0.000$); Proactive Personality (Total Variance Explained = 62.40%; KMO = 0.933; $p < 0.000$); Internal Locus of Control (Total Variance Explained = 61.576%; KMO = 0.779; $p < 0.000$). Subsequently, as suggested by Bagozzi and Edwards (1998), different measurement models were tested using SPSS AMOS and the maximum likelihood approach through confirmatory factor analysis (CFA). This was done to see if the measurement tools used in the study were valid. Four separate confirmatory factor analyses (CFAs) were conducted to assess the distinctiveness of the study variables. The model fit was evaluated using the χ^2 statistic, normed chi-square (χ^2/df), RMSEA, SRMR, and CFI. RMSEA and SRMR values below 0.05 indicate a good fit, according to Browne and Cudeck (1992). On the other hand, CFI values of 0.90 or higher are considered acceptable.

Table 2. Fit Indices for the Alternative Measurement Models

Model	χ^2	df	χ^2/df	p	RMSEA	SRMR	CFI
1.Four-factor model	1049,238	515	2,037	0,000	0,06	0,05	0,93
2.Three-factor model	2052,927	518	3,963	0,000	0,10	0,13	0,79
3.Two-factor model	2143,301	520	4,122	0,000	0,10	0,14	0,78
4.One-factor model	3130,788	521	6,009	0,000	0,13	0,15	0,64

Note. N = 308. RMSEA root mean square error of approximation; SRMR= standardized root mean square residual; CFI= comparative fit index.

The four-factor model comprised proactive personality, internal locus of control, career adaptability, and job search behavior as distinct factors. As seen in Table 2, The statistical analysis yielded the following results: $\chi^2(1049,238) / df(515) = 2,037$, $p < 0.001$, RMSEA = 0,006; SRMR = 0,05; CFI = 0,93, indicating an acceptable model fit. The three-factor model included proactive personality and internal locus of control as a single factor, while career adaptability and job search behavior were taken as separate factors ($\chi^2(2052,927) / df(518) = 3,963$, $p < 0.001$, RMSEA = 0,010; SRMR = 0,13; CFI = 0,79). The two-factor model comprises proactive personality and internal locus of control collapsed into one factor, whereas career adaptability and job search behavior collapsed into one factor ($\chi^2(2143,301)/df(520) = 4,122$, $p < 0.001$, RMSEA = 0,010; SRMR = 0,14; CFI = 0,78). Finally, the one-factor model has collapsed all constructs into a single factor ($\chi^2(3130,788)/df(521) = 6,009$, $p < 0.001$, RMSEA = 0,013; SRMR = 0,15; CFI = 0,64). As a result, compared to the other models, the four-factor model yielded the most acceptable fit among all, indicating our measurement tools have acceptable validity.

4.3. The Moderator Test Results

In order to assess the combined moderator effect of proactive personality and internal locus of control on the relationship between career adaptability and job search behavior, SPSS PROCESS Macro was used. Model 2 by Hayes (2022) was chosen to test the dual moderation approach. Through the utilization of the SPSS Process Macro Hayes Model 2, we successfully incorporated both proactive personality and internal locus of control as moderators within a single analysis. The model subsequently calculated the interaction between these two moderators, enabling us to evaluate their combined influence on the relationship between career adaptability and job search behavior. As seen in Table 3, career adaptability has a significant and positive affect on job search behavior ($b = 0,55$; $p < 0,01$) with significant model statistics ($R^2 = 0,12$; $F = 8,5436$; $p < 0,001$). By taken separately, the interaction of career adaptability and proactive personality ($b = 0,11$; $p > 0,01$) and the interaction of career adaptability and internal locus of control ($b = 0,07$; $p > 0,01$) were statistically insignificant. However, the combined moderator roles of proactive personality and internal locus of control were statistically significant ($b = 0,03$; $p < 0,01$). Thus, H1 and H6 were supported.

Table 3. Moderator Role of Proactive Personality and Internal Locus of Control

Variable	<i>b</i>	SE	<i>t</i>	<i>p</i>	LLCI	ULCI		
Independent Variable (Job Search Behavior)								
Career Adaptability	0,5556	0,1002	5,5456	0,000	0,3585	0,7528		
Proactive Personality	-0,0324	0,1050	-0,3088	0,7577	-0,2392	0,1743		
Career Adaptability X Proactive Personality	0,1196	0,0880	1,3587	0,1752	-0,0536	0,2928		
Internal Locus of Control	0,0507	0,1021	0,4960	0,6202	-0,1503	0,2516		
Career Adaptability X Internal Locus of Control	0,0778	0,0931	0,8355	0,4041	-0,1055	0,2611		
Model Summary		R	R²	MSE	F	p		
		0,3520	0,1239	0,8533	8,5436	0,000		
Index of Moderation		R²Δ	F	df1	df2	p		
Career Adaptability X Proactive Personality		0,0054	1,8462	1,000	302	0,175		
Career Adaptability X Internal Locus of Control		0,0020	0,6981	1,000	302	0,404		
Career Adaptability X (Proactive Personality + Internal Locus of Control)		0,0326	5,6248	2,000	302	0,004		
Conditional Effects	PP	ILOC	<i>b</i>	SE	<i>t</i>	<i>p</i>	LLCI	ULCI
M-1SD (Low)	-0,7530	-0,7223	0,4094	0,0919	4,4550	0,0000	0,2286	0,5902
	-0,7530	0,0000	0,4656	0,1060	4,3926	0,0000	0,2570	0,6742
	-0,7530	0,7223	0,5218	0,1519	3,4349	0,0007	0,2229	0,8207
M (Average)	0,0000	-0,7223	0,4994	0,1193	4,1847	0,0000	0,2646	0,7343
	0,0000	0,0000	0,5556	0,1002	5,5456	0,0000	0,3585	0,7528
	0,0000	0,7223	0,6118	0,1220	5,0149	0,0000	0,3718	0,8519
M+1SD (High)	0,7530	-0,7223	0,5895	0,1698	3,4719	0,0006	0,2554	0,9236
	0,7530	0,0000	0,6457	0,1328	4,8633	0,0000	0,3844	0,9069
	0,7530	0,7223	0,7019	0,1244	5,617	0,0000	0,4571	0,9467

Notes. N=308, PP: Proactive Personality, ILOC: Internal Locus of Control

Figure 2 depicts a graph that shows how the combination of proactive personality and internal locus of control influences the relationship between career adaptability and job search behavior. The visual depiction indicates that the relationship becomes considerably more powerful when both proactive personality and internal locus of control are at increased levels, emphasizing the combined impact of these characteristics on job search behavior.

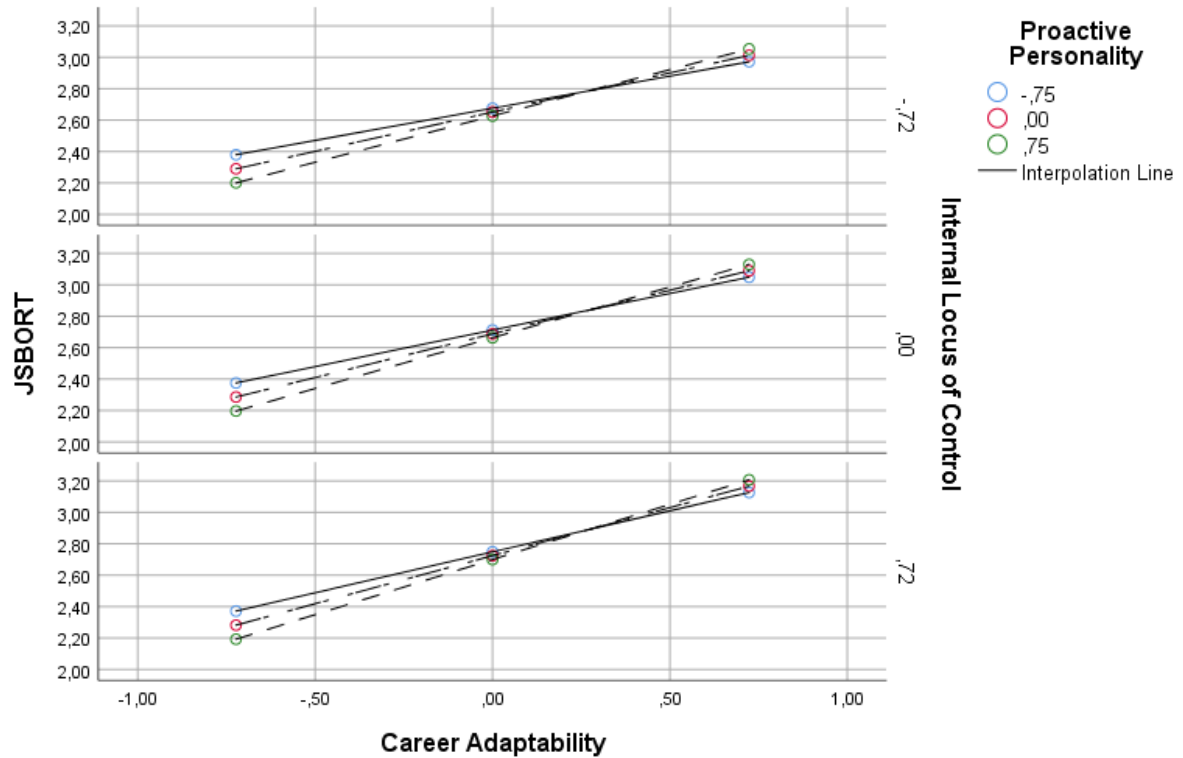


Figure 2. Visualization of the Moderator Role of Proactive Personality and Internal Locus of Control

5. CONCLUSION

As anticipated, this study yielded results parallel to prior studies by showing that career adaptability positively affects job search behavior (Pan et al., 2019; Tolentino et al., 2014). Most of the existing research on seeking employment has focused on the level of effort put into job searching as a predictor of measurable job search outcomes, such as successfully securing a job, receiving multiple job offers, and finding work within a specific timeframe. However, despite their efforts, these studies have been unable to accurately predict substantial differences in the level of job search quality, such as job satisfaction and the extent to which a new job aligns with an individual's requirements (Wanberg et al., 2002). The effectiveness of job-search strategies can significantly influence the quality of a recently obtained job. Also, individuals must invest a lot of time, effort, and energy into their job search to overcome several obstacles, including gathering information about jobs, evaluating their strengths and weaknesses, preparing the necessary paperwork, attending job interviews, and selecting the ideal position (Guan et al., 2013), personality traits play a key role in that process.

This study contributes to the career literature, especially to the CCT approach, by investigating the moderator role of proactive personality and internal locus of control. Although prior studies have taken proactive personality and internal locus of control into consideration separately, this study showed that those variables have a combined moderator role in the links between career adaptability and job search behavior. The findings indicate that the combined effect of proactive personality and internal locus of control moderates the relationship between career adaptability and job search behavior, suggesting the relationship is stronger when both traits are high. The evidence we provide corroborates the prior research findings, which posit that proactive personality is a significant boundary condition that impacts the intensity of the relationship between career competencies and job search behavior, ultimately affecting job search outcomes (Yu et al., 2023). In this context, highly proactive employees can initiate change and are driven by their internal motivation to develop resources that help them cope with challenges in their career development processes (Tolentino et al., 2014).

Our research supports the idea that having an internal locus of control positively impacts career-related outcomes. Individuals with a strong internal locus of control exhibited increased career adaptability and, as a result, reported increased career adaptability. This is consistent with social cognitive theory, which emphasizes the significance of individuals' beliefs in their capacity to affect the consequences of their lives (Lent et al., 2002). The presence of an internal locus of control indicates that individuals who believe they have more control over their life events are more likely to utilize career adaptability in the job search process.

This study also enhances the current body of knowledge by investigating the interaction among internal locus of control, career adaptability, and job search behavior. Results from practical research suggest that the internal locus of control affects the direction and strength of the association between job search behavior and career adaptability (van Hooft & Crossley, 2008). Our study revealed that individuals who possess a robust internal locus of control are more inclined to effectively apply their career adaptability by engaging in proactive job search behavior. Individuals' sense of personal control may contribute to the positive relationship between career adaptability and job search efforts.

Consequently, career counseling efforts focused on improving job seekers' career adaptability should involve developing their personal qualities and highlighting the practicality of adaptable job prospects (Hou et al., 2014). The practical implications can be categorized into individual and external factors. First and foremost, job seekers should conduct a comprehensive self-evaluation to gain insight into their proactive inclinations and locus of control. Identifying individual strengths and weaknesses can provide valuable insights for making informed choices in job search and career planning (van Hooft et al., 2021). They can also utilize proactive personality traits to broaden professional networks. Proactively pursuing networking opportunities, actively participating in informational interviews, and engaging in industry events could be advised. An extensive network can offer valuable perspectives, guidance, and potential employment opportunities. In the second category, both public and private sector entities could organize job fairs, networking events, and industry-specific expos to establish connections between individuals seeking employment and prospective employers. State-funded events can enhance chances for professional networking and employment placement. The results align with previous studies that highlight the significance of career adaptability in different aspects of the job search process. Earlier research, exemplified by the works of Koen et al. (2010), Lim et al. (2019), and Pan et al. (2018), has firmly established career adaptability as a pivotal factor influencing job search strategy, results, and overall career satisfaction. Moreover, Guan et al. (2013) emphasized the importance of career adaptability by illustrating its function as an accurate predictor of an individual's capacity to efficiently pursue employment and maintain their existing job position. Thus, the current study combines existing research with an exploration of how proactive personality and internal locus of control affect these dynamics. In this regard, organizations are advised to select employees with high levels of internal locus of control and to develop training programs to increase their employees' internal locus of control. Previous research reveals that employees with high levels of internal locus of control make more effective decisions (Rahmawati et al., 2023), and employees with more proactive personalities are more innovative (Ullah et al., 2023). In today's business world, where unexpected events emerge very quickly, it is necessary to react quickly to change. The competence to make fast and accurate decisions has become even more critical.

Although this study enhances our comprehension of the collective impacts of proactive personality and internal locus of control, it is important to recognize certain limitations. The study's reliance on self-report measures and its cross-sectional design limits its ability to establish causal relationships. To gain a more thorough understanding of these connections, future studies could utilize longitudinal methodologies and objective measures of career adaptability, job search behavior, proactive personality, and internal locus of control. Furthermore, it is worth considering other individual traits that may elucidate the relationship between career adaptability and job search behavior. Additionally, other job search outcomes that could be examined include the number of applications and successful interviews, among others.

This study provides valuable findings for career counselors, human resource professionals, educators, and job seekers, especially in developing countries where the employment market can be extremely competitive and demanding. This research highlights the significance of developing personal qualities such as proactive personality, internal locus of control, and career flexibility in individuals since they have a beneficial influence on job search success. Career counselors and educators may use these findings to customize their guidance and training programs. By doing this, organizations may improve the fit between employees' abilities and job requirements, aid in career development initiatives beyond the job search process, and increase the effectiveness of the organization as a whole. To shift demands in a dynamic global environment, organizations need a highly flexible workforce. Since supervisors assess employee performance, career adaptability, and compensation are closely related. Furthermore, it is advisable to emphasize the research implications for career counseling and career adaptability (Haibo et al., 2018). Organizations that make investments to help their employees become more career-adaptable experience higher employee engagement and retention rates. Organizational culture and training initiatives that support adaptability, learning, and development also facilitate employees in making more successful career transitions within an organization. This improves the organization's capacity to retain top personnel while improving employee satisfaction. Thus, HR professionals could improve recruiting methods and interventions that increase employee engagement and retention by comprehending the crucial role these attributes play in effective job search behaviors. In essence, this study not only enhances the theoretical foundation of career

Gerçek, M. & Özveren, C.G. – How Do Proactive Personality and Internal Locus of Control Play a Role in the Links Between Career Adaptability and Job Search Behaviors of Job Seekers? A Two-Moderator Approach
and job search literature but also offers practical implications for empowering individuals to deal with the challenges of the labor market more effectively.

AUTHORS' DECLARATION

This paper complies with Research and Publication Ethics, has no conflict of interest to declare, and has received no financial support.

AUTHORS' CONTRIBUTIONS

Conceptualization, writing-original draft, data collection, data analysis, editing – **MG**, data collection, data analysis, writing, editing – **CGÖ**, final approval, and accountability - **MG and CGÖ**.

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- Gerçek, M. & Özveren, C.G. – How Do Proactive Personality and Internal Locus of Control Play a Role in the Links Between Career Adaptability and Job Search Behaviors of Job Seekers? A Two-Moderator Approach
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Impacts of Monetary and Fiscal Policies on Price and Currency Stability in Bangladesh

Bangladeř'te Para ve Maliye Politikalarının Fiyat ve Döviz İstikrarı Üzerindeki Etkileri

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ABSTRACT

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Jel Codes:
C32 E31 E63 F31

This study investigates the effect of monetary and fiscal policies on inflation and exchange rate in Bangladesh in light of recent high inflation and the currency crisis. The analyses employ data from 1991 to 2022 to examine the ability of monetary and fiscal policies to stabilize the economy by managing inflation and currency fluctuations. The ARDL bounds test approach is utilized to estimate the empirical relationships of the model specification from both monetarist and Keynesian perspectives. The study's findings reveal that monetary and fiscal policies significantly impact inflation management, with monetary policy playing a more substantial role. The empirical relationship emphasizes that an increase in money supply and government spending positively affect inflation, with money supply having a greater impact on controlling domestic prices. Nevertheless, the study does not provide evidence that monetary and fiscal policies significantly influence exchange rate stabilization. The research indicates that enhancing the export sector, raising the amount of remittance inflows, reducing import reliance by promoting domestic production, prioritizing the reduction of fiscal reliance on monetary policy, and implementing a market-oriented exchange rate mechanism can aid in maintaining economic stability in terms of prices and currency. These outcomes provide valuable insight into the effectiveness of monetary and fiscal policies in stabilizing the economy and offer relevant policy implications for policymakers in Bangladesh.

ÖZET

Anahtar Kelimeler:
Para Arzı,
Devlet Harcamaları,
Enflasyon,
Döviz Kuru,
Bangladeř
Jel Kodları:
C32 E31 E63 F31

Bu çalışma, Bangladeř'te son dönemde yaşanan yüksek enflasyon ve döviz krizi ışığında para ve maliye politikalarının enflasyon ve döviz kuru üzerindeki etkisini incelemektedir. Analizlerde, para ve maliye politikalarının enflasyonu ve döviz dalgalanmalarını yöneterek ekonomiyi istikrara kavuşturma yeteneğini incelemek için 1991'den 2022'ye kadar olan verilerinden yararlanılmıştır. ARDL sınır testi yaklaşımı, model spesifikasyonunun ampirik ilişkilerini hem parasalcı hem de Keynesyen perspektiflerden tahmin etmek için kullanılmıştır. Çalışmanın bulguları, para ve maliye politikalarının enflasyon yönetimini önemli ölçüde etkilediğini, para politikasının ise daha önemli bir rol oynadığını ortaya koymaktadır. Ampirik ilişki, para arzındaki ve hükümet harcamalarındaki artışın enflasyonu olumlu yönde etkilediğini, para arzının yurt içi fiyatları kontrol etmede daha büyük bir etkiye sahip olduğunu vurgulamaktadır. Ancak çalışma para ve maliye politikalarının döviz kuru istikrarını önemli ölçüde etkilediğine dair kanıt sunmuyor. Araştırma, ihracat sektörünün güçlendirilmesi, işçi döviz girişi miktarının artırılması, yerli üretimi teşvik ederek ithalata bağımlılığın azaltılması, para politikasına mali bağımlılığın azaltılmasına öncelik verilmesi ve piyasa odaklı bir döviz kuru mekanizması uygulanmasının ekonomik istikrarın korunmasına yardımcı olabileceğini gösteriyor. Fiyatlar ve para birimi açısından bu sonuçlar, ekonomiyi istikrara kavuşturmada para ve maliye politikalarının etkinliğine dair değerli bilgiler sağlıyor ve Bangladeř'teki politika yapıcılara ilgili politika sonuçları sunuyor.

1. INTRODUCTION

Macroeconomic stability is essential for every country's long-term economic prosperity. Macroeconomic policies, such as fiscal and monetary policy, can help to stabilize the economy during times of crisis, such as currency crises and excessive inflation (Criste & Lupu, 2014; Blanchard & Summers, 2017; Fabris, 2018; Bonam & Lukkezen, 2019). During a crisis, most economies worldwide attempt to alleviate the situation by injecting additional liquidity and lowering interest rates (Brunnermeier, 2009; Cukierman, 2013). The flexibility with which policy interventions are implemented during a crisis depends on the level of monetary policy adoption (Laidler, 2017; Ullao-Suarez, 2023). Many central banks in developing countries aim to maintain low inflation, stable pricing, and long-term production growth (Iddrisu & Alagidede, 2020; Ahiadorme, 2022; Junior et al., 2022). The fiscal authority aims to achieve economic growth using all available budgetary measures (Wang et al., 2023). However, lowering the interest rate through monetary policy occasionally has the potential to undermine the country's currency, and because of the low-interest rate, there is a chance that capital outflow may occur (Cheung et al., 2016; Filardo et al., 2016; Han & Wei, 2018; Tobal & Menna, 2020). In this context, fiscal policy can be employed to control prices and steady economic growth. Because monetary policy is a collection of different policy tools for controlling money inventories to maintain macroeconomic stability, exemplary policy implementation can reasonably limit inflation (Sui et al., 2022; Sleibi et al., 2023). Furthermore, such monetary policy can preserve a healthy balance of payments condition, while well-functioning financial intermediation can support long-term financial and economic development (Sun & Liu, 2023).

During an economic slowdown, on the other hand, fiscal stimulus packages can significantly stimulate domestic demand and keep economic operations on track, restoring economic confidence (Deb et al., 2021). Meanwhile, inappropriate fiscal spending may result in a severe budget deficit that unnecessarily increases the public debt, resulting in a fiscal imbalance (Meier et al., 2021). Any failure to implement policies or poor reactions to policies may cause the economy to suffer for a long time rather than alleviate the crisis. When policy solutions are not sustainable, and the crisis becomes severe rather than being overcome, the economy may suffer greatly, and the recession may be prolonged (Hommes et al., 2018). The ability of fiscal and monetary policy to recover from economic crises such as currency crises and high inflation, as well as the superiority of fiscal or monetary policy in determining which is more proactive in times of economic turmoil, has become a contentious issue (Afonso et al., 2016; Wang et al., 2022; Lemoine & Linde, 2023). It has also been the subject of a long debate, which has yet to be resolved in the research community. Expert groups have opposing views; some argue monetary policy can resolve economic crises and present empirical evidence using a theoretical equation (Ferrando et al., 2022). Other expert groups, on the other hand, argue that fiscal efforts are more effective at resolving economic crises (Woodford & Xie, 2021). Therefore, the question is which is more effective for stabilizing the economy during a crisis: monetary or fiscal policy.

According to Keynesian thoughts, expansionary fiscal policy could be appropriate for firing up aggregate demand with growing output levels due to its greater multiplier effects in crisis mitigation (Keynes, 1936). Monetarists argue that monetary policy should be more aggressive in the short run to stimulate economic agents' behavior to recover from the economic slump (Friedman & Meiselman, 1963; Anderson & Jordan, 1968; Carlson, 1978). They believe that boosting the money stock will positively affect output mobilization. Nevertheless, there is no clear answer as to whether monetary or fiscal policy suits this context (Cavalli et al., 2019; Kocherlakota, 2022). The respective economies should be decided based on the pattern of crises, yet they must have sufficient understanding and forecasting power on the nature of crises to which policies may respond adequately. Furthermore, many studies solely look at the individual function of fiscal or monetary policy in defending the economy during a crisis (Eijffinger & Karatas, 2012). In practice, the combination or proper coordination of these policies, i.e., a set of comprehensive policy mixes, has rarely been identified as how the economy will prepare for future crisis situations by evaluating the past. In developing countries, monetary policy has always been influenced by fiscal counterparts to manage deficit financing, resulting in high inflationary consequences, while the principal mandate of monetary authority has been directly violated to control inflationary pressures (Bianchi & Ilut, 2017; Hur & Lee, 2017; Buyukbasaran et al., 2020; Skott, 2021; Algozhina, 2022). However, the fiscal authorities could also implement policies to mitigate the high inflationary repercussions of efficient fiscal budget control, such as boosting tax income. They must reduce fiscal reliance on monetary policy to fund the budget deficit (Aslanli, 2015; Cabral & Diaz, 2015; Neaime & Gaysset, 2022).

In Bangladesh, the inflation rate reflects a sharp rise or fall in the price of a standard consumer goods and services basket. At the beginning of the new millennium, Bangladesh's economy suffered from a gradual price increase, and then the situation improved, but in recent years, the inflationary pressure has been increasing. Sometimes, increasing food and oil prices in the world market significantly stimulates domestic inflation, limiting developing

or emerging market demand situations. Again, to some extent, market intermediaries charge higher prices, contributing to inflation.

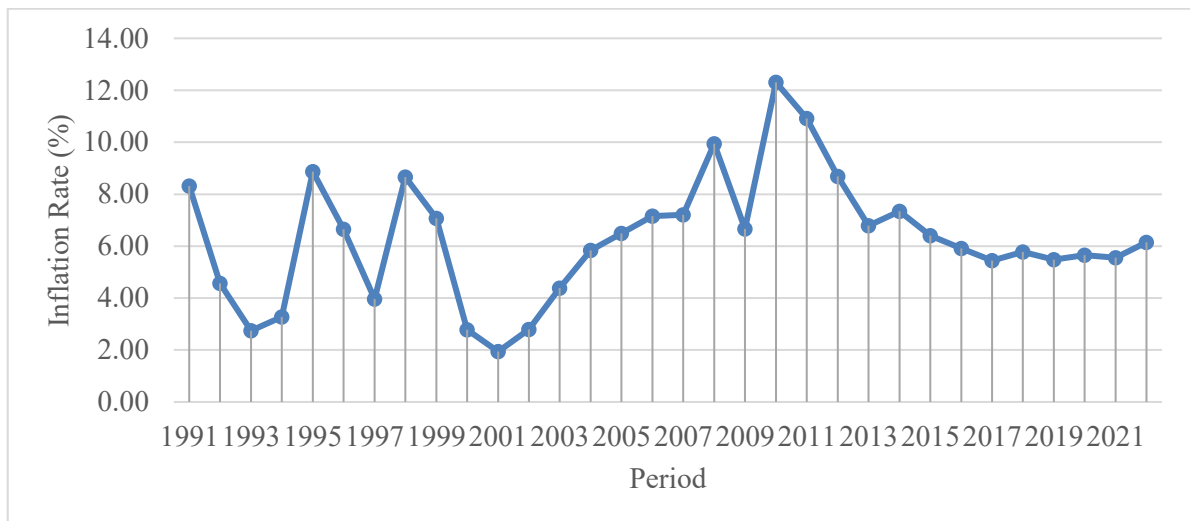


Figure 1. Inflation Rates of Bangladesh from 1991 to 2022
 Source: Bangladesh Bureau of Statistics (BBS)

Bangladesh experienced a double-digit inflation rate in 2010. After the global financial crisis in 2008, from 2009-2010, the inflation rate started to shoot up in some developing countries. This upward trend was also observed in Bangladesh. In 2010, the inflation rate was 12.31%, the highest in this period. It is important to note that there was likely a structural break in inflation trends in 2010. On the other hand, the observed period shows a historically low inflation rate (1.94%) in 2001. After 2011 (the inflation rate was 10.92%), the inflation rate started to decline. In 2016, the inflation rate was 5.92%, below 6% for the first time in twelve years. After 2017, the inflation rate started to increase steadily it was 5.44% in 2017, but at the end of 2022, it was 6.15%. Due to the Covid-19 pandemic, the world commodity market, as well as the Bangladesh economy, faced a severe disruption in economic activities. Inflation rates in Bangladesh from 1991 to 2022 are shown in Figure 1 to look at the overall inflationary trend. In Bangladesh, the annual average inflation rate was 6.30%, with large fluctuations during this period. At the same time, the annual average money supply growth was 11.52%, reflecting a lower variation than the inflation rate movement. The yearly money supply growth for the period of 1991 to 2022 is shown in Figure 2.

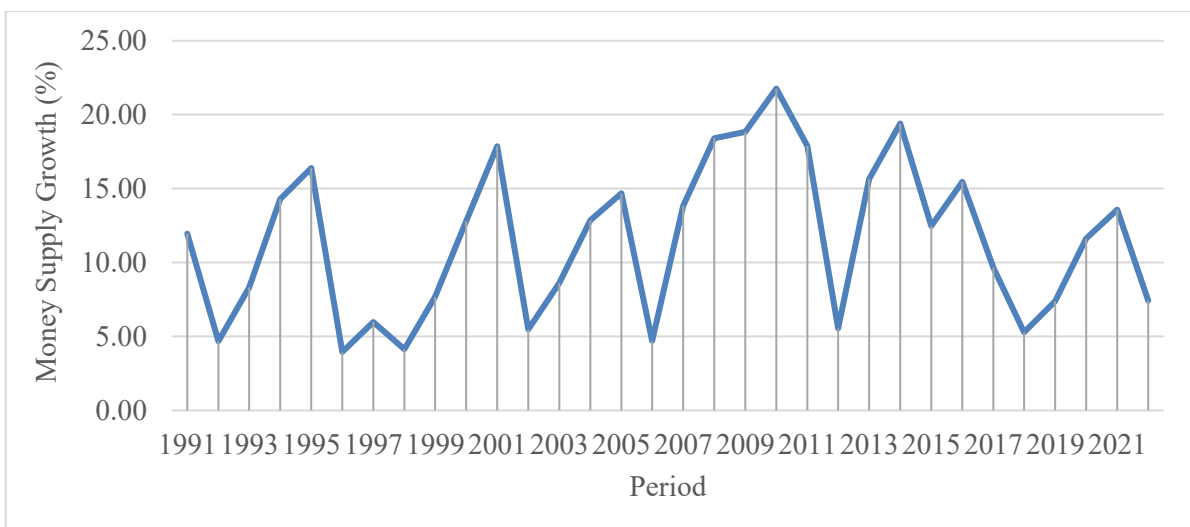


Figure 2. Money Supply Growth of Bangladesh from 1991 to 2022
 Source: Bangladesh Bank (BB)

For various reasons, the economy, like Bangladesh, has recently experienced a currency crisis and rising inflation. The country’s foreign exchange markets are now in turmoil due to a lack of foreign exchange or diminishing international reserves. This problem also causes the local currency to devalue, limiting the economy’s imports.

The nominal exchange rate movement for the period 1991 to 2022 is shown in Figure 3, which depicts a sharp exchange rate depreciation or devaluation that occurred during this period.

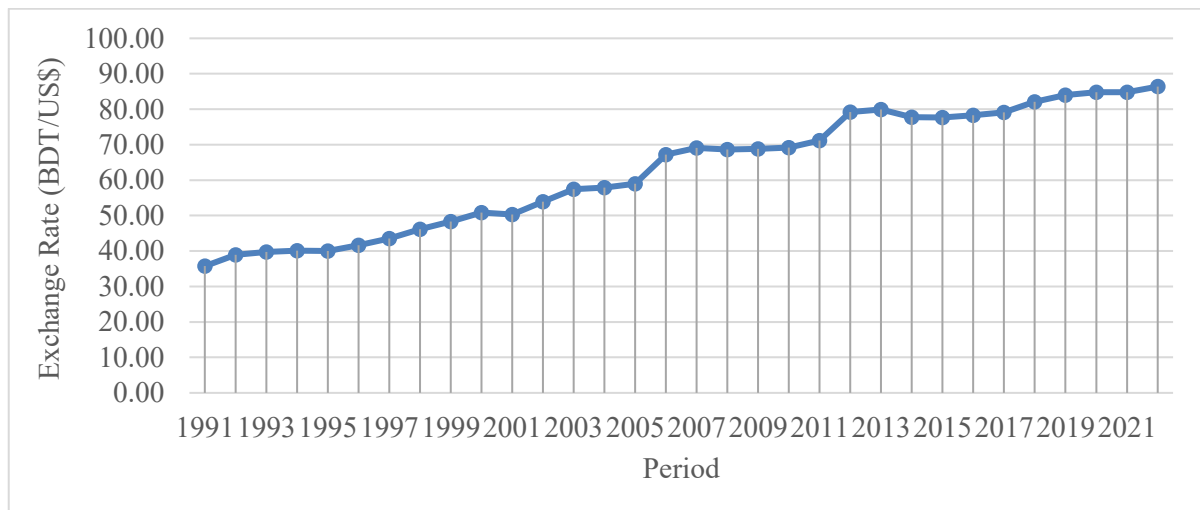


Figure 3. Nominal Exchange Rate Movement of Bangladesh from 1991 to 2022
 Source: Bangladesh Bank (BB)

As a heavily import-dependent economy, exports confront difficulties due to reliance on imported raw materials, and limiting imports of crucial products, such as fuels for energy production, has increased the country’s inflationary pressure excessively. On the other hand, another source of foreign currency gains, remittance inflows, has slowed due to the sender’s use of informal channels, as the economy lacks a stable or distinctive market-based exchange rate. When an economy enters the crisis as Bangladesh is experiencing, monetary policy and fiscal policy actions, implying a genuine policy mix, must be implemented to revive the economy. The active role of monetary and fiscal policy may be required to defend the economy from crises properly. It is critical to evaluate the function of monetary and fiscal policy in overcoming instability when the country is severely entangled in crises such as the currency crisis and the price hike problem. The effectiveness of monetary and fiscal policy must be investigated using empirical evidence to determine which policy actions would be appropriate and to respond quickly to obtain the best comprehensive options for stabilizing the economy in a crisis situation in the shortest time. In times of economic instability, such as excessive inflation and a currency crisis, coordinated monetary and fiscal policy actions could significantly defend the economy during the crisis (Debrun et al., 2021; Bergant & Forbes, 2023).

This study aims to identify the effects of monetary and fiscal policies on economic stabilization during currency crises and periods of high inflation in developing countries such as Bangladesh. This research mainly concentrates on two significant rationales. First, we investigate the effects of fiscal and monetary policies on inflation and the foreign exchange reserve. Understanding the potential consequences of such a program could aid the economy in developing and implementing the optimum policy mix for economic stabilization. Second, this research examines monetary policy’s effectiveness or relative importance over fiscal policy in recovering the economy from the crisis. However, the entire study has been carried out to obtain answers to the two research questions. What are the effects of monetary and fiscal policies on economic stabilization? Is monetary policy more effective than fiscal policy in resolving the currency crisis and excessive inflation? The auto-regressive distributed lag (ARDL) model has been used in the empirical analyses of this study to explore the given research questions since the empirical relationships have been investigated utilizing time series data. The ARDL bounds test approach has basically been implemented to find out the long-run and short-run links between the stated policies and economic agents in stabilizing the crisis.

The following section discusses a comprehensive literature review, part 3 includes methodologies with data and variable descriptions, part 4 discusses empirical results and part 5 includes concluding remarks with policy implications.

2. LITERATURE REVIEW

The comparative study of the effectiveness of monetary and fiscal policy on economic stabilization has been acknowledged as an old but comprehensive problem. Various theoretical and empirical research has been added

to this topic to understand the discretionary role of monetary and fiscal policy properly. This literature review will provide insights into comparative facts based on theoretical and empirical evidence. Many studies employing various ideas and approaches to investigate the relationship between government expenditure and economic stabilization have yielded relatively conflicting results, i.e., the conclusions of these studies have concentrated on both positive and negative outcomes. Keynes' general theory demonstrates the credibility that, in times of severe depression, fiscal action can improve economic activity. Evidence from research done by De Leeuw et al. (1969), Schmidt and Waud (1973), and Blinder (1974) also indicates the theoretical and empirical basis for fiscal policy's active engagement in the economy. Monetarist views attempt to establish the monetary role of output by claiming that fiscal policy has little effect on aggregate demand, and the relationship between money and output is established by the influential study from Friedman and Schwartz (1963). This paper also shows that changes in money growth affect production growth, as Walsh (1998) suggested. The causality of money to output will not always happen, as Benjamin Friedman and Kuttner (1992) and Tobin (1970) stated. Benjamin Friedman and Kuttner (1992) discovered an insignificant link between money and income in the United States. Gramlich (1971) summarizes the fiscal and monetary debates studies and highlights that Friedman and Meiselman (1963) focus on consistent results for money and output linkages compared to studies of output and government spending relationships. This study also endorses that monetary and fiscal policies significantly impact natural economic mobility. Anderson and Jordan (1968) argue that monetary measures are superior by examining the various effects of fiscal and monetary interventions on output. Conversely, Ando and Modigliani (1965) and DePrano and Mayer (1965) provide evidence against monetarist views. On the other hand, Carlson (1978) shows evidence that the claim from Benjamin Friedman (1977) that fiscal policy is more effective is not valid and suggests that monetary policy has a greater and more significant impact on the real economy.

Blanchard and Perotti (2002) use a structural VAR technique to investigate the empirical relationship and found that government expenditure has a positive association with output while taxes have a negative relationship. Other studies, such as Chatziantoniou et al. (2013), Chen and Xu (2020), Divino et al. (2020), Olaoye et al. (2020), and Afonso and Alves (2023), find a positive link between fiscal spending and output, which is consistent with the classical Keynesian theory. Since Mountford and Uhlig (2009) show that the tax multiplier has a more significant influence than the spending multiplier, the Keynesian perspective of a smaller multiplier of tax cuts and a larger multiplier of spending on output is not fully supported. According to particular research, such as those by Bukhari and Yusof (2014) and Hasnul (2015), government expenditure hurts the increase of actual output since it crowds out rather than multiplier impacts, and as government spending rises, the productive sector is subjected to higher taxes. Furthermore, Sutherland (1997) and Perotti (1999) found that rising public debt harmed real GDP. On the other hand, Tang et al. (2013) demonstrated that government spending had a negligible association with output in various Asian countries. Contractionary fiscal policy, like procyclical policy, rather than expansionary fiscal policy, like countercyclical policy, hampers economic recovery during a recession (Baum et al., 2012; Rafiq, 2013). Baldacci et al. (2009) and Kannan et al. (2009) discovered that fiscal expansion can shorten the recession, while countercyclical policy works well for countries with lower public debt. Furthermore, government expenditure is more effective at stimulating growth than tax cuts. Slimane and Tahar (2010) identified that several MENA nations execute procyclical fiscal policy even during crises due to inadequate fiscal strength.

Some research (Sims, 1992; Li et al., 2010; Lee & Werner, 2018) demonstrated that monetary policy has a more substantial impact in recession but is not always the consensus. Other research, such as Mutuku and Koech (2014) and Ufoeze et al. (2018), found that policy and interest rates have a minor but favorable influence on production growth. Azali and Matthews (1999) found that money had a considerable influence on output growth in the post-crisis period, using a VAR model. Fung (2002), on the other hand, demonstrated via impulse response analysis that interest rates had an insignificant effect on output in the post-crisis period. The study's results disclosing the efficiency of monetary and fiscal policy in developing nations are likewise divided. Yasmin and Korner (1987) conducted studies for Pakistan; Upadhyaya (1991) for developing countries; Jayaraman (2002) for South Pacific Island Countries; and Ali et al. (2008) for the South Asian region, all of which support the monetarist proposition that monetary actions affect the real economy. Nonetheless, some studies, such as Hussain (1982) for Pakistan and Darrat (1984) for various Latin American nations, show that fiscal policy can stimulate actual output more effectively.

Tan et al. (2020) discovered that monetary policy is more effective in promoting economic growth in Malaysia and Singapore, whereas fiscal policy is significantly more effective in Thailand. In Bangladesh, studies such as Latif and Chowdhury (1998) discovered that fiscal policy is more practical despite the constraints outlined by Stein (1980) and Ahmed et al. (1984). In contrast, Hasan (2001) discovered that monetary and fiscal policies must be equally important to stimulate the economy. Using cointegration and error correction, Younus (2014) demonstrates that monetary and fiscal policy impact real economic growth, with monetary policy being more

successful in Bangladesh. Much research conducted in light of the Monetarist (Quantity Theory of Money) or Keynesian (St. Louis equation) approaches has revealed inconsistent results rather than any fruitful consensus over the century.

Furthermore, there are no clear indications of which types of policy mix, i.e., joint fiscal and monetary policy actions, will be required for developing nations like Bangladesh during the crisis. In contrast, no recent study has been discovered that addresses the question of policy mix in light of fiscal and monetary policies that will have active relevance in fighting for economic recovery during crises such as high inflation and the currency crisis in Bangladesh. Based on prior experience in Bangladesh, no acknowledged study with sufficient empirical relationship has been established to identify the influential role of monetary policy and fiscal policy, or both, during economic crises. As a result, employing sophisticated econometric approaches, this study will be a modest attempt to assess which monetary, fiscal, or both measures might be beneficial in recovering the economy from the ongoing economic crisis.

3. METHODOLOGIES, VARIABLES and DATA

3.1. Conceptual Framework and Estimations

The conceptual framework of this study was constructed in light of macroeconomic rationales based on the Quantity Theory of Money, as well as fiscal indicators and some additional elements that can influence price and currency stability. The functioning of macroeconomic phenomena has been addressed to explain the relationship between monetary and fiscal policy and economic stability, as domestic prices in a country can be influenced by either demand-side or supply-side factors. Thus, monetary factors such as money supply and interest rates, which are demand-side indicators, can influence price changes in the economy. Furthermore, fiscal factors such as government expenditure and the import situation might impact prices, primarily demand-side indicators. In an import-dependent economy, many necessary commodities are imported to meet domestic demand, and as a result, domestic prices are highly influenced by external factors such as import prices. Based on the aforementioned conceptual framework, the specification can be phrased as follows in explaining the link between monetary and fiscal policy and inflation:

$$P = f(M, G, IR, IM) \quad (1)$$

This expression explains that price (P) is a function of money supply (M), government spending (G), interest rate (IR), and import (IM).

A similar conceptual structure can be utilized to assess the relationship between monetary and fiscal policy and currency stability. Currency crises are typically influenced by monetary measures such as money supply and interest rate as demand-side tools and fiscal measures such as government expenditure, exports, and remittances as supply-side tools. The conceptual expression can now be specified as follows:

$$ER = f(M, G, IR, EX, REM) \quad (2)$$

The expression focuses on the exchange rate (ER) as the function of money supply (M), government spending (G), interest rate (IR), export (EX), and remittance (REM).

This study's empirical framework used the ARDL model to investigate the relationship between monetary and fiscal policy, inflation, and currency stability. The use of the ARDL bounds test approach as an empirical methodology in time series econometrics allows the examination of the relationship between the combination of level variables with different orders of integration, such as I(0) or I(1) (Pesaran et al., 2001). However, this method is not applicable for regressors whose order of integration is second, I(2), or higher. Changing the order of the relationship may correct both the serial correlation and endogeneity problems (Pesaran et al., 1999). According to the ARDL framework, equations (1) and (2) can be stated as follows:

$$\Delta P_t = \beta_0 + \beta_1 M_{t-1} + \beta_2 G_{t-1} + \beta_3 IR_{t-1} + \beta_4 IM_{t-1} + \sum_{i=1}^n \gamma_{1i} \Delta P_{t-i} + \sum_{i=0}^n \gamma_{2i} \Delta M_{t-i} + \sum_{i=0}^n \gamma_{3i} \Delta G_{t-i} + \sum_{i=0}^n \gamma_{4i} \Delta IR_{t-i} + \sum_{i=0}^n \gamma_{5i} \Delta IM_{t-i} + \epsilon_t \quad (3)$$

$$\Delta ER_t = \beta_0 + \beta_1 M_{t-1} + \beta_2 G_{t-1} + \beta_3 IR_{t-1} + \beta_4 EX_{t-1} + \beta_5 REM_{t-1} + \sum_{i=1}^n \gamma_{1i} \Delta ER_{t-i} + \sum_{i=0}^n \gamma_{2i} \Delta M_{t-i} + \sum_{i=0}^n \gamma_{3i} \Delta G_{t-i} + \sum_{i=0}^n \gamma_{4i} \Delta IR_{t-i} + \sum_{i=0}^n \gamma_{5i} \Delta EX_{t-i} + \sum_{i=0}^n \gamma_{6i} \Delta REM_{t-i} + \epsilon_t \quad (4)$$

Where Δ represents the first difference operator, and n signifies the appropriate lag length included in the model for various indicators. The cointegration connection is assessed in two parts in this ARDL bounds test approach. First, the OLS regression on the above-mentioned equations (3) and (4) is run, followed by an F-test to test the

significance of the lagged variables collectively. Long-run cointegration will be identified by limiting the coefficients of the lagged variables to zero, i.e., the null hypothesis represents no cointegration among the variables. In contrast, the alternative hypothesis reflects the presence of cointegration. The Wald test (F-statistic) was used to examine cointegration because it is a non-standard distribution with the null hypothesis of no cointegration among the variables. The entire thing is based solely on whether the variables under consideration include intercept and/or trend, I(0) or I(1), the number of exogenous variables, and the observation size. The lower and upper bounds of the critical bound for the test statistic are proposed by (Pesaran & Shin, 1995; Pesaran et al., 2001). The null hypothesis of no cointegration will be rejected if the F-test value exceeds the upper bound of the critical value. It can be emphasized that, in the long run, all variables exhibit a cointegrated relationship. Because the ARDL bounds test approach estimates the long-run connection and short-run dynamics, short-run corrections can be approximated using the error correction model. As a result, equations (3) and (4) can be rewritten in error correction form as follows:

$$\Delta P_t = \beta_0 + \sum_{i=0}^n \gamma_{1i} \Delta M_{t-i} + \sum_{i=0}^n \gamma_{2i} \Delta G_{t-i} + \sum_{i=0}^n \gamma_{3i} \Delta IR_{t-i} + \sum_{i=0}^n \gamma_{4i} \Delta IM_{t-i} + \delta ECT_{t-1} + \mu_t \quad (5)$$

$$\Delta ER_t = \beta_0 + \sum_{i=0}^n \gamma_{1i} \Delta M_{t-i} + \sum_{i=0}^n \gamma_{2i} \Delta G_{t-i} + \sum_{i=0}^n \gamma_{3i} \Delta IR_{t-i} + \sum_{i=0}^n \gamma_{4i} \Delta EX_{t-i} + \sum_{i=0}^n \gamma_{5i} \Delta REM_{t-i} + \delta ECT_{t-1} + \mu_t \quad (6)$$

The term ECT denotes the error correction from short-run disequilibrium in the long-run equilibrium relationship. In contrast, the coefficient of ECT measures the rate of adjustment from shock to equilibrium. This coefficient's negative and significant value demonstrates the variables' convergence towards long-run equilibrium.

3.2. Variables

In this investigation, log-transformed variables are used. Price (P) is measured by the consumer price index with a base year of 2005-2006 equal to 100, money supply (M) is measured by the nominal volume of broad money (M2) supply in million US dollars, government spending (G) is measured by government development expenditure in million US dollars, and interest rate (IR) is measured by the prime rate, which is the weighted average lending rate of the banking industries. The nominal exchange rate of BDT (Bangladesh Taka) per US dollar is represented by the exchange rate (ER); export (EX) denotes the readymade garment (RMG) export volume in a million US dollars; import (IM) denotes the volume of import payments in a million US dollars; and remittance (REM) denotes the volume of remittance inflows in a million US dollars.

3.3. Data source

This study's empirical analyses utilized annual time series data from 1991 to 2022. Bangladesh Bank (BB) provided information on the money supply (M), interest rate (IR), import (IM), remittance (REM), and exchange rate (ER). The Bangladesh Bureau of Statistics (BBS), Ministry of Finance (MoF), and Bangladesh Garment Manufacturers and Exporters Association (BGMEA) provided data on prices (P), government spending (G), and exports (EX).

4. DISCUSSION and EMPIRICAL RESULTS

The descriptive statistics for the study variables are presented in Table 1. It's worth noting that all the indicators considered in this research are log-transformed. This helps to increase the linearity of the empirical relationship by reducing heterogeneity and promoting the normality of the data. The descriptive statistics table indicates that the mean value of the variables falls within the middle point of the maximum and minimum values, with minimum standard deviation. The skewness and kurtosis values of the variables range from -2 to 2, indicating that the variables are normally distributed. Additionally, the probability values of the Jarque-Bera test suggest that, except for the variable IR, all variables follow the normality assumption. This means that the observations are likely to come from a normal distribution.

Table 1. Descriptive Statistics

Z	P	M	G	IR	ER	IM	EX	REM
Mean	4.7399	10.4432	7.8444	2.4756	4.1034	9.6891	9.0123	8.4792
Median	4.6399	10.2647	7.5650	2.5335	4.2177	9.6744	9.0514	8.5863
Maximum	5.7241	12.1946	9.4902	2.7160	4.4588	11.2844	10.659	10.1177
Minimum	3.8559	8.8531	5.3245	1.9586	3.5762	8.0446	6.7648	6.6384
Std. Dev.	0.5971	1.0800	1.0086	0.1957	0.2848	0.9615	1.1249	1.1356
Skewness	0.1591	0.1484	0.0249	-1.2363	-0.3882	-0.1389	-0.2839	-0.1826
Kurtosis	1.6665	1.6441	2.8109	3.8609	1.7109	1.7928	1.9271	1.4976

Jarque-Bera	2.5058	2.5688	0.0509	9.1399	3.0193	2.0458	1.9649	3.1873
Probability	0.2856	0.2768	0.9748	0.0103	0.2209	0.3595	0.3743	0.2031
Observations	32	32	32	32	32	32	32	32

The empirical analysis employing time series data includes variables with a non-stationary problem. The stationarity test determines whether or not the variables have a unit root. This test is used to determine the order of integration that variables exhibit, and based on this, variables will be classified as stationary either in level $I(0)$, or in the first difference, $I(1)$. The Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests were used to perform the unit root tests, and the findings are given in Table 2. The findings of the unit root tests reveal that all of the study variables reflect the order of integration at the first difference or level; thus, the analysis can use the ARDL bounds test approach to investigate the presence of a long-run relationship among the variables.

Table 2. Results of Unit Root Tests

Augmented Dickey-Fuller (ADF) Test		
Variables	Level	1st Difference
P	0.3354	-2.9585*
M	0.8845	-3.9856***
G	-0.7844	-8.8169***
IR	0.6044	-4.4355***
IM	-0.4858	-4.8651***
ER	-1.8512	-5.0753***
EX	-2.1396	-5.4593***
REM	-1.1962	-4.7550***
Phillips-Perron (PP) Test		
Variables	Level	1st Difference
P	0.7903	-2.8665*
M	0.8845	-3.9534***
G	-1.1301	-11.7726***
IR	0.5818	-3.3018**
IM	-0.4143	-4.9524***
ER	-4.6326***	-5.1139***
EX	-2.3189	-5.4617***
REM	-1.1428	-4.9378***

Notes: *** $p < 0.01$, ** $p < 0.05$, and * $p < 0.1$ mean statistical significance at 1%, 5%, and 10%, respectively

Apart from conducting standard unit root tests for stationarity, this study also employs the breakpoint unit root test for the variables. This is because the time series data may violate the stationarity property due to the presence of several breakpoints, and the existence of structural breaks might be the reason behind non-stationarity in the time series data. Table 3 displays the results of the breakpoint unit root test. The findings indicate that the variables being studied exhibit first-order integration with different breakpoints, after considering the breakpoint selection by Dickey-Fuller min-t. However, none of the variables show stationarity at the level. Since the study variables exhibit the first difference order of integration with breakpoint, the mixed order of integration in standard unit root tests in the time series is not due to a structural break. Hence, based on these facts, we can utilize the ARDL technique to determine the long-run cointegration among the variables, without any breakpoint, since the occurrence of structural breaks does not involve non-stationarity for the time series variables.

Table 3. Results of Unit Root Test with Breakpoint

Variables	Level		1st Difference	
	t-Statistic	Breakpoint	t-Statistic	Breakpoint
P	-1.9716	2005	-5.3882***	2001
M	-3.1190	2007	-4.2399*	1998
G	-3.5564	2012	-9.1606***	2003
IR	-3.4634	2019	-5.7624***	2014
IM	-2.6132	2004	-5.3412***	1995
ER	-4.2070*	2001	-5.3860***	2013
EX	-3.9297	2005	-6.0166***	1998
REM	-3.1239	2005	-5.6977***	2017

Notes: ***, **, and * mean statistical significance at 1%, 5%, and 10%, respectively

The F-test for the null hypothesis of no cointegration, as well as a selection of lag length using the Akaike information criterion (AIC), were used to investigate long-run cointegration. Table 4 shows the cointegration test results, which show that the estimated value of the F-statistic for both specifications exceeds the critical region's upper bound at the 1% significance level. This indicates a long-run relationship between the variables included in both specifications, such as inflation, monetary factors, and fiscal factors, as well as currency, monetary factors, and fiscal factors.

Table 4. Cointegration Test

Model Specification	Test Statistic	Value	Significant level	I(0)	I(1)
$P = f(M, G, IR, IM)$	F-statistic	8.08	10%	2.20	3.09
			5%	2.56	3.49
			2.5%	2.88	3.87
			1%	3.29	4.37
			10%	2.08	3.00
$ER = f(M, G, IR, EX, REM)$	F-statistic	8.02	5%	2.39	3.38
			2.5%	2.7	3.73
			1%	3.06	4.15

The long-run coefficients were estimated using OLS after assessing the existence of cointegration, and the estimation results are shown in Table 5. At the same time, the considered lag of each of the study variables in the ARDL specification is chosen based on the AIC.

Table 5. Estimation of the Coefficients of Long-Run Relationship

Model Specification: $P = f(M, G, IR, IM)$ ARDL (1, 0, 0, 0, 2)		Model Specification: $ER = f(M, G, IR, EX, REM)$ ARDL (1, 1, 0, 2, 2, 1)	
Regressors	Coefficients	Regressors	Coefficients
M	0.3539***	M	-1.7044
G	0.0370*	G	0.0015
IR	0.0826	IR	-0.5753
IM	0.2198**	EX	-0.0852
		REM	1.7791

Notes: ***, ** and * mean statistical significance at 1%, 5%, and 10%, respectively

According to the estimated coefficients of the long-run relationship between inflation, monetary, and fiscal factors, money supply influences inflation more than government spending, with 0.35% and 0.037% increases in inflation occurring in 1% increases in money supply and government spending, respectively. This relationship between inflation, money supply, and government spending supports monetarist and Keynesian viewpoints since monetary and fiscal policy's combined actions are required to control inflation in Bangladesh. However, the more significant influence of money supply on inflation than government spending tells us that monetary actions are somewhat more effective than fiscal actions in controlling high inflation. In contrast, the interest rate has no statistically significant association with inflation, but imports positively influence inflation, with a 1% rise in imports influencing a 0.219% increase in inflation. These findings show that interest rate instruments have little influential contribution that can handle domestic price changes. Furthermore, in Bangladesh, rises in import payments might influence inflation, indicating that rising import prices on the global market can dramatically boost domestic prices.

The long-run estimation results of the relationship between the exchange rate, monetary factors, and fiscal factors show statistically insignificant results, implying that the money supply, government spending, interest rate, exports, or remittances do not influence the exchange rate or currency instability in Bangladesh. Although this long-term relationship has little statistical consistency, the negative signs obtained by the coefficients of money supply, interest rate, and export provide some insightful economic direction. While economic thought suggests that the exchange rate or currency instability, which means the depreciation of the Bangladeshi taka, can be handled by increasing the money supply and interest rate, Because the country's currency rates are not market-based, the central bank has already adopted this strategy by intervening in foreign exchange markets to stabilize the exchange rate. This mechanism, however, is no longer credible for resolving the currency problem. As a result, more exports of diverse items and increased remittance inflows through proper channels are required, and excessive import demand must be addressed by expanding domestic output.

The error correction method estimates the short-run dynamic adjustment in the long-run cointegration relationship. The estimated coefficients of ECT for the link between monetary and fiscal factors, inflation, and the exchange rate are shown in Table 6. The coefficient of ECT in the relationship between inflation, monetary factors, and fiscal factors has a negative sign. It produces statistically significant results, implying that around 33% of disequilibrium will adjust to the long-term equilibrium path in the short run by a year. It is estimated that the adjustment rate will take approximately three years to return to equilibrium in the relationship of inflation stabilization. The short-run adjustment mechanism implies that imports have a greater impact on stabilizing prices in the long-run equilibrium relationship. As a result, the combined effort of monetary and fiscal interventions can moderate inflationary pressures in the domestic market in three years.

The long-run link between exchange rates and monetary and fiscal factors has not demonstrated any statistical significance of the influence of fiscal and monetary measures on exchange rates. In the estimation of error correction, the coefficient of ECT has a statistical significance with a negative sign, indicating that only 6% of the error will adapt to the long-run equilibrium point in a year. Although money supply and export offer significant short-run benefits for achieving long-term exchange rate stability, in Bangladesh, various other factors, such as trade-based money laundering, over-import reliance, and unsuitable channels of remittance inflows, may be involved in currency instability.

Table 6. Estimation of the Short Run Dynamics

Model Specification: $P = f(M, G, IR, IM)$, ARDL (1, 0, 0, 0, 2)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(IM)	0.1048	0.0188	5.5643	0.0000
D(IM(-1))	-0.0583	0.0224	-2.5979	0.0168
ECT(-1)	-0.3266	0.0126	-25.7874	0.0000
Model Specification: $ER = f(M, G, IR, EX, REM)$, ARDL (1, 1, 0, 2, 2, 1)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(M)	-0.7433	0.0899	-8.2649	0.0000
D(IR)	0.1250	0.0493	2.5365	0.0207
D(EX)	-0.0969	0.0324	-2.9870	0.0079
D(EX(-1))	-0.0964	0.0334	-2.8815	0.0099
D(REM)	0.0279	0.0272	1.0236	0.3195
ECT(-1)	-0.0625	0.0072	-8.6522	0.0000

Notes: D indicates first difference, (-1) refers one lag and ECT represents error correction term

The robustness of the ARDL estimation was tested using multiple diagnostic tests for the estimated residuals, such as autocorrelation, normality, and heteroscedasticity. The model specification, also known as the structural stability test, is used to determine whether or not the specification is stable. The results in Table 7 show that both models are free of the autocorrelation problem and adhere to the normality and homoscedastic assumptions. The Ramsey Reset test confirms that both models' specifications are stable and have no specification errors.

Table 7. Robustness Check for ARDL Estimations

Model Specification	$P = f(M, G, IR, IM)$		$ER = f(M, G, IR, EX, REM)$	
	Test	Test Statistic	Test Statistic	Prob.
Serial Correlation	F-statistic = 0.3272	0.7242	F-statistic = 1.3155	0.2958
Normality test	Jarque-Bera = 3.4302	0.1799	Jarque-Bera = 2.2677	0.3217
Heteroscedasticity	F-statistic = 0.4814	0.7867	F-statistic = 0.6974	0.7255
Ramsey Reset	F-statistic = 0.7454	0.3965	F-statistic = 0.0937	0.7632

In addition, the stability of the ARDL estimators' parameters has been tested using the cumulative sum of recursive residuals (CUSUM) test and the cumulative sum of recursive residual squares (CUSUM-squares) test. The results are presented in Figure 4, Figure 5, Figure 6, and Figure 7. The estimated values of CUSUM and CUSUM-squares for both models are within the boundary of the 5% significant level. This indicates that the models are structurally stable, and there have been no structural breaks in the long-term stability among the mentioned relationships.

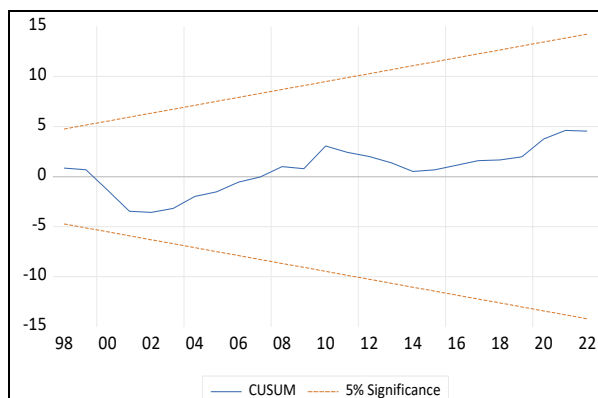


Figure 4. CUSUM Test of Recursive Residuals for Price Model

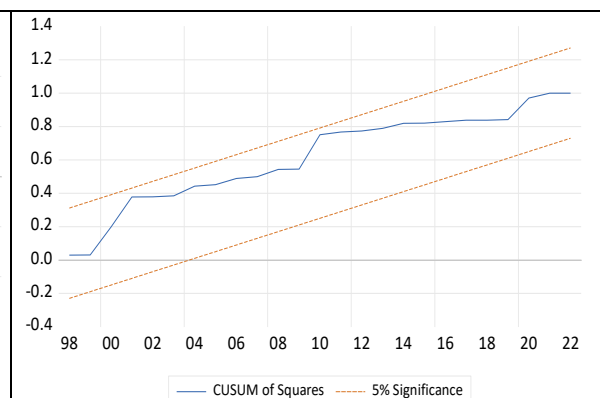


Figure 5. CUSUM-squares Test of Recursive Residuals for Price Model

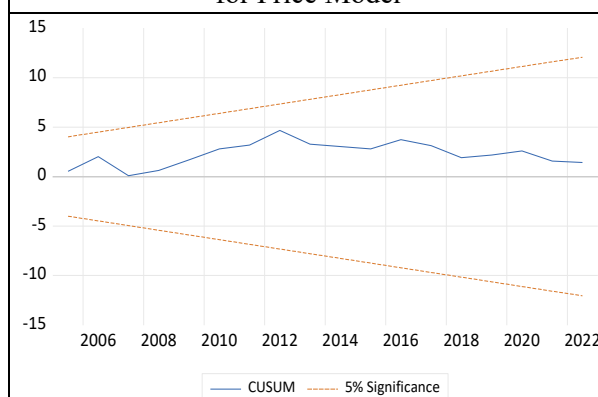


Figure 6. CUSUM Test of Recursive Residuals for Exchange Rate Model

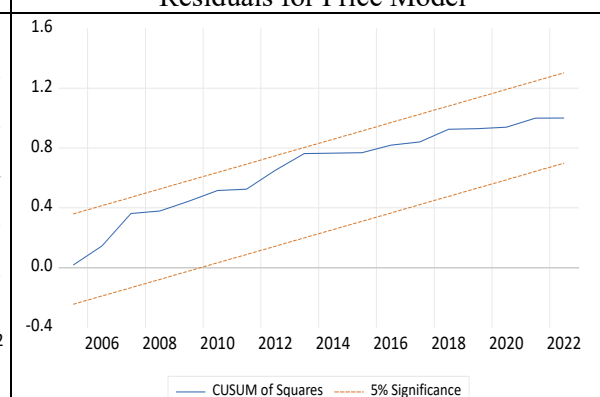


Figure 7. CUSUM-squares Test of Recursive Residuals for Exchange Rate Model

5. CONCLUSION and POLICY IMPLICATIONS

In recent years, Bangladesh has experienced high inflation and a currency crisis. Although some external factors, such as the Russia-Ukraine war, contribute to the country falling into such crises, some internal factors, such as money laundering, contribute to the country going into such crises. Aside from these considerations, how can a country's two key monetary and fiscal policies work together to rebuild the economy from economic crises such as the currency crisis and excessive inflation? This study aims to investigate the effects of monetary and fiscal policy on stabilizing Bangladesh's currency crisis and rising inflation. This study employs an ARDL bounds test approach to analyze the empirical link between monetary and fiscal policies on inflation and the exchange rate using annual time series data on various indicators from 1991 to 2022. The study's findings show that money supply and government expenditure have a considerable positive influence on inflation.

However joint actions or a policy mix of monetary and fiscal policies can quickly stabilize excessive inflationary pressures. The results obtained from this analysis are consistent with the research conducted by Hasan (2001) and Yunus (2014), but somewhat inconsistent with the findings of Latif and Chowdhury's (1998) study. The results of this study confirm the findings of Tan et al. (2020) for Malaysia and Singapore. Although monetary and fiscal variables do not seem to have a significant impact on exchange rate stability, it is noteworthy that the exchange rate in Bangladesh is not market-based and may be influenced by other factors. However, it is likely that variables such as money supply, exports, and remittances may have a significant impact on currency stability in the economic context.

To maintain price stability in the domestic market, it should be required to ensure adequate coordination between monetary and fiscal policy. Once monetary policy can be established independently, fiscal dependence on monetary policy should be reduced for budget deficit financing. The prices of local markets are affected by both demand and supply-side factors. Essential goods are mostly imported, which results in an increase in domestic market prices being influenced by external factors as well as internal ones. Therefore, it is important to reduce import dependency to prevent price hikes in the domestic market. To stabilize the currency, it is crucial to diversify products and increase export receipts in order to enhance export earnings. Additionally, promoting regular inflows of remittance through proper channels could also contribute to currency stability.

This study uses annual time data to examine the effects of monetary and fiscal policy on price and currency stability; nevertheless, employing high-frequency data with different approaches and integrating other explanatory factors might be researched to address this analysis's research gap.

AUTHORS' DECLARATION:

This paper complies with Research and Publication Ethics, has no conflict of interest to declare, and has received no financial support.

AUTHORS' CONTRIBUTIONS:

The entire research is written by the author.

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Pollution Haven Hypothesis: Smooth Quantile Evidence from BRICS

Kirlilik Cenneti Hipotezi: BRICS'ten Düzleştirilmiş Kantil Kanıtlar

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ABSTRACT

Keywords:

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Pollution, like everything else, can be carried along with globalization. This approach, which refers to the pollution carried by the capital, is the pollution haven hypothesis. This study investigates the effects of foreign direct investment (FDI) on carbon dioxide (Co2) emissions in the BRICS countries from 1992 to 2020. We employed the instrumental variables smooth quantile regression (SIV-QR) method, which is novel in panel econometry. We found that per capita income has an increasing effect on carbon emissions in all estimators with all quantiles. In addition, our findings indicate that FDI flows have a decreasing effect on Co2 in high quantiles. However, the FDI plot estimates of the simultaneous quantile regression show that this has an increasing effect in low quantiles. This means that, at low quantiles, the pollution hypothesis is valid. This can help uncover possible relationships between the routes of money and carbon dioxide emissions.

ÖZET

Anahtar Kelimeler:

Kirlilik Cenneti,

Carbon Dioksit
Emisyonları,

Düzleştirilmiş Kantil
Regresyon

Jel Kodları:

C02 C30 C44

Her şey gibi kirlilik de küreselleşmeyle birlikte taşınabilir. Sermayenin taşıdığı kirliliği ifade eden bu yaklaşım, kirlilik cenneti hipotezidir. Bu çalışma, 1992-2020 dönemi için BRICS ülkelerindeki doğrudan yabancı yatırımın (DYY) karbondioksit (Co2) emisyonları üzerindeki etkilerini araştırmaktadır. Çalışmamızda panel ekonometrisinde yeni olan araçsal değişkenli düzleştirilmiş kantil regresyon (SIV-QR) yöntemini kullandık. Kişi başına düşen gelirin, tüm tahmincilerde ve kantillerde karbon emisyonları üzerinde artırıcı bir etkiye sahip olduğunu bulduk. Ayrıca bulgularımız doğrudan yabancı yatırım akışlarının yüksek oranlarda Co2 üzerinde azaltıcı bir etkiye sahip olduğunu göstermektedir. Ancak eş zamanlı kantil regresyonun DYY grafiği tahminleri, bunun düşük kantil dilimlerde artan bir etkiye sahip olduğunu göstermektedir. Bu, düşük kantillerde kirlilik cenneti hipotezinin geçerli olduğu anlamına gelir. Bu bulgular, paranın rotası ile karbondioksit emisyonları arasındaki olası ilişkilerin ortaya çıkarılmasında yardımcı olabilir.

1. INTRODUCTION

Global warming and the resulting climate crisis are leading global problems in the 21st century. One of the mother-lode feedings in the climate crisis is greenhouse gas and carbon dioxide emissions. Carbon dioxide emissions, which are closely related to the consumption of fossil fuels, are also the subject of trade between regions and countries. It is a cap-and-trade system or an emissions trading system. On the one hand, economic growth is of core importance for the markets. Environmental measures implemented by countries or regional associations can also determine the route of carbon emissions. Globalization has not only mobilized capital but also activated carbon emissions.

One of the issues emphasized in recent years is economic growth, energy consumption, and pollution (Muhammad, 2019; Chang & Li, 2018; Shahbaz et al, 2023). While most studies have focused on economic growth, energy consumption, and pollution, the effects of foreign direct investment flow on pollution have been relatively less researched (Bakhsh et al., 2017). To fill this gap, our study aims to discover the relationship between foreign direct investment, Co₂, and economic growth.

Increased environmental awareness in developed countries may affect the geographical location or amount of production. Environmentally friendly policies of developed countries and clean production (Cole, 2004) affect the profitability of production processes through various factors. One way to prevent a possible decline in profit rates is to shift production centers to developing countries with relatively weak environmental policies (Cole, 2004). Apart from this, costs per unit can be reduced with environmentally friendly technologies, and for this reason, developing environmentally friendly production relations with intensive technology is among the possibilities. The second possibility emphasizes the reducing effects of investments in technology on pollution. In other words, this effect is known as the technological effect, in which direct foreign investment flows reduce pollution (Chang & Li, 2018). The first possibility is referred to as the pollution haven hypothesis, or the race to the bottom concept (Dean et al., 2009; Khan & Öztürk, 2020). Although both can be observed in modern economies, this study focuses on the first possibility.

While foreign direct investments, which can also be an indicator of fragility (Abdilabekov & Kaleci, 2020), increase economic growth, it can also increase environmental pollution through industrial activities (Aslan et al., 2021; Khan & Öztürk, 2020; Koçak & Şargüneşi, 2018). Foreign direct investment (FDI) flow, which is currently considered one of the driving forces of economic growth (Nasir et al., 2022), can also be the driving force of an insidious result. Among the mainstream approaches, studies such as French (1998), Cole (2004), Dean et al. (2009), Pao & Tsai (2011), and Omri et al. (2014) are pioneering studies focusing on the effects of foreign direct investments on pollution.

Today, as in the past (Pao & Tsai, 2011), BRICS countries are pioneers of investment destinations in the world. These countries also account for a large share of the world economy in terms of economic growth, energy exports, technology exports, and trade. In addition, since 2006, China has surpassed the USA in terms of Co₂ from fossil fuels and industry (OWD, 2023a).

Based on these explanations, this study examines the effects of FDI flows on carbon dioxide emissions in BRICS countries. We employ the instrumental smooth quantile regression method developed by Kaplan & Sun (2017), which can be considered a novel method in panel econometrics. This method smooths the tool function rather than the goal, thereby increasing its reliability compared to other instrumental methods. The modest contributions of our study to the literature are as follows: First, unlike the literature, this study addresses the effects of FDI flows on Co₂ in BRICS countries using quantile methods. Second, this study is the first to address the effects of FDI flows on Co₂ with the smooth quantile approach in BRICS countries. While our findings indicate increased effects of FDI flows on Co₂ in low quantiles, the quantile plot estimates show that this effect turns to decreased effects on high quantiles.

This paper is organized as follows: Section 2 presents recent studies. Section 3 provides information on the datasets, methods, and models. Section 4 presents our findings and discussion. Finally, we conclude the study with policy recommendations.

2. LITERATURE REVIEW

Many empirical studies have been conducted on the direction and magnitude of the relationship between Co₂ emissions and macroeconomic variables. In addition to carbon dioxide emissions and foreign direct investment, some studies have focused on variables such as economic growth (Xiong & Xu, 2021), exports (Li et al., 2023),

foreign trade (Kander & Lindmark, 2006), imports, and debt (Boly et al., 2022). On the other hand, some studies examined the effects of FDI on industrialization such as Topcu (2016), Adom & Amuakwa-Mensah (2016), Voumik & Ridvan (2023) and Çetin et al (2023). Some studies examined the impact of financial development on environmental issues (Topcu, 2022; Kong et al., 2024; Oanh, 2024).

Among some studies that integrated the FDI variable into the EKC model, Keho (2015) researched the FDI effect on Co₂ for West African States. The authors employed Autoregressive Distributed Lagged (ARDL), and their findings obtained with time series differ by country. The effects of FDI on Co₂ emissions are negative in some countries and positive in others. Tang & Tan (2015) similarly integrated the EKC and FDI for Vietnam. The authors' findings differ between the short- and long-term. Their findings showed that, while FDI had a reducing effect on Co₂ in the long term, it was not statistically significant in the short term. However, according to the causality test results, FDI causes Co₂ in the long term.

Peng et al (2016) investigated the causality between FDI and Co₂ in China's provinces between 1985 and 2012. Their findings showed one-way causality in some provinces and two-way causality in others. Ali et al (2017) used ARDL and Dynamic Ordinary Least Square (DOLS) methods in their research examining the EKC model and FDI for Malaysia between 1971 to 2013. They found no statistically significant relationship between FDI and Co₂. Bakhsh et al. (2017) investigated the effects of FDI on environmental pollution in Pakistan from 1984 to 2014 with a simultaneous equation model. They found that FDI is positively related to pollution.

Behera & Dash (2017) researched FDI impact on Co₂ for the 17 countries in the South and Southeast Asian (SSEA) region during the period 1980-2012. They divided the countries into three groups according to their income level. Their findings showed that FDI had an increasing effect on Co₂ emissions in high-income and middle-income countries, while it was not statistically significant in low-income countries. Sapkota & Bastola (2017) provide evidence of the increasing pollution effects of FDI on Co₂ in a sample of 14 Latin American countries, and Chang & Li (2018) in a sample of 84 countries.

While Koçak & Şarkgüneşi (2018) found increasing effects of FDI on Co₂ in Turkey's 1974-2013 period, Haug & Ucal (2019) found no statistically significant relationship for Turkey between 1974-2014. Salahuddin et al. (2018) investigated the effects of FDI on Kuwait using ARDL in the 1980-2013 period. They find that FDI has an increasing effect on Co₂. Muhammad & Khan (2019) investigated the Co₂ effects of FDI in 34 host countries of Asia and 115 source countries with the GMM method. In addition, Khan & Öztürk (2020), Aslan et al (2021), and Awan et al (2022) found that FDI increases Co₂. Essandoh et al. (2020) investigated FDI and Trade effect on Co₂ for the developed and developing countries for the period from 1991 to 2014. They used a panel pooled mean group-autoregressive distributive lag (PMG-ARDL) approach and found that Co₂ emissions only it reveal that it has a long-term positive relationship with FDI inflows for developing countries. In addition, Liu et al. (2024) examined the effect of China's FDI on environmental issues through Belt and Road countries using the EKC model. They employed second-generation tests, and their findings showed that FDI has a decreasing effect on Co₂ in 16 European countries, in contrast to 30 Asian and MENA countries. Also, Marques & Caetano (2020) found that FDI affects emissions differently in high- and middle-income countries. In high-income countries, FDI reduces emissions, whereas in middle-income countries, it increases emissions in the short run. This finding supports the pollution haven hypothesis, which posits that countries with lower environmental standards attract investment by offering lower production costs and weaker regulations, thus leading to higher emissions.

Differing from above, Dhrifi et al. (2020) investigated the effects of FDI on Co₂ for 98 developing countries over the period 1995-2017 using simultaneous equations models (SEM's). They separated countries according to their geographical situation, but their global findings showed a bidirectional causal relationship between FDI and Co₂. Xie et al (2020) discovered the nonlinear relationships FDI and Co₂ in emerging countries. They found that FDI affected Co₂ concentrations differently. Directly, this raises Co₂ levels. However, through spillover effects on economic growth, FDI can decrease Co₂ concentrations. The total effect of FDI on Co₂ leakage changes from positive to negative with increasing FDI inflows, supporting the pollution haven and pollution halo hypotheses. Balsalobre-Lorente et al. (2022) researched the effects of foreign direct investment, economic growth, urbanization, and energy use on carbon emissions in BRICS countries from 1990 to 2014. They employed the FMOLS and DOLS methods. Their findings showed that FDI with energy use generates an increased effect on carbon emissions. Similarly, Mohsin et al (2022) investigated the effect of foreign direct investment, economic growth, energy consumption and personal remittances on carbon emissions in European and Central Asian countries. Their ARDL estimator findings show that FDI Granger causes Co₂ emissions, and FDI has a decreased effect in the long run and an increased effect in the short term.

Research on the impact of FDI on carbon dioxide emissions has typically employed either the base EKC or hybrid EKC model as a framework. The outcomes of these studies have been inconsistent and depend on factors such as the period studied, methods employed, and sample sizes used. Additionally, most of the included studies employed linear estimators in their research. It is difficult to generalize the findings of these studies in terms of FDI, but while the effects of FDI on carbon emissions are positive in developed countries, they are negative in developing or emerging economies. Some studies divide the effects of FDI on Co2 into short- and long-term effects. However, the findings are scattered in this regard, and the coefficient signs may differ, regardless of the country’s development level. Estimating the relationship between FDI and Co2 using nonlinear methods depending on the business cycle is important because FDI, which is related to both economic growth and global risk, is directly affected by business cycles. However, there is a notable gap in the literature on this subject. This study contributes to the literature in this respect.

3. SAMPLE, DATA, MODEL AND METHODOLOGY

This study investigates the effects of FDI flow on Co2 emissions in five emerging economies (Brazil, Russia, India, China, and South Africa (BRICS)). We employ panel data methods in our study. Panel data analysis has many advantages (seen for details Koç & Günay, 2023).

BRIC was first introduced by O’Neill (2001), and South Africa was joined in 2011 (Chatterjee & Naka, 2022). We considered three aspects of BRICS when determining the sample. The first is their attitude towards carbon emissions, the second is their relatively weak environmental policies compared to Europe, and the last is their stability in foreign direct investment inflows.

This study was inspired by the model developed by Omir et al. (2014), Shahbaz et al. (2019), and Salahuddin et al. (2018). We adopted the Bakhsh et al. (2017) time-series model for the panel estimation. The functional definition is as follows and Equation 2:

$$\text{Co2} = f(\text{GDP}, \text{FDI}) \tag{1}$$

$$\ln\text{Co}_{2it} = \alpha_0 + \beta_1 \ln\text{Gdp}_{it} + \beta_2 \ln\text{Fdi}_{it} + \varepsilon_{it} \tag{2}$$

Equation 2 is a double-log model where Co2 is carbon dioxide emissions per capita, Gdp is gross domestic product per capita (constant, 2015 US\$), FDI is foreign direct investment, net inflow (% of GDP), and ε is the error term. In addition, we used two instrumental variables (electricity consumption and population density) in our model. The definitions, abbreviations, and sources of variables are listed in Table 1.

Table 1. Data Information

Variable	Definition	Unit	Data source
Co2	Carbon dioxide emissions	Co2 per capita	OWD (2023a)
Eu	Energy consumptions	Primary energy consumption per capita (kWh/person)	OWD (2023b)
Gdp	Gross Domestic Product	GDP per capita (constant 2015 US\$)	WDI (2023)
Fdi	Foreign direct investment	Foreign direct investment, net inflows (% of GDP)	
Pop	Population density	Population density (people per sq. km of land area)	

In the economic approach, one of the main issues in creating a model is the use of exogenous and instrumental variables. In a model, some variables can be explained by other variables while some variables cannot be explained by other variables. To take this into account, we assume that GDP is endogenous and FDI exogenous. Considering that GDP can be explained by different variables, instrumental variables are also included in the model. These are energy consumption and population density.

In the current study, which is based on foreign direct investments and economic growth, we used an effective method that theoretically considers endogenous and exogenous. For this purpose, we prefer a novel method recently developed in panel econometrics. Kaplan & Sun (2017) developed smoothed quantile estimating equations, a quantile method that allows the use of instrumental data. In this method, instrumental variables quantile regression was added, and the authors developed it to smooth the indicator function (namely, SIV-QR).

SIV-QR has some advantages as a kernel-based nonparametric conditional quantile estimator. i) This method can be easily calculated using a standard iterative algorithm that requires smoothness; ii) owing to the smoothing estimator of SIV-QR, the method has high-order properties; iii) SIV-QR is a flexible set of estimators that includes

IV/OLS mean regression estimators and median and quantitative regression estimators; and iv) SIV-QR reduces the mean square error, which creates more powerful tests (see for detail Kaplan & Sun (2017)).

4. EMPIRICAL FINDINGS

Table 2 presents descriptive statistics. Eu and Gdp means are higher than others respectively. The standard divisions of Co2 and Fdi are lower than the rest. Skewness shows that only Gdp is positively skewed, while the others are negatively skewed.

Table 2. Descriptive Statistics

	Mean	Std. Dev.	Min.	Max.	Skewness	Kurtosis
Co2	5.52	3.88	.72	13.2	.262	1.50
Gdp	5254.0	2923.1	546.4	10358.2	-.16	1.83
Fdi	2.11	1.45	.002	6.18	.55	2.42
Pop	120.5	145.2	8.71	469.65	1.25	3.08
Eu	23135.2	17312.9	2812.7	64323.9	.84	2.51

While the kurtosis value belonging to Pop is about mesokurtic (normal distribution), Co2, Gdp, and Eu are leptokurtic (T-distributions) and platykurtic (uniform distributions). Therefore, most variables did not have a normal distribution. Therefore, nonparametric methods may be more effective for our estimations.

Table 3. Partial Correlations of Carbon Dioxide Emission

	Partial Corr.	Semi partial	Partial Corr ²	Significance Value
lnGdp	-0.59	-0.11	0.35	0.0000
lnFdi	-0.17	-0.02	0.03	0.0382
lnEu	0.97	0.681	0.95	0.0000
lnPop	0.80	0.208	0.65	0.0000

While the partial correlation results provide some proof of the effects of Gdp and Fdi flow on Co2, the fact that we received confirmed findings with the semi-partial results provides key information about the explanatory power of the control variables. Figure 1 shows the estimation results of the function in Equation 1 by weighted least-squares regression, with the weighted versions of lnFdi (left) and lnGdp (right).

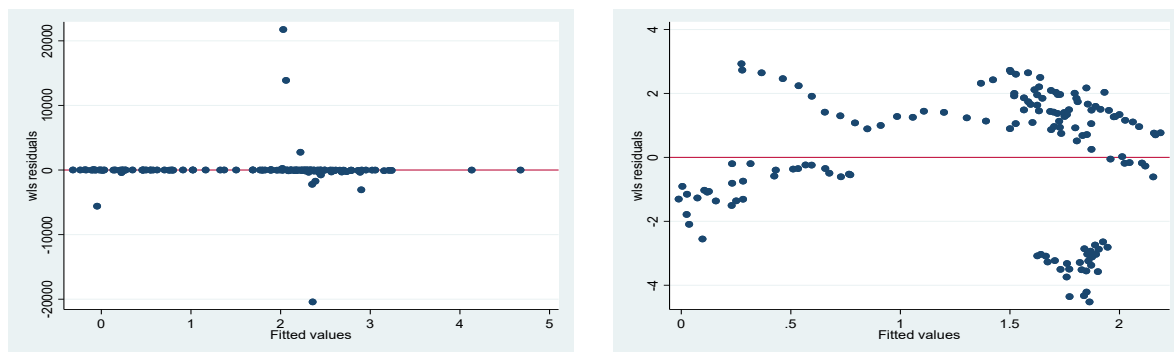


Figure 1. Weighted Least Squares Estimate Plots

Accordingly, the correlation between lnFdi (left) and Co2 appears strong. On the other hand, lnGdp (right) indicates a relatively weak and volatile relationship.

Table 4. SIV-QR and IV-2SLS Results

Dependent Variable: lnCo2	2SLS	SIV-QR				
		Q10	Q25	Q50	Q75	Q90
lnGdp	1.07 ^a	.68	.96 ^a	1.09 ^a	1.16 ^a	1.19 ^a
lnFdi	-.17 ^a	-.20	-.16	-.09 ^b	-.09 ^a	-.04 ^b
Constant	-7.49 ^a	-5.24	-6.74 ^a	-7.45 ^a	-7.79 ^a	-7.8 ^a
R ²	0.4130	---	---	---	---	---

Robust score chi2	59.16 [0.0000]	---	---	---	---	---
Robust regression F	181.32 [0.0000]	---	---	---	---	---
Endogenous R ²	0.7630 [0.0000]	---	---	---	---	---
Score chi2	27.202 [0.0000]	---	---	---	---	---

Notes: Q indicates quantiles. a, and b indicate $p < 0.05$, and $p < 0.01$, respectively. Employed for each estimator are exogenous regressors: lnFdi, endogenous regressor; lnGdp, excluded instruments; lnPop lnEu. We also used a robust version of the 2SLS, the VCE version, which confirmed the 2SLS results.

Table 4 presents the estimated coefficients. The SIV-QR findings show that for lnGdp, coefficients are intervals of 0.96 and 1.19 and positive and significant in all quantiles. Therefore, per capita income (lnGdp) leads to an increase in lnCo2. On the other hand, the lnFdi coefficients are -0.09 and -0.04, which is significant in the last three quantiles, indicating that lnFdi leads to a decrease effect in lnCo2. We used the 2SLS method to check the robustness of the SIV-QR findings.

In addition, the 2SLS results confirmed the SIV-QR findings. We also run several tests to determine the accuracy of our endogenous variables in the model. All the tests yielded similar results, so lnGdp is endogenous to the model and is instrumented with lneu and lnpop.

4.1. Robustness Check

We employed the simultaneous-quantile regression (sqr) method for the robustness check of the SIV-QR findings. Simultaneous quantile regression can report standard errors to obtain an estimate of the VCE via bootstrapping; the VCE includes between-quantile blocks. Thus, we can test the confidence intervals by comparing the coefficients with different quantiles.

Table 5. Sqr Results

Dependent Variable: lnCo2	Sqr				
	Q10	Q25	Q50	Q75	Q90
lnGdp	.29 ^a	.52 ^b	1.01 ^a	.97 ^a	.84 ^a
lnFdi	.09 ^b	-.19	-.06	-.10 ^b	-.11 ^a
Constant	-2.05 ^a	-3.6 ^b	-6.8 ^a	-6.28 ^a	-4.97 ^a
Pseudo R ²	0.3634	.2207	0.4432	0.3934	0.3492

Notes: Q indicates quantiles. a, and b indicate $p < 0.05$, and $p < 0.01$, respectively. Simultaneous quantile regression bootstrap is 100.

Table 5 presents the findings of the Sqr method, which has no endogeneity or exogeneity. The Sqr findings show that for lnGdp, coefficients are intervals of 0.29 and 1.01, positive and significant in all quantiles. On the other hand, the lnFdi coefficient is 0.09 on low quantile. Sqr findings show that FDI has a decreasing effect (negative) on low quantile unlike SIV-QR findings. On the contrary, FDI has a decreasing effect of the high quantiles of .75th and .90th on Co2.

Finally, we examine the FDI and Co2 relationships with the help of graphics. The plots in Figure 2 show the median regression with bootstrap standard errors (bsqreg). This implies that bsqreg is equivalent to Sqr with one quantile.

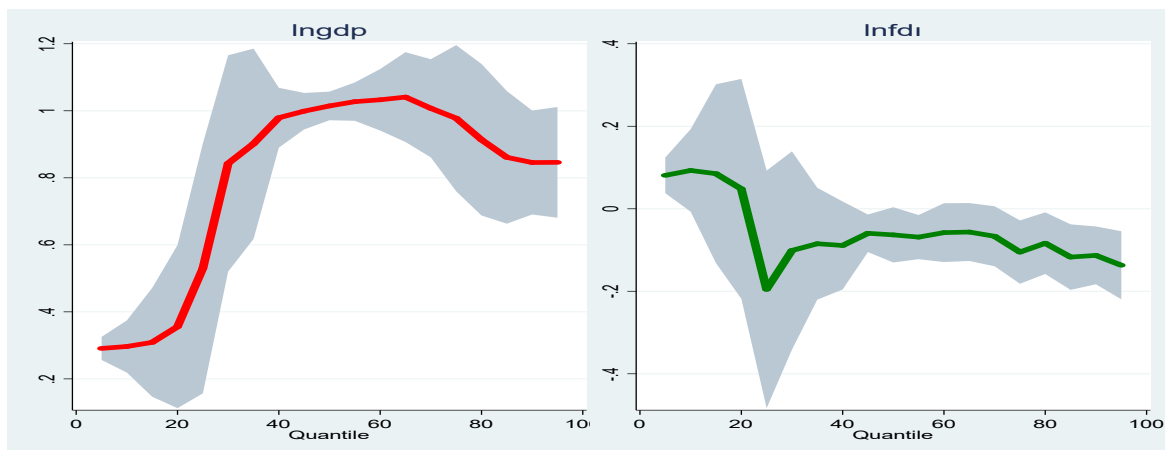


Figure 2: Bootstrap Standard Errors Plots

Figure 2 displays graphs of the quantiles, with the x-axis ordered from 0. to 100, and the vertical axes representing the effect variables. The red line indicates a positive coefficient for $\ln Gdp$ across all quantiles, while the green line $\ln Fdi$ has a negative effect on the low quantile, but turns positive on the 25th quantile. The first effect validates the pollution haven hypothesis for our sample in the low quantiles and the second effect implies the technological effect that reduces pollution in the high quantile.

4.2. Discussion

In this study, we use three estimators. Two of these were SIV-QR and IV-2SLS. SIV-QR neatly captures breaks in time and helps us consider interiority. In the model we created to investigate the effects of FDI on CO₂ emissions, per capita GDP was used as an endogenous variable and population and electricity consumption were used as instrumental data. Because our two main estimators, SIV-QR and IV-2SLS, use population and electricity consumption as instrumental data, their coefficients have not been calculated. In this regard, we can only compare the findings on FDI and per capita GDP with those in the literature.

From the GDP perspective; Bakhsh et al. (2017) investigated the effects of GDP on Co₂ for Pakistan using 3SLS in terms of technical and composition effects. Their findings showed that GDP has an increasing effect on Co₂ and reductions in GDP have a very limited effect on Co₂. Behera & Dash's (2017) findings on the positive effects of GDP on high and middle-income countries, and Khan & Öztürk's (2020) findings on the effects of GDP for 17 Asian Countries are consistent with our findings. On the other hand, the findings of Chang and Li (2018), Koçak & Şarkgüneşi (2018), Keho (2015), and Tang & Tan (2015), among the studies examining relationships in the context of the EKC model, show an inverse U-shaped relationship. Among these, only Chang and Li (2018) used a nonlinear method. Our findings, which are the bootstrap simultaneous quantile regressions, show that GDP draws an inverse U-shaped curve, but no coefficient that changes over time is negative. Accordingly, differing from the others, our findings show that the polluting effects of GDP decrease only in higher quantiles. In addition to, Mohsin et al. (2022) prove that short- and long-run effects differ regarding the GDP effect for developing countries.

From the FDI perspective; Bakhsh et al. (2017), Behera & Dash (2017), Sapkota & Bastola (2017), Chang & Li (2018), Koçak & Şarkgüneşi (2018), and Salahuddin et al. (2018), Muhammad & Khan (2019), Esendoh et al. (2020), Khan & Öztürk (2020), Aslan et al. (2021)'s findings showed the enhancing effects of FDI on Co₂ unlike to ours. Essendoh et al. (2020) found that GDP and FDI an increased effect on Co₂ for low-income countries and Balsalobre-Lorente et al. (2022) showed that FDI has increase effect on Co₂. Their EKC findings are inverse U shape relationship with GDP and GDP square and Co₂. However, the effects of FDI can change over time.

Our study differs from these studies in terms of the methods used. Most of these studies used methods that could capture only the long-term or both the short- and long-term effects of FDI on Co₂. However, our estimator is a quantile. Standard regressions which are the methods used in the studies above are often used to estimate the mean or expected values. However, quantile regression focuses on predicting certain percentages (quantiles) of a target variable. That is, the regression coefficients are calculated by focusing on the distribution in certain percentiles. This allowed us to understand the general trend as well as the changes in certain segments by examining the effects of the variables in the dataset at different percentages.

On the other hand, our findings are consistent with the findings of Keho (2015), Tang & Tan (2015), Behera & Dash (2017). Behera & Dash (2017) divide countries into income levels. Awan (2022) investigated the effects of FDI for ten emerging countries with panel moment quantile and the findings are compatible with ours in terms of FDI, but the author may have misinterpreted the plot of moment quantile for GDP. This is because all the moment quantile coefficients for GDP are positive. Although the findings are consistent with the general consensus for developing countries, the effects vary over time or effects that vary in different quantiles. The reason for this may be that some study models used are nonlinear or quantile estimators based on the EKC, which may affect the findings. Second, different findings may depend on the choice of variables, because there is no consistency in the literature regarding the representation of FDI.

5. CONCLUSION

While increasing environmental awareness in developed countries affects the location or amount of production geographically, the relatively weak environmental policies of developing countries attract pollution from other countries as well as domestically produced pollution. The realization of this process with foreign direct investment flows is expressed by the pollution haven hypothesis.

The pollution haven hypothesis refers to the evasion of environmental standards by shifting production activities to countries subject to less regulation and control due to the increase in the costs of economic activities in countries with stricter environmental regulations. Costs of clean production, in particular, force the production forces of the EU and developed countries to migrate in the context of net zero greenhouse gas emission targets in the fight against the climate crisis. The risk of the industry moving to less-regulated regions is possible due to strict environmental regulations in developed countries. Developing countries offer good opportunities for substitution with low environmental costs but high or at least productivity in the region of capital migration. For developing countries, this process means that foreign exchange inflows, employment increases, and technology transfers may be seen as opportunities, but their returns may not always be as expected.

This study investigated the effects of foreign direct investment flows and economic growth on carbon emissions based on 1992-2020 annual data for the five emerging economies (Brazil, Russia, India, China, and South Africa (BRICS)). Population density and electricity consumption were used as the instrumental variables in the novel panel smooth quantile regression. As a research method, we used the instrumental variables smooth quantile regression method, which is a novel method in panel econometrics. Our findings indicate the negative effects of FDI flows on Co2 in low quantiles and the positive effects of economic growth. We robust these findings using the instrumental variables of the two-stage least squares estimation, and confirm that our choice of operational variables is correct.

We cross-checked our findings using a different quantile estimator that does not consider exogeneity. Simultaneous quantile regression findings show that FDI has an increased effect in low quantiles, but this effect turns positive, similar to the instrumental smooth quantile findings. These findings show that in BRICS countries, the pollution haven hypothesis is valid in the low quantile. In addition, the findings imply that possibility emphasizes the reducing effects of investments in technology on pollution. In other words, technological effect in which direct foreign investment flows reduce pollution in the high quantile.

Based on our findings, we make two recommendations: one for policymakers and one for researchers. Policymakers should focus on long-term environmental policies rather than short-term growth plans. Second, our simultaneous quantile regression plot findings show a threshold value. Researchers may focus on this threshold value using threshold methods that consider nonparametric and nonlinear relationships between the variables.

Developing countries with direct foreign investment inflows must pay attention to the quality of foreign direct investment to increase their development by bringing in foreign investment. High-technology investments may have positive effects on development and the environment. However, it should be noted that the climate crisis is not a regional but a global phenomenon, not only for those who receive capital migration but also for those who provide capital migration. Finally, border carbon trading, a market-based approach to combating climate crises, may be strengthened and expanded to reduce the effectiveness of the pollution haven hypothesis. Achieving the 2030 global warming target and 2050 net zero greenhouse gas emission target is extremely important in the fight against climate crises.

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AUTHORS' DECLARATION

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AUTHORS' CONTRIBUTIONS

Writing - original draft, Conceptualization, Data curation, Formal analysis, Methodology, Software, Investigation, Visualization – **İÖ**, Writing - original draft, Writing -review & editing, Investigation, Visualization - **SB**.

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Social Network Use of Accounting Professionals in Accessing Professional Knowledge in Türkiye: The Case of Facebook

Türkiye'de Muhasebe Meslek Mensuplarının Mesleki Bilgiye Erişimde Sosyal Ağ Kullanımı: Facebook Örneği

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ABSTRACT

Keywords:

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Accountant,

Social Networking,
Facebook,

Web Scraping

Jel Codes:

C33 M40 M41 M49

Social networks, defined as virtual environments where people interact with other users using the internet, were first created for a group of university students to communicate with their schoolmates. Later, these networks were used for many different purposes, such as entertainment, news, advertising, product marketing and sales, education, and access to information on various topics. Professionals also create groups on these networks, share information with their colleagues in their field, and quickly access the information they need about their profession. Many people practicing accounting are also members of such groups on social networks. This study aims to examine the use of social networks by accounting professionals to access professional information. For this purpose, the groups actively used by accounting professionals were investigated using various keywords in social networks widely used worldwide and in Türkiye. After that, it was determined that the group with the most participants was on Facebook. This group was selected in the context of case study, one of one of the qualitative research techniques, and all the posts in this page were accepted as data. The web scraping method obtained 1,328 posts made in a specific time interval. These data were analyzed by content analysis method. In conclusion, it was confirmed that social networks were used by members of the accounting profession in order to access professional knowledge rather than social interaction.

ÖZET

Anahtar Kelimeler:

Serbest Muhasebeci Mali
Müşavir,

Sosyal Ağ,

Facebook,

Web Kazıma

Jel Kodları:

C33 M40 M41 M49

İnsanların interneti kullanarak diğer kullanıcılarla etkileşime geçtiği sanal ortamlar olarak tanımlanan sosyal ağlar, ilk olarak bir grup üniversite öğrencisinin okul arkadaşlarıyla iletişim kurması için oluşturulmuştur. Daha sonra bu ağlar eğlence, haber, reklam, ürün pazarlama ve satışı, eğitim, çeşitli konularda bilgiye erişim gibi birçok farklı amaçla kullanılmaya başlanmıştır. Bazı meslek mensupları da bu ağlar üzerinde gruplar oluşturarak kendi alanlarındaki meslektaşları ile bilgi paylaşımında bulunmakta ve meslekleri ile ilgili ihtiyaç duydukları bilgilere hızlı bir şekilde ulaşabilmektedir. Muhasebe mesleğini icra eden birçok kişi de sosyal ağlardaki bu tür gruplara üyedir. Bu çalışma, muhasebe meslek mensuplarının mesleki bilgiye erişmek için sosyal ağları kullanımını incelemeyi amaçlamaktadır. Bu amaçla dünya genelinde ve Türkiye'de yaygın olarak kullanılan sosyal ağlarda çeşitli anahtar kelimeler kullanılarak muhasebe meslek mensuplarının aktif olarak kullandıkları gruplar araştırılmıştır. Bunun ardından en çok katılımcının olduğu grubun Facebook'ta olduğu belirlenmiştir. Nitel araştırma tekniklerinden biri olan durum çalışması kapsamında belirlenen bu grup sayfasındaki tüm paylaşımlar veri olarak kabul edilmiştir. Web kazıma yöntemi ile belirli bir zaman aralığında yapılan 1.328 paylaşım elde edilmiştir. Bu veriler içerik analizi yöntemi ile analiz edilmiştir. Sonuç olarak muhasebe meslek mensuplarının oluşturdukları gruplar aracılığıyla sosyal etkileşimden ziyade mesleki bilgiye erişmek için sosyal ağları kullandıkları tespit edilmiştir.

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1. INTRODUCTION

Social networks are virtual environments where people interact with other users using the Internet. It is estimated that the number of users of these platforms, which a group of university students first created to communicate with their schoolmates, has reached 5 billion worldwide. Initially developed only for participants to interact socially, social networks are now used for various purposes, such as entertainment, news, advertising, product marketing and sales, education, and information on various topics. Many professionals also create groups on these networks and share information with their colleagues in their field of work. At the same time, thanks to these groups, they can access the information they need about their profession quickly. It is known that many people practicing accounting are members of such groups on social networks for social and professional purposes. This study aims to examine the use of social networks by members of the accounting profession in sharing and accessing professional information. For this purpose, various keywords were used on Twitter, Facebook, and Instagram, which are widely used worldwide and in Türkiye, to determine the largest and most active group of accounting professionals. As a result of this research, a group with more than 112 thousand members on Facebook, where new posts are made daily, and there is intense interaction, was identified. The number of members is not the only reason for choosing the group on Facebook. In other social networks, group members are not authorized to post directly on the group page. However, Facebook groups allow all participants to post on the group page. The posts made in this selected group and the interactions they received were accepted as data. By web scraping method, 1328 posts made in a certain period were taken and subjected to content analysis. As a result, it has been determined that members of the accounting profession use social networks intensively to access the professional information they need.

2. SOCIAL NETWORKS

Social media, which has changed the way people communicate in modern society, has expanded rapidly since its emergence and is used by people of all ages all over the world (O'Day et al., 2021: 1). Social media can be defined as environments where users create an online identity, content, and relational networks (Magro, 2012: 149). They are platforms where users interact by sharing information and accessing others' posts through various media (Men et al., 2021: 324). Some social media environments include blogs, e-mail groups, forums, and social networks (Özdemir et al., 2014: 59).

Being social creatures, people want to share their feelings, desires, happiness, hobbies, and interests. In the twenty-first century, people want to connect with others with similar interests locally and globally, despite living in a time-constrained world. It can be stated that social networks are essential tools in meeting these needs (Kumar et al., 2021: 843). Removing physical and cultural barriers, social networks are seen as fundamental elements for interpersonal relationships in much of the world. With billions of active users worldwide, social networks are social structures consisting of people connected through various relationships or common interests (e.g., professional relationships, friendship, and kinship) (Camachoa et al., 2020: 88).

According to a study, some of the reasons why people use social networks include keeping up with what friends are doing, following news and current events, to spend leisure time, finding funny or entertaining content, sharing photos or videos with others, sharing ideas, shopping and meeting new people (GWI, 2022). In addition, it can be said that social networks are also used extensively for different purposes, such as sharing and accessing information, collaborating and coordinating with colleagues, and finding jobs and employees (Oksa et al., 2021: 2304).

According to a report published in July 2022, social media platforms, whose number of users is increasing daily, have 4.7 million users worldwide. At the same time, Facebook is the social network with the most users, with 2.93 million (Datareportal, 2022). According to a report published in February 2022, the number of social media users in Türkiye has reached 68.9 million. The number of users of social networks was determined as 52.15 million on Instagram, 34.4 million on Facebook, and 16.10 million on Twitter (Recro Digital Marketing, 2022).

3. THE ACCOUNTING PROFESSION IN TÜRKİYE

The accounting profession in Türkiye is regulated by Law No. 3568 on Certified Public Accountants and Sworn-in Certified Public Accountants. This law divides accounting professionals into "Certified Public Accountants" and "Sworn-in Certified Public Accountants." As can be seen in Figure 1, the duties of Certified Public Accountants can be listed as bookkeeping, preparing financial statements, preparing declarations and related documents, establishing and developing accounting systems, providing consultancy on accounting, finance, legal legislation, conducting

examinations and audits on all these transactions, preparing reports and opinions on all these transactions, and leading expert witnessing.



Figure 1. Duties of Certified Public Accountants in Türkiye

Sworn financial consultants can do all these works except bookkeeping, opening an accounting office, or becoming a partner. However, the most crucial authorization given to them is to carry out attestation works on various issues. The general and special conditions of being an accounting professional are also determined in this law.

Members of the accounting profession need some information from time to time while practicing their work. They obtain the information they need from various sources. One of these sources is social networks. Through the groups created on social networks, members of the accounting profession can access the professional information they need in a very short time.

4. LITERATURE REVIEW

There are many studies in the literature on investigation of intended use of Facebook groups for purposes other than social interaction. In this section, some of these studies will be discussed.

Cain & Policastri (2011) investigated whether students could gain practical knowledge about their field from non-university experts through Facebook groups. As a result, they found that students could access information about real-life applications through Facebook groups. Meishar-Tal et al. (2012) aimed to determine the alternativensness of Facebook groups to learning management systems. They found that a Facebook group could be used as a tutoring site and that students were satisfied with the use of Facebook groups for this purpose. Wang et al. (2012) aimed to measure the use of a Facebook group as a learning management system and students' perceptions of it. As a result, they found that although there were some limitations, Facebook groups could be used as a learning management system, and students were generally satisfied with Facebook facilities. Pi et al. (2013) examined the factors that encourage Facebook Groups members' willingness to share information. They concluded that reputation would influence information sharing attitude and sense of self-worth would affect this attitude directly and indirectly. Ekoç (2014) examined the use of Facebook groups as a tool in language learning and she found that Facebook groups could be used as a supportive and enhancing tool in language learning because of their benefits. Ping & Maniam, (2015) investigated the effect of Facebook groups on the writing skills of the newly learned language in their study. As a result of their research, they found that students who participated in Facebook groups performed better in writing. Miron & Ravid (2015) examined using Facebook groups as an alternative way to learning management systems as closed environments. They used Facebook groups to teach 12 courses. As a result, they found that both students' and educators' perspective on using Facebook groups in learning were positive. Abedin et al. (2017) examined the usability of Facebook groups in educating and informing patients with foot problems associated with diabetes. They determined the existence of active groups used by diabetic patients using various keywords on Facebook. They reported that doctors, nurses, and charitable organizations could inform these patients and their caregivers about foot care through these groups. Yıldırım (2019) investigated the support of teachers' professional development through the Facebook groups. In the group examined within the scope of the research, it was determined that teachers informed each other on many issues, such as field

knowledge, pedagogical knowledge, education and training processes, resource sharing, and personal rights, and supported their professional development. Yaşar & Arı (2023) examined Turkish teachers' use of Facebook groups for professional development. They used the case study technique, one of the qualitative research methods in the research. As a result of the analysis of the selected posts, they determined that Turkish teachers used Facebook groups to support professional development and to offer suggestions in this field.

5. METHODOLOGY AND FINDINGS

Social networks, which were established to provide various social interactions between users, are now used for many different purposes besides their purpose of existence. One of these purposes is to access professional information. Various professionals share professional knowledge with their colleagues through the groups they create on social networks. Accounting professionals also use social networks intensively for this purpose.

5.1. Aim of this Study

This study examined accounting professionals' social network usage level in accessing professional knowledge. At the same time, it aimed to determine the subjects on which the most experienced knowledge was desired.

5.2. Method and Scope of this Study

The groups actively used by members of the accounting profession were investigated using various keywords on Twitter, Facebook, and Instagram, which are widely used worldwide and in Türkiye. In this research, the keywords "accounting," "accountant," "accounting profession," "independent accountant," and "financial advisor" were used. Thus, it was tried to determine the group with the most participants and actively used. Depending on the keywords, many accounts and groups created for professional knowledge sharing for accounting professionals in social networks were identified. The statements and groups with the most members and the most actively used ones were identified for this study. As a result, the group on Facebook, which was established in 2009 by independent accountant financial advisors, where mostly accounting professionals are members, new posts are made daily, and there is constant interaction, was selected as a single case within the scope of the research. Another reason to choose a group from Facebook is that group members are not authorized to post directly to the group page on other social networks. Facebook groups, however, allow all participants to post on the group page. A case study is a qualitative research technique in which comprehensive data about the research topic are obtained through observation, interview, audio-visual materials, and documents about one or more situations in real life. The results are presented with themes and descriptions (Creswell, 2013: 99). In this study, the posts made in the group selected as a case study and the interactions these posts received were accepted as data. As of the moment the data set was taken, the group members were 111,911 (as of 20.09.2022 - 23:59). Not all group members are certified public accountants. Members include those practicing accounting under different titles, interns, students, and academics. Data from the relevant group were obtained by the Web scraping method.

Web scraping is a technique for extracting unstructured data from websites. Thanks to this technique, this unstructured raw data can be stored in an organized manner and transformed into an analyzable format. Web scraping can be considered as one of the data preprocessing steps in the data mining process. It consists of the following three sequential steps (Thomas et al., 2019: 452):

- Obtaining raw HTML data from websites
- Implementation of Web scraping techniques on HTML data
- Storing the structured data in an understandable and analyzable file type.

As a result of these steps, extracting targeted information from website data is integral to decision-makers' effective decision-making processes.

This study obtained data from the group above on Facebook using Python programming language and an auxiliary web scraping program specially prepared for this research. A total of 1,328 posts shared between 20.08.2022 00:47:42 and 20.09.2022 23:11:36 were analyzed. The total interaction (likes and comments) was received by these posts is 28,458.

The data were subjected to content analysis and descriptive analysis. Content analysis is an analysis method in which the data are analyzed, and those with similar aspects are classified; codes to express these classifications, categories, and themes that these are connected to are created (Sönmez & Alacapınar, 2014: 98). Descriptive analysis is the presentation of statistical information about research results to summarize the data (Balçı, 2013:

229). In this study, themes and codes were created, and frequency distributions were presented based on the posts made by accounting professionals in the Facebook group within the scope of the research through content analysis.

5.3. Findings

As a result of the content analysis of the data, four categories and three themes related to these categories were formed. These themes are social posts, job postings, and professional knowledge posts. The results are presented in Figure 2. The themes show the type of posts made in the group, and the categories show the details. The frequencies next to the categories indicate the number of posts in each category.

Figure 2 shows that most of the posts are related to professional knowledge. Based on this theme, which corresponds to 84.4% (1,121 posts) of the total posts, two categories were formed: information and question.

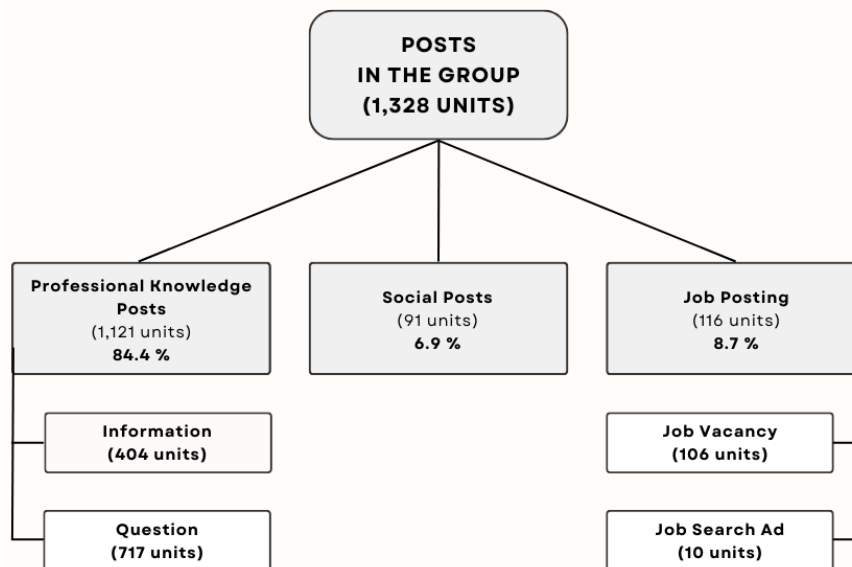


Figure 2. Themes and Categories Created with the Posts

The information category included posts by professional members on various topics, such as professional developments, practices, and new regulations. Conversely, the question consisted of posts to obtain information from colleagues on issues related to their profession that they could not solve, encounter for the first time, or are subject to new regulations. The other theme created in this research was social posts. This theme, which corresponded to 6.9% (91 posts) of the total posts, consisted of posts related to religious and national holiday celebrations, condolence wishes, fun content, and information about the group. The third theme created in the research is job postings. This theme, which corresponded to 8.7% (116 posts) of the total number of posts, had two categories: job vacancy postings and job search postings. The group had 106 job vacancy posts and 10 job search posts.

The posts received 28,458 interactions. Of these interactions, 17,863 were likes, and 10,595 were comments. The type, frequency, and percentage distribution of interactions by groups are shown in Figure 3.

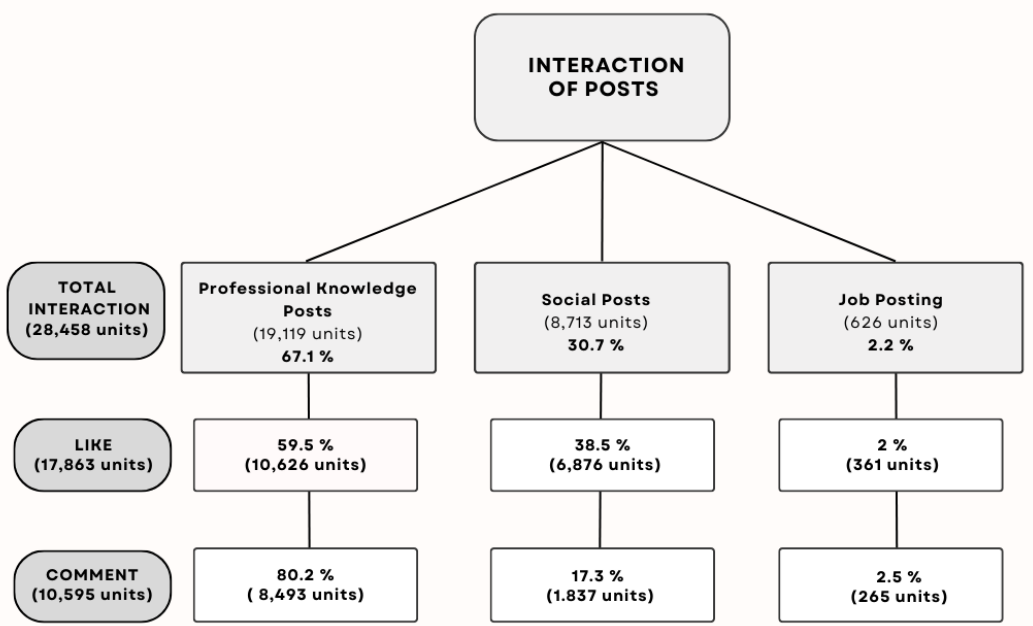


Figure 3. Distribution of Posts Interactions According to Themes and Codes

As shown in Figure 3, 67.1% (19,119) of the total interaction was received by professional knowledge posts, 30.7% (8,713) by social posts, and 2.2% (626) by job postings. When we looked at the distribution according to the types of interaction, the theme that received the most likes and comments was similarly professional knowledge posts.

The codes, frequency distributions, and percentages of the question category created based on the theme of professional knowledge posts to determine the topics the profession's members would most like to obtain information about, which is the study's second objective, are shown in Figure 4.

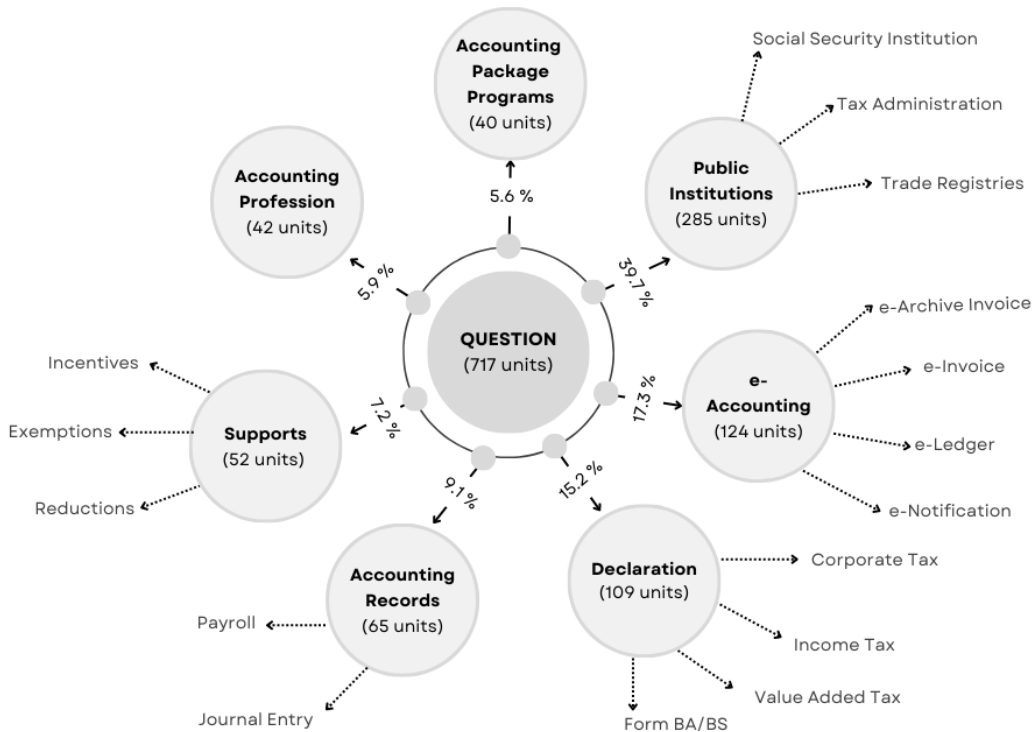


Figure 4. Topics on which Professionals Would Like to Obtain Information

When Figure 4 is analyzed, it was seen that the questions asked by the members of the accounting profession to obtain information from their colleagues through their posts were mostly related to public institutions. In this study, 285 (39.7%) of the 717 posts grouped under the "question" code are related to public institutions, such as social security institutions, tax administration, and trade registries. This code was followed by the e-accounting code with 124 posts (17.3%). The number of posts related to the regulations under the category of asking questions

was as follows: declaration 109 (15.2%), accounting records 65 (9.1%), supports 52 (7.2%), accounting profession 42 (5.9%) and accounting package programs 40 (5.6%).

The findings showed that 288 (22%) of the total 1328 posts in the group did not receive any interaction. In the question category, where 717 posts were included, 73 posts (10%) received no interaction.

All posts made in the group were labeled with the name "post," and in the order of date and time they were made. Depending on the code titles, posts related to the codes that made up the question category would be presented.

Some of the posts related to the public institution's code were as follows:

"The employee retired. Then we hired him. Will his annual leave be 14 days. Or will it continue for 26 days?" (Post 145, Date: 23.08.2022, Time: 22:12:13, 21 Likes, 55 Comments)

"Good day friends, the retired employee has entered the work with the wrong code, his pension has been cut, how should we proceed?" (Post 160, Date: 24.08.2022, Time: 11:13:05, 24 Likes, 28 Comments)

"We omitted to notify the Social Security Institution of a worker's termination of employment. He left his job on XX.XX.2022. Foreign worker and resigned. Should we make his exit to XX.XX.2022 and show the time in between as unpaid leave, or how do you recommend me to follow a path? How many penalties will we be subjected to if we check out late." (Post 260, Date: 26.08.2022, Time: 00:07:20, 26 Likes, 43 Comments)

Some of the posts regarding the e-accounting code were as follows:

"The taxpayer, who has an e-invoice, passed pos 50.000 TL from July but forgot to cut the invoice. What can we do in this case?" (Post 100, Date: 22.08.2022, Time: 19:23:16, 35 Likes, 47 Comments)

"If we delete and re-upload the sixth-month e-ledger, how can we delete the second copy we sent" (Post 480, Date: 31.08.2022, Time: 01:43:31, 24 Likes, 18 Comments)

"Friends, a net 2000 lira invoice will be issued; I wonder if the e-archive is mandatory" (Post 745, Date: 6.09.2022, Time: 19:05:51, 37 Likes, 54 Comments)

Some of the posts regarding the declaration code were as follows:

"I am an income taxpayer. We bought the land four years ago and built a 3-story villa on the land in 2021. Now we are selling it. The municipality's market value is 620.000 TL. We are selling it for 3.000.000 TL. Will we declare an increase in value?" (Post 155, Date: 24.08.2022, Time: 09:32:04, 10 Likes, 16 Comments)

"Hello, we just realized that the form BA/BS for June 2022 has not been submitted. Does it make sense to approve it on this date or not to approve it at all" (Post 273, Date: 26.08.2022, Time: 10:18:16, 16 Likes, 35 Comments)

Some of the posts related to the accounting records code were as follows:

"My pharmacy taxpayer deducted a turnover premium to the pharmaceutical warehouse. Can I assign it to normal sales in account no? 600 and exit account no. 320?" (Post 219, Date: 25.08.2022, Time: 10:31:52, 16 Likes, 39 Comments)

"On XX.XX.2022, I received a salary attachment letter of 2000 TL for the personnel I entered on XX.XX.2022. What should I do?" (Post 1264, Date: 19.09.2022, Time: 12:15:06, 13 Likes, 85 Comments)

Some of the posts related to the supports code were as follows:

"I received an error notification in incentive 27103 due to the average number of workers. How should I edit this, what should I do?" (Post 5, Date: 20.08.2022, Time: 06:18:29, 18 Likes, 22 Comments)

"Is there a problem if an incentivized worker is dismissed from the employer at the end of the incentive period and receives unemployment benefits?" (Post 666, Date: 5.09.2022, Time: 00:00:36, 20 Likes, 22 Comments)

Some of the posts related to the accounting profession code were as follows:

"Hello, we will make a contract with the taxpayer we have agreed with, but another financial advisor's contract is in e-union. He cannot be reached. What do you think should be done in this case? (Post 11, Date: 20.08.2022, Time: 10:31:41, 5 Likes, 22 Comments)

"Hello masters, can a professional working as an insured person keep books? (Post 1245, Date: 18.09.2022, Time: 22:16:29, 13 Likes, 46 Comments)

Some of the posts related to the accounting package programs code were as follows:

"Hello friends, I want to create a quick receipt in LUCA (accounting package program). I couldn't. If you have sample receipts, could you share your quick receipt definitions?" (Post 124, Date: 23.08.2022, Time: 13:40:29, 8 Likes, 7 Comments)

"Hello, chocolate production company uses ZIRVE (accounting package program) and wants to switch to another program because it cannot get support from ZIRVE. What would be your program recommendation?" (Post 845, Date: 09.09.2022, Time: 01:04:34, 25 Likes, 130 Comments)

6. CONCLUSION

Social media tools, first used for social communication, now serve many purposes. One of these purposes is to obtain information. This study aims to determine for which purpose the groups in social networks are used intensively by the members of the accounting profession and what subjects they want to obtain professional information most. For this purpose, the group with the most members on social networks was determined, and the group members' posts were accepted as data. The 1,328 posts made in the group with approximately 112 thousand members on Facebook were analyzed. As a result of this analysis, it was determined that members of the accounting profession used this group mostly for sharing professional knowledge posts (84.4% - information and questions). However, there were also job postings (8.7%) and social posts (6.9%) during the research period. Members of the accounting profession can obtain the professional information they need while practicing their work from many sources. Examples of these sources include legal regulations, academic publications, publications of professional chambers, and obtaining information from colleagues through classical methods (such as telephone or face-to-face interviews). However, it can be time-consuming to research and access information on a specific topic from these sources. Compared to these sources, social networks are essential tools for accessing professional information because they allow quick access to multiple colleagues simultaneously. The results of this study also confirm this feature of social networks.

This study also aimed to determine the topics on which accounting professionals would most like to obtain professional information. As a result of the analysis performed for this purpose, it was determined that they mostly want to receive information by asking questions about public institution transactions. The prominent institutions are the social security institution, tax administration, and trade registries—the second most common questions related to electronic accounting applications like e-invoice and e-ledger. Thirdly, there are questions regarding the organization of declarations in the posts shared by the profession's members. When the 717 posts included in the question-asking code were analyzed, it was seen that the questions were generally answered. 90% of these questions received interaction can be considered an indicator of this.

This study analyzes accounting professionals' use of social networks to access professional knowledge through a single example. As a result, it was determined that they used social networks intensively both in sharing professional knowledge and in accessing data by asking their colleagues about situations they did not know about or had encountered for the first time. Using social networks for this purpose can be considered an innovative and essential professional approach. The fact that the research was conducted on a single sample can be expressed as a limitation of the investigation. In further studies, more than one sample can be examined simultaneously, and the results can be compared. In addition, using social networks to access professional information can be measured directly by accounting professionals with qualitative or quantitative methods.

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AUTHORS' DECLARATION

This paper complies with Research and Publication Ethics, has no conflict of interest to declare, and has received no financial support.

AUTHORS' CONTRIBUTIONS

Conceptualization, writing-original draft, editing – **IC and RC**, data collection, methodology, formal analysis – **IC and RC**, Final Approval and Accountability – **IC and RC**.

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