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# An Examination of the Opportunities and Challenges of Conversational Artificial Intelligence in Small and Medium Enterprises

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## ABSTRACT

This study **aims** to examine the potential benefits and challenges associated with conversational artificial intelligence (CAI) implementation within small and medium enterprises (SMEs). The study employs a comprehensive literature review and thematic analysis as the primary data collection and interpretation **methods**. CAI technologies are examined, including chatbots, virtual assistants, and automated response systems. These technologies offer SMEs opportunities to automate customer service operations, gain valuable customer insights, and enhance operational efficiency. However, their integration also presents technical difficulties, financial constraints, data privacy and security concerns, and inherent CAI limitations. The study **results** provide a nuanced understanding of CAI's role in SMEs, offering insights into practical applications, potential benefits, and hurdles. The **findings** highlight SMEs' need to strategically approach AI implementation, balancing the potential benefits and associated challenges. The **key conclusion** drawn from this study is that the strategic and well-planned adoption of CAI can significantly benefit SMEs. However, it should be viewed as an augmentation of existing operations rather than a complete replacement. This study also identifies the need for future research, particularly empirical studies examining the implementation of CAI in SMEs and exploring its long-term impacts and ethical implications.

**Keywords:** artificial intelligence (AI); conversational AI (CAI); small and medium enterprises; SME; digital business; digital transformation; AI implementation; literature review

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ОРИГИНАЛЬНАЯ СТАТЬЯ

# Исследование возможностей использования и проблем разговорного искусственного интеллекта на малых и средних предприятиях

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## АННОТАЦИЯ

**Целью** данного исследования является изучение потенциальных преимуществ и проблем, связанных с внедрением разговорного искусственного интеллекта (РИИ) на малых и средних предприятиях (МСП). В качестве основных **методов** получения и интерпретации данных в исследовании используются комплексный обзор литературы и тематический анализ. Рассматриваются технологии РИИ, включая чат-боты, виртуальные помощники и системы автоматического ответа. Эти технологии предоставляют МСП возможности автоматизировать операции по обслуживанию клиентов, получать ценную информацию о клиентах и повышать операционную эффективность. Однако их интеграция также сопряжена с техническими



трудностями, финансовыми ограничениями, проблемами конфиденциальности и безопасности данных, а также с присущими РИИ ограничениями. **Результаты** исследования представляют подробное описание роли РИИ в МСП, возможностей практического применения, показывают потенциальные преимущества и препятствия использования РИИ. Результаты исследования подчеркивают необходимость стратегического подхода МСП к внедрению РИИ с учетом потенциальных преимуществ и сопутствующих проблем. **Основной вывод**, сделанный на основе данного исследования, заключается в том, что стратегическое и хорошо спланированное внедрение РИИ может принести значительную пользу МСП. Однако РИИ следует рассматривать как дополнение к существующим операциям, а не как их полную замену. Данное исследование также определяет необходимость проведения будущих научных работ, особенно эмпирических исследований, посвященных внедрению систем РИИ в МСП и изучению их долгосрочного влияния и этических последствий для организаций.

**Ключевые слова:** искусственный интеллект (ИИ); разговорный ИИ (РИИ); малые и средние предприятия; МСП; цифровой бизнес; цифровая трансформация; внедрение ИИ; обзор литературы

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## 1. Introduction

The continuous advancement of artificial intelligence (AI) technology, particularly conversational AI (CAI), has significantly transformed various aspects of our lives and industries. The role of AI in the modern economy has grown exponentially over the past decade, driven by advancements in computing power, data availability, and machine learning algorithms. As a result, AI systems, including CAI, have become increasingly adept at performing a wide range of tasks, such as natural language processing and decision-making support [1]. The integration of this technology across various sectors has offered large corporations a competitive edge and now holds the potential to revolutionise the operational dynamics of small and medium-sized enterprises (SMEs), creating avenues for growth and innovation despite distinct challenges. The global conversational AI market, valued at USD 6.18 billion in 2021, is expected to exhibit a compound annual growth rate (CAGR) of 23.6% between 2022 and 2030, highlighting this technology's increasing adoption and potential [2].

However, the impact of AI on SMEs has been less pronounced, with many smaller organisations needing help to keep pace with the rapid developments in AI technology [3]. This is due, in part, to the high costs associated with AI implementation, as well as the specialised knowledge and resources required to develop and maintain AI systems [4]. Moreover, SMEs often need more scale and resources to effectively leverage AI for competitive advantage, as they typically operate on smaller budgets and with fewer personnel than their larger counterparts [5].

The potential advantages and challenges of CAI technology for business advancement remain to be explored. This research attempts to answer critical questions about the potential benefits for SMEs when implementing CAI technologies and the challenges SMEs might face when incorporating CAI into their operational structures.

This research focuses on the application of conversational AI (CAI) within the operations of SMEs, emphasising potential challenges and risks. It aims to enrich the existing literature by offering a comprehensive examination of CAI's effects on SMEs, a subject that has yet to be thoroughly investigated. Moreover, it extends its contribution by delivering actionable insights and implications that can assist SMEs in successfully integrating conversational AI into their businesses. For instance, SME owners can leverage these insights to enhance their understanding of CAI implementation, promoting business growth [10]. Simultaneously, these findings can serve as a resource for government entities, guiding the development of policies to improve the SME sector and mitigating any negative impacts stemming from AI technology [11].

## 2. Literature review

### 2.1. Conversational artificial intelligence (CAI)

CAI refers to using artificial intelligence technology to enable natural language interactions between machines and humans through natural language interfaces [12]. Initially emerging as text-based interfaces, CAI has since expanded to incorporate other forms of communication, including voice

and image interactions. Examples of this evolution include text-based general conversational AI such as ChatGPT and customer service chatbots. Voice-activated assistants, such as Siri or Google Assistant, represent another facet of this development. Furthermore, image-based conversational tools such as visualGPT exemplify the broadening scope of CAI, demonstrating its capacity to interact through various mediums. In this context, CAI serves as an interface for AI technologies. It comes in multiple forms, such as chatbots, virtual assistants and automated response systems, and needs to be further defined in the context of CAI. Chatbots are AI software designed to interact with humans using natural language. These interactions can occur on various platforms, such as websites, social messaging platforms, and via text or voice [13, 14]. An automated response system refers to a system that utilises automation to generate responses or perform tasks without human intervention. It can be part of a more extensive automation system or operate independently [15, 16]. In the context of CAI, it refers to an umbrella term for chatbots and virtual assistants designed to interact with users and provide information or assistance without human intervention [17, 18].

Conversational AI has seen considerable evolution since its inception. The origins of conversational AI can be traced back to the 1960s with ELIZA, a simple rule-based system developed at the Massachusetts Institute of Technology (MIT) that mimicked a psychotherapist [19]. PARRY followed this in the 1970s, which simulated a person with paranoid schizophrenia, marking an early attempt to model human conversation more realistically [19]. The 1990s saw the advent of more sophisticated systems, such as Artificial Linguistic Internet Computer Entity (ALICE), which used heuristic pattern matching to hold conversations and won the Loebner Prize. In the 2000s, with the advent of the internet and improvements in computational power and data availability, conversational AI began to include machine learning and natural language processing capabilities. The current era of conversational AI, characterised by deep understanding and neural networks, started in the 2010s. This has led to the development of advanced systems [20], such as OpenAI's GPT-3.5 and Google's Meena. Today's CAI, powered by generative AI capabilities, can generate human-like text and understand the context using Natural Language Programming (NLP). This

makes them increasingly versatile tools for content generation, customer service, personal assistance, and more [21, 22].

CAI has become increasingly important in business due to the emergence of big data and advancements in computing power [23]. CAI can potentially transform various aspects of business, including digital marketing, customer service, and commerce [24]. Organisations can better understand their customers and deliver personalised digital messages [23]. CAI can also drive business model innovation by developing new and innovative business models [25]. It has been widely used in industries such as tourism and hospitality, where conversational agents empowered by AI are becoming more common [26]. The application of conversational AI can significantly impact the customer experience and reduce service costs [27]. Overall, conversational AI has the potential to enhance business performance, improve customer engagement, and enable informed decision-making [28, 29].

## 2.2. Role of CAI in business context

The role of AI in business contexts has attracted substantial attention in recent academic literature. Studies have consistently underscored the potential of AI to revolutionise various aspects of business operations, such as enhancing productivity, augmenting decision-making capabilities, and enriching customer service experiences [23, 25, 30–35]. CAI has been shown to empower decision-making processes by providing valuable insights and recommendations based on data analysis [30, 31, 36]. It has also been found to contribute to business model innovation and the transformation of industries [23, 25]. Additionally, CAI can potentially improve customer service experiences through personalised recommendations and solutions [36]. However, it is essential to consider the limitations and challenges associated with CAI, such as biases and ethical implications [33, 35]. Overall, the academic literature highlights the significant impact of AI on various aspects of business operations and emphasises the need for further research in this area.

## 2.3. CAI implementation case in SMEs

CAI implementation in small and medium-sized enterprises (SMEs) presents a unique set of opportunities and challenges, a topic that has recently gained prominence in scholarly litera-



ture. Due to their size and flexibility, SMEs can often adopt new technologies faster than larger enterprises, allowing them to stay competitive and innovative [37]. AI has been identified as a significant driver of operational efficiency in SMEs. A study by Von Garrel and Jahn [38] demonstrated how AI could streamline operations in SMEs by automating repetitive tasks and providing predictive insights, thereby freeing up human resources for more strategic tasks. CAI has also been shown to enhance decision-making in SMEs by providing data-driven insights and recommendations [39]. In summary, while the literature on CAI implementation in SMEs is still emerging, existing studies underscore its potential benefits and the need for strategic approaches to overcome associated challenges.

### **3. Method**

This study uses a literature review and thematic analysis as the primary research method. The method relies on a comprehensive review of secondary data sourced predominantly from academic journals, industry reports, and articles available on the Internet [40]. The aim of this study is to obtain a broad and deep understanding of the use, benefits, and challenges of implementing CAI in SMEs. The data collection process involves the use of specific search terms related to our research questions, such as “Conversational AI”, “SMEs”, “AI adoption”, “challenges”, and “benefits”, among others. Databases such as Google Scholar, IEEE Xplore, and ScienceDirect will be used to source peer-reviewed articles. Journals chosen as review sources were assessed based on their relevance to the research question, with the author’s judgement based on their title and abstract. After that, it will be analysed further for content. While websites such as Medium, Towards Data Science, and Forbes will provide insights from an industry perspective. Information regarding CAI implementation in large companies was also collected to provide a broader context of the potential application of CAI to SMEs’ business functions.

Data analysis will include coding and categorising the collected information according to our research questions and theoretical framework. Coding refers to assigning labels to data that represent themes or categories such as “benefit”, “challenges”, “implementation”, and “limitation”. Categorising refers to grouping based on coded data. A thematic

analysis will identify recurring patterns and themes across the literature [41]. The synthesised results will then be interpreted in line with our theoretical basis, providing a comprehensive view of the implications of CAI technology for SMEs. This secondary research methodology enables us to consolidate and analyse various perspectives and findings. However, it is essential to be aware of the potential for bias and critically evaluate the sources’ quality and relevance.

## **4. Results and discussion**

### **4.1. Implementation and benefit of CAI in SMEs**

Deploying conversational AI technology has benefited SMEs across diverse sectors [42]. This transformative technology has been instrumental in reshaping the operational landscape of these businesses, offering a wide array of advantages beyond mere cost savings. CAI has emerged as a crucial enabler for SMEs to access knowledge and capabilities once reserved for large corporations with substantial resources.

One of the most compelling features of CAI is its ability to generate content dynamically by utilising generative AI. This capability, powered by state-of-the-art machine learning models, has opened up many opportunities for SMEs. The most powerful feature supported by generative AI technology, is that CAI could create content from scratch, such as marketing materials and strategy [43, 44], generate insightful reports [45] and write business emails. This allows SMEs to manage various functions with little to no costs, matching the capabilities of their larger counterparts. The outcomes from such generative AI models closely resemble content produced by humans, as they are trained using a vast array of data. These models can be tailored to carry out particular tasks, such as creating slides following a specific style, composing marketing campaigns targeted at a particular demographic, providing commentary for online gaming, and generating high-resolution images [46]. CAI can be leveraged for tasks that require programming, as it can generate code based on user prompts. This allows users with minimal programming skills to execute tasks that traditionally require significant coding knowledge, such as creating digital materials such as websites or applications. For budget-conscious SMEs, this could be a game-changer. CAI aids users

by suggesting code, resolving programming-related queries, and guiding problem-solving processes [47]. Its natural language processing capabilities enable it to comprehend and produce code, making it a valuable resource for users [48]. Additionally, CAI can assist with code documentation, create code snippets, and explain programming concepts [49]. With the advent of CAI, these expenses can be significantly mitigated.

Moreover, these AI-driven systems have been pivotal in providing valuable customer insights. By analysing customer interactions, SMEs can better understand customer behaviour, preferences, and needs [55]. For instance, an online retail business can use chatbot interactions to identify common customer inquiries or complaints, helping them proactively address these issues. This data-driven approach allows SMEs to tailor their products and services more effectively, increasing sales and customer retention. According to the customer relationship management (CRM) theory, understanding and responding to customer needs is critical to building long-term customer relationships and driving business growth [56]. By leveraging CAI, SMEs can implement CRM strategies more effectively, using the insights gained from customer interactions to deliver personalised experiences and build customer loyalty. In addition, CAI has also played a significant role in internal business operations. It has enabled SMEs to automate routine tasks, allowing employees to focus on more strategic, value-adding activities. For example, a small tech company could use a CAI to automate scheduling meetings or managing project timelines, allowing their team to focus more on product development and innovation [57]. Furthermore, the scalability of CAI systems has been particularly beneficial for SMEs. As these businesses grow, the CAI systems can easily be scaled up to handle increased customer interactions without significant additional investment. For instance, as an e-commerce business expands its customer base, it can scale up its CAI capabilities to drive increased customer inquiries without hiring more customer service staff [58].

Overall, the advent of CAI has levelled the playing field, allowing SMEs to access capabilities and knowledge previously out of their reach. By effectively utilising CAI, SMEs can enhance their operations and improve their competitive position in the market.

## 4.2. Implementation challenge and limitations for SMEs

While CAI presents many opportunities for SMEs, it is also full of challenges. There are several considerations that SMEs must address when implementing, maintaining, and managing the externalities of AI. Certain inherent limitations of CAI have been identified, which may pose potential concerns for SMEs compared to large corporations.

### 4.2.1. Technical challenges

SMEs may need help integrating these AI systems with their IT infrastructure [59, 60]. This process requires a certain level of technical expertise to ensure seamless integration and operation. Furthermore, maintaining and updating these systems to keep up with advancements in AI technology can be a daunting task for SMEs that may need a dedicated IT team. SMEs could implement CAI on a smaller scale, which does not require massive integration with the IT structure. SMEs' key advantage over larger businesses is their simpler IT infrastructure. This simplicity lowers the barriers to AI implementation, especially when using licensed or outsourced services. These standalone services are known for their ease of integration and minimal learning curve for employees. They offer a straightforward way for SMEs to enhance their customer service capabilities using AI. This service also provides consultation and assistance service during implementation to help SMEs.

### 4.2.2. Financial constraints

Financial limitations often pose a significant challenge for SMEs. The initial financial investment required to integrate conversational AI systems can be substantial. Software acquisition, system integration, and employee training costs can present a significant financial hurdle in adopting these innovative systems [61, 62]. The price of CAI software and integration may vary depending on the complexity and performance of the CAI. The integration cost may range from \$ 1000 to \$ 2000 per conversational AI agent [62]. Early adoption of conversational AI will be mainly driven by large organisations with sufficient budget and technical resources. Furthermore, the ongoing financial demands for system maintenance and upgrades can strain the limited resources available to SMEs.

Financial hurdles can be eased through judicious scaling of the business. SMEs can identify crucial

business needs across their business lifecycle and prioritise AI solutions based on their return on investment. The advantages of AI should be tracked over time, with the anticipation that the profits generated from its deployment will, in time, exceed the initial and sustained costs.

#### 4.2.3. Data privacy and security concerns

Using conversational AI systems, which often handle sensitive client information, inherently raises data privacy and security concerns. SMEs must ensure that these systems comply with data protection laws, maintain high data security standards, and protect customer information to maintain trust [63]. Deviations from these standards can lead to legal repercussions and significant damage to the company's reputation. Additionally, these systems are not impervious to cybersecurity threats; a notable example being the exploitation of these systems by malevolent entities to procure sensitive user data [64].

Addressing data privacy and security concerns is vital, particularly for CAI systems handling sensitive customer data. SMEs can consider AI services that adhere to data protection laws and invest in training their employees on data security protocols. Furthermore, integrating privacy considerations into every process — a strategy often referred to as 'privacy by design' — can help ensure robust data protection measures are in place from the outset.

#### 4.2.4. Limitations of CAI

Despite the considerable advances in conversational AI, it's essential to recognise its potential shortcomings. Primarily, the creative capabilities of CAI can be a double-edged sword, posing challenges to the reliability and accuracy of the system. Contemporary research typically presents objective metrics on test sets. Still, it may quickly and justifiably discount any poor performance, attributing it to the system's creative language generation compared to the ground truth responses. Instead, they rely on crowd-sourced reviews as a qualitative metric for evaluating model performance [65]. Utilising the current iteration of CAI for tasks demanding high precision and consequences in information generation, such as healthcare diagnosis, legal counsel, or safety-critical systems, carries a degree of risk. As a result, the outputs from CAI should be treated as advisory and supporting data rather than absolute truths that serve as the sole

basis for decision-making. Moreover, CAI should be leveraged to enhance, not replace, human interaction and critical thinking [66]. CAI also poses challenges in comprehending the subtleties and intricacies of human language. These limitations include but are not limited to reliability, semantic variations, colloquialisms, and culturally specific linguistic nuances, which pose formidable challenges to the accurate interpretation of language by AI models [67].

*Table 1* illustrates the multifaceted implications of CAI across a spectrum of business operations. Although not all applications have been adopted within the SME landscape, the table delineates many potential opportunities for integrating such technologies within this sector.

While AI implementation has many challenges, its benefits greatly outweigh them. From streamlining processes to assisting in decision-making across all business functions, AI may become an indispensable business tool for gaining a competitive edge. Despite initial obstacles such as cost, technical complexity, and privacy concerns, businesses that successfully harness the power of AI can transform their operations and customer experiences. With AI, they can automate repetitive tasks, freeing up human resources for more strategic, high-value work. This increases efficiency and boosts employee satisfaction by allowing them to focus on more creative and fulfilling tasks. In decision-making, AI-powered analytics can give businesses unparalleled insights into operations, market trends, and customer behaviour. These insights allow companies to make data-driven decisions, reducing guesswork and enabling them to respond more quickly to changes in the market. Therefore, while adopting AI may present particular challenges, its strategic integration into business functions can provide significant advantages. It is crucial, however, for businesses to approach AI implementation thoughtfully and strategically, carefully considering their specific needs, resources, and potential risks and rewards.

#### 4.3. Future research direction

While the existing literature provides valuable insights into the potential benefits and challenges of CAI for SMEs, it also highlights several areas where further research is needed. Our synthesis of the literature suggests the following critical areas for future exploration (*Table 2*).

Table 1  
Practical implications of CAI across business functions

Practical implementation	Benefit	Potential challenge
	<b>Customer service</b> [42, 52, 53]	
Responding to customer inquiries	Reduces response times from a few minutes to a few seconds. Cutting costs up to 30%	Resistance from employees due to fears of job loss
AI for complaint resolution	Boosts customer satisfaction	The balance between AI and human support
	<b>Sales and marketing</b> [68–70]	
Using CAI to qualify leads	Supports lead generation	High upfront costs
Personalised marketing messages	Improves customer engagement	Managing data privacy concerns
	<b>Human resources</b> [71, 72]	
Automating initial interviews	Streamlines recruitment processes	Requires reorganisation of existing workflows
Answering questions about company policies	Improves new hire onboarding	Managing employee's perceptions towards AI
Scheduling interviews	Reduces administrative work	Ensuring AI reliability
	<b>Operations and supply chain management</b> [39, 73, 74]	
Chatbots tracking inventory levels	It makes businesses more efficient	Data privacy concerns
CAI provides real-time updates on shipment status	Enhances customer-centric operations	Coordinating AI with human decision-making
	<b>Finance</b> [75–78]	
CAI provides financial advice	Empowers customers with financial knowledge	Managing customer trust in AI handling financial transactions. Reliability of information

Source: Developed by the author from various sources.

### 5. Conclusion

The advent of CAI has ushered in a new era of digital transformation, offering many opportunities for SMEs to enhance their operational efficiency, improve customer satisfaction, and gain a competitive edge in the market. However, the implementation of this transformative technology has its challenges. Technical difficulties, financial constraints, data privacy and security concerns, and the inherent limitations of CAI are some of the potential hurdles that SMEs may encounter in their AI journey. Therefore, SMES must adopt a strategic approach towards AI implementation, considering these potential chal-

lenges and devising effective strategies to mitigate them. Despite the challenges, the potential benefits of CAI for SMEs are immense. By automating routine tasks, providing valuable customer insights, and enhancing customer service, CAI can significantly contribute to the growth and competitiveness of SMEs. However, SMEs must understand that CAI is not a panacea for all their challenges. Instead, it should be viewed as a tool to augment their existing capabilities and help them achieve their business objectives.

Future research could focus on exploring the long-term impacts of CAI on SMEs, including its effects on employee roles and responsibilities, or-



Table 2  
Future research areas

Key questions	Research gap	Type of studies needed to answer the question	Future research recommendation
How does industry influence the impact of CAI?	Need for industry-specific analyses	Comparative studies across different sectors	Researchers should focus on individual industries, identifying unique opportunities and challenges
	Only some comprehensive studies explore all facets of a specific industry	Deep dives into each sector, investigating the entire value chain	Researchers could consider the whole spectrum of industry operations to identify how AI could add value
How does the size of the SME influence the implementation and outcomes of CAI?	Lack of differentiation in studies based on the size of the SMEs	Comparative studies on small versus medium-sized enterprises.	More nuanced studies considering the size and resource availability of SMEs are required
	Inadequate exploration of the impact of resource availability on AI implementation	Correlation studies between resource availability and successful AI integration	Studies should consider the role of resources in enabling or hindering AI adoption
What are the perceptions and attitudes of employees towards CAI?	There needs to be more consideration of the employee perspective	Surveys, interviews, and ethnographic studies to gauge employee attitudes and acceptance	An in-depth exploration of the employee's perspective, including attitudes, fears, and adaptability, is needed
	Neglected exploration of strategies for improving employee acceptance	Case studies on successful employee engagement with AI	Strategies for fostering positive employee engagement with AI should be identified and evaluated
What are the best methodologies or tools for integrating CAI into existing SME operations?	Scarcity of practical guides or methodological studies	Case studies, design research, and action research focusing on the practical implementation of AI	Researchers should aim to provide experimental methodologies, frameworks, and tools for SMEs transitioning to AI
	Minimal investigation of the processes for training and educating SMEs about AI	Exploratory and evaluative studies of AI training and education programs.	Research should focus on developing and evaluating practical AI training and education for SMEs

Source: Developed by the author.

organisational structure, and business strategy. Additionally, empirical studies examining the implementation and use of CAI in SMEs could provide valuable insights into this technology's practical challenges and benefits. Furthermore, the research could also explore the ethical implications of CAI, including issues related to data privacy, security, and the potential for AI to perpetuate and amplify socio-cultural and racial biases.

In conclusion, this research has significantly contributed to the literature on AI and SMEs. This study has provided a comprehensive analysis of the implications of conversational AI for SMEs and offered practical insights to guide their adoption and use of this technology. These contributions fill a gap in the existing literature and provide valuable information for business owners, managers, and policymakers.



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# Investments in the Regions as a Factor of Russia's Economic Growth

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## ABSTRACT

Investing in the economy of the Russian Federation as a whole and in its regions in particular is a task of paramount importance because the well-being of both the state itself and its citizens will depend on its proper execution. This determines the **relevance** of the research topic. Investments in the regions are aimed at increasing the regional product and production volumes, mastering new activities, and developing the existing material and technical base. The **subject** of this study is the investment climate in certain Russian regions. The **purpose** of the study is to analyze investments in Russia and its individual regions and assess their dynamics, development trends and state policy to improve the investment climate. Investments in the regions will help eliminate the uneven development of the regions and turn depressed subjects into donor entities. The **scientific novelty** lies in the analysis of the investment climate of the Russian Federation and the factors influencing the volume of investments in the regions. The article presents the current state of the investment climate in the two regions of Russia. A modern interpretation of investments is given. Two regions of Russia – Kaluga and Kaliningrad – are considered as examples of actively developing investment regions. The prospects for investment activity and possible problems due to the imposed sanctions are noted. As part of the study, the authors used **methods** for analyzing statistical data and official documents. Based on the **results** of the analysis, it was revealed that despite the high investment potential of the regions, many economic indicators have a negative tendency. It was **concluded** that improving the investment climate as well as active state participation will allow Russia to achieve completely different results of economic growth in the long term.

**Keywords:** investments; regional investments; economic growth; Kaluga region; Kaliningrad region; GDP; investment projects; COVID-19

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ОРИГИНАЛЬНАЯ СТАТЬЯ

# Инвестиции в регионы как фактор экономического роста России

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## АННОТАЦИЯ

Инвестиции в экономику Российской Федерации (РФ) в целом и в ее регионы в частности, являются задачей первостепенной важности, поскольку от правильности ее реализации будет зависеть благополучие как самого государства, так и его граждан. Это и обуславливает **актуальность** темы исследования. Инвестиции в регионы направлены на увеличение регионального продукта, наращивание объемов производства, освоение новых видов деятельности, развитие имеющейся материально-технической базы. **Предметом** исследования является инвестиционный климат на примере отдельных российских регионов. **Цель** исследования – провести анализ инвестиций в России и двух ее регионах, оценить их динамику, тенденции развития и государственную политику по улучшению инвестиционного климата. Инвестиции



в регионы помогут устранить неравномерность развития регионов и превратить депрессивные субъекты в субъекты-доноры. **Научная новизна** состоит в анализе инвестиционного климата РФ, а также факторов, оказывающих влияние на объем инвестиций в регионы. В статье представлено актуальное состояние инвестиционного климата двух российских регионов. Дана современная трактовка инвестиций. Рассмотрены две области России – Калужская и Калининградская как активно развивающиеся инвестиционные регионы. Отмечены перспективы инвестиционной деятельности, а также возможные проблемы ввиду наложенных санкций. В рамках исследования авторами использовались **методы** анализа статистических данных и официальных документов. По **результатам** проведенного анализа было выявлено, что, несмотря на высокий инвестиционный потенциал регионов, многие экономические показатели имеют отрицательную динамику. Авторами сделан **вывод** о том, что улучшение инвестиционного климата, а также активное государственное участие позволят России достичь совершенно иных результатов экономического роста в долгосрочной перспективе.

**Ключевые слова:** инвестиции; региональные инвестиции; экономический рост; Калужская область; Калининградская область; ВВП; инвестиционные проекты; COVID-19

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## Introduction

The concept of “investment” originates from the Latin word “invest”. In a broader interpretation, this term means capital investments with a view to increasing them in the future in order to compensate the investor for the refusal to use the funds available to him in the current period and losses from inflation. Investments are usually understood as cash, securities, including property rights, having a monetary value, invested in objects of entrepreneurial and/or other activities to make a profit and/or achieve another beneficial effect.<sup>1</sup>

Investments are one of the most effective ways to increase capital and grow a business. There are several types of investments that have their own characteristics: exchange, budget, foreign, as well as investments from the own funds of enterprises. In this article, we will consider mainly the last two types to finance various projects in the regions, that is, state financing, for example, the construction of roads, bridges, schools, etc., and investments of own funds in various projects that can make a profit.

Investments in the regions are one of the key factors in Russia's economic growth. They have the potential to create a ripple effect, generating employment opportunities, boosting local industries, and fostering innovation and infrastructure

development. By channeling investments into the regions, the government aims to achieve more balanced and sustainable economic growth across the country, reducing disparities between metropolitan areas and regions.

This topic holds particular importance in the Russian context as the country strives to diversify its economy and reduce its dependence on natural resources. The regions offer vast opportunities for investment in various sectors, including manufacturing, agriculture, tourism, technology, and infrastructure development. By attracting investments in the regions, Russia aims to unlock their growth potential, encourage entrepreneurship, and foster economic resilience.

## Literature review

In modern economic literature, the topic of the impact of investments in the regions on Russia's economic growth is widely discussed. One of the works on this theme was carried out by A. V. Novikov in 2021 [1]. In his work, he revealed that investments in the regions can help accelerate economic growth in the country. However, for investments to be effective, it is necessary to create a favorable investment environment in the regions.

In 2016, I. K. Rodin studied the investment climate in Russian regions and its impact on economic growth [2]. He argues that a favorable investment climate, characterized by transparent regulations, efficient governance, and infrastructure development, is crucial for attracting investments in the regions. The author

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<sup>1</sup> Federal Law “On Investment Activities in the Russian Federation Carried Out in the Form of Capital Investments” (as amended by Federal Laws No. 22-FZ of 02.01.2000, No. 122-FZ of 22.08.2004, No. 9-FZ of 02.02.2006).

also highlights that the lack of these factors hinders investment inflows, leading to slower economic growth, and emphasizes the need for regional governments to implement policies that promote a conducive investment climate to stimulate economic growth.

Other researchers also emphasize the importance of creating a favorable investment climate in the regions. Thus, N. Y. Nabatova (2020) [3] notes that for investments to be effective, it is necessary to ensure the stability of the economic and political situation in the regions. She also emphasizes the importance of developing the technological base of the regions and ensuring the availability of high-quality educational services.

A. N. Savrukov, in his work “Assessment of the state and level of development of public-private partnership projects in the subjects of the Russian Federation” (2020) [4], examined the current situation and progress of public-private partnership (PPP) projects in the regions of Russia. The author finds that many projects are carried out through concessions at the municipal level in communal areas. After analyzing project data, it is determined that the structure of projects is unbalanced, with central regions receiving more funding and the transport sector accounting for a significant portion of financing.

A. K. Gergaeva, in her article “Investments and investment attractiveness as factors of sustainable regional development” [5], writes about the role of investments in facilitating sustainable socio-economic development in the regions. The author notes that investments, as a fundamental economic component, hold significant influence within the framework of commodity-money relations at macro, micro, and meso levels. The attractiveness of investments and the associated risks are integral elements in shaping an effective regional investment policy. Investment endeavors within any federal subject entail a range of risks, including financial, environmental, economic, social, criminal, political, administrative, and legal factors. In this article, the author analyzes various aspects of this multifaceted issue.

### Materials and methods

This scientific work aims to examine the role of investments in promoting economic growth

in Russia, with a particular focus on two investigated regions: the Kaluga region and the Kaliningrad region. The research methodology adopted for this study involves a comprehensive analysis of secondary data sources. This data will be collected from various sources, including government reports, statistical data, academic journals, and industry publications, which will provide relevant information on the economic indicators, investment flows, infrastructure development, and sector-specific data for the Kaluga and Kaliningrad regions. A comparative analysis will be conducted to assess the differences and similarities in investment patterns and economic growth between these two regions.

The materials from the Federal State Statistics Service of Russia were used as an information base.

The findings of this study will contribute to the existing body of knowledge on the role of investments in regional economic growth in Russia, with specific insights from the Kaluga and Kaliningrad regions. The research methodology outlined above will provide a robust framework for conducting a comprehensive analysis of the investment landscape and its impact on economic development in these two regions.

### Results and discussion

The investment climate in the modern sense demonstrates the extent to which the state of the economy and other indicators in a particular area affect investment in a given country. The economic definition of investment today is the use of capital by third-party companies or states to make a profit by the owner of the capital.<sup>2</sup>

In accordance with the Federal Law “On investment activities in the Russian Federation carried out in the form of capital investments”, investments should be understood as investing capital or carrying out specific work to create profit or obtain other benefits for the owner of capital, respectively.<sup>3</sup>

<sup>2</sup> Investments — Wikipedia. URL: <https://ru.wikipedia.org/wiki/Investments> (accessed on 20.06.2023).

<sup>3</sup> On investment activities in the Russian Federation, carried out in the form of capital investments: fed. the law was adopted by the State Duma of the Russian Federation on 15.07.1998; approved by the Federation Council of the Russian Federation on 17.07.1998. Official Internet portal of legal informa-

Table 1  
 Classification of factors influencing the investment climate

Classification of the trait	Factors of investment attractiveness
Cause of occurrence	External and internal factors
Relationship with human activity	Objective or subjective
The direction of the impact	Favorable or unfavorable
Duration of influence	Long-term, medium-term, short-term
Predictability	Expected and sudden
Importance	Influential and non-influential
Controllability	Adjustable or unregulated
The degree of intensity of change	Factors that can change with rapid intensity, medium or low
Expression methods	Quantitative or qualitative
Components of investment	Risks and potential of investing in this region

Source: Vlasenko R.D., Stroganov A.V. Foreign Direct Investment as a Factor in the Growth of the Russian Economy [6].

Today, the importance of involving regions in solving problems of both economic and social nature is increasing. For more successful financing of the federal budget, it is necessary for investment assets to be attracted to the regions by increasing investment attractiveness [6].

Experts identify many factors that affect the volume of investments in the country and its attractiveness for capital in general, and they show the risks for companies in the state's economy. They are usually divided into the groups presented in *Table 1*.

The investment climate of the region is assessed using the following items:

1. Gross regional product
2. Consumption of certain economic goods by the population
3. The region's export volume
4. Possibilities of the regional budget
5. Analysis of financial performance over the past few years
6. The volume of imports of economic goods
7. Financial deficit.

Factors subject to rapid change include legislation at the local level, policy at the state, regional and municipal levels in relation to

investment programs. Moderately urgent factors include the legal regulation of investment activities, whereas long-term factors include the entire infrastructure of the region, socio-cultural, as well as political spheres and the general economic situation in the region.

It can be concluded that the above classification of factors of investment activity allows us to analyze the current situation in the region in relation to various spheres of public life and gives the state the opportunity to increase the investment attractiveness of the region by correcting problematic factors, and makes it clear to the investor whether it is worth investing in the region or whether it is better to refrain from this action.

According to available information, the Kaluga region is among the leaders in several directions at once. So, it is in this region that the largest output of the industrial area is observed, as well as a significant share in the processing sector. Over the past 10 years, the Kaluga region has received many investment projects that have been able to develop industry in this region and create new enterprises.<sup>4</sup>

The following positive factors have been identified that have a direct impact on the develop-

tion. URL: <http://base.garant.ru/12114699/> (as amended on 03.07.2016).

<sup>4</sup> Investment portal of the Kaluga region. URL: <https://invest-kaluga.com/> (accessed on 20.06.2022).

Table 2  
The volume of investments in fixed assets of the Kaluga region

Year	2019	2020	2021	2022
Volume of investments in fixed assets (RUB bln)	112.0	95.9	114.9	88.8

Source: Investment portal of the Kaluga region. URL: <https://investkaluga.com/> (accessed on 20.06.2023).

ment of investment activities in the region. They are detailed below.

One of these factors is the real estate potential of the region, which is formed by the transport and logistics infrastructure and the level of its development [7]. In the Kaluga region, five federal highways have been built, and the length of railways is about 1000 km.

The second factor is the economic and geographical potential, which consists of the location of the region in relation to raw materials, useful resources, water opportunities and the consumer market. The Kaluga region is in the heart of a huge consumer market, where more than a third of the country's population lives. In addition, the presence of transport routes that connect Russia with all countries of the world and proximity to the capital are also important since it is the main market for goods.

The third factor is the administrative and managerial potential, which shows how well the personnel are selected in various departments of the administration and how efficiently and effectively they are able to make decisions. In the Kaluga region, an individual approach is applied to each project, as well as the presence of regional development institutions, which greatly simplifies the procedure for registering a business, obtaining licenses, permits and approvals.

The innovative potential of the region, which consists of the use of the latest achievements in scientific and technological progress, is the fourth factor. Location of production facilities in 12 industrial parks and at two sites of the "Special Economic Zone" in Lyudinovo and Borovsk. Any of these entities is a fully prepared land plot with all the necessary infrastructure and communications: electricity, gas, water and treatment facilities. The focus on the cluster development of the region is also taken into account, and in the Kaluga region there is a huge production of cars and automotive components, metalworking, pharmaceuticals, biotechnology and biomedicine

("KFK" Association)<sup>5</sup>; building materials. In addition, nuclear, medical, and digital technologies that can be used to solve problems in the medical field, the nuclear industry, in the development and manufacture of new materials, will become the basis of the Innovative Scientific and Technological Center "Park of Nuclear and Medical Technologies" being created in Obninsk.

It is also necessary to monitor the annual dynamics of funds raised in the regions, including foreign ones, to understand whether investment preferences have changed or remained at the same level. We chose this period in order to compare the volume of investments before the start of the COVID-19 pandemic, during the pandemic, and after. In addition, considering 2022, we were able to analyze the impact of the conflict between the Russian Federation and Ukraine on the inflow of investment funds to the region. *Table 2* shows the volume of investments into the Kaluga region over the past 4 years.

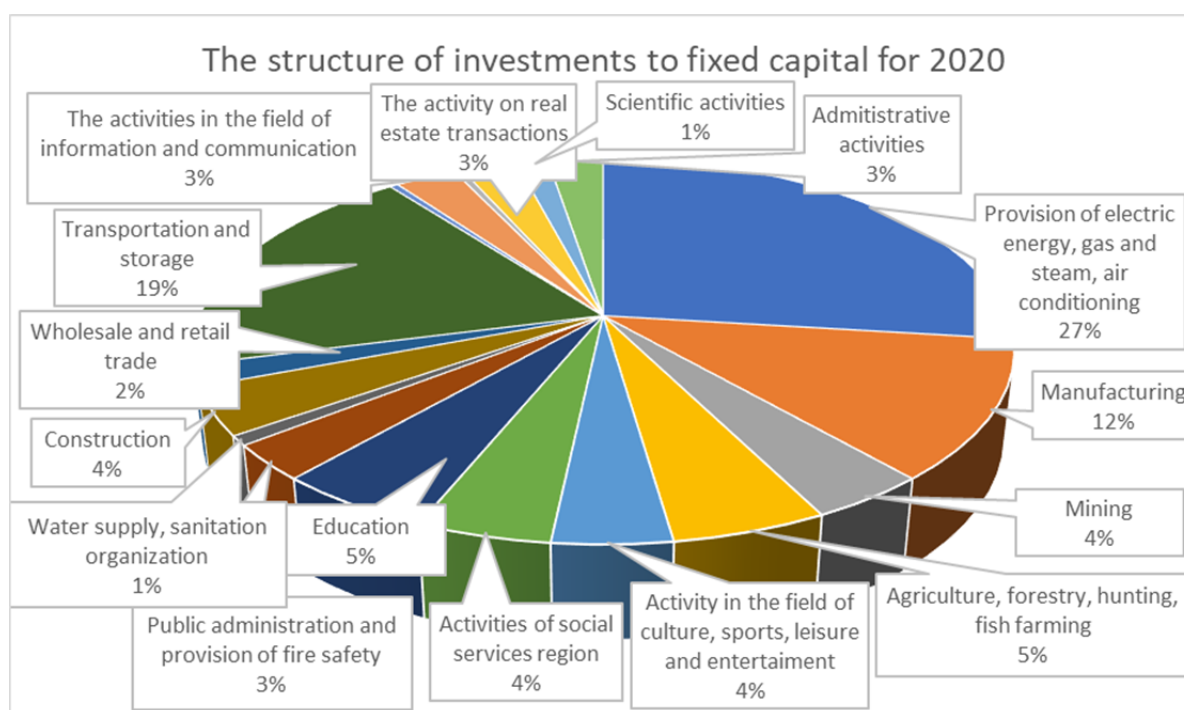
As we can see, in 2020, investments in fixed assets of the Kaluga region decreased compared to the previous year. This was caused by the COVID-19 pandemic, which affected the economic situation around the world. Many investors became more cautious and did not take the risk of investing in new projects.

However, in 2021, the situation began to improve. The Kaluga region has demonstrated a high level of fight against coronavirus. In addition, many pharmaceutical companies appeared on the market, which also attracted the attention of investors looking to re-invest.

In 2022, investment in fixed assets decreased again, especially foreign ones, which is associated with a special military operation in Ukraine. Foreign companies began to leave the Russian market, which had a negative impact on the economic situation in the region.

<sup>5</sup> Association "Kaluga Pharmaceutical Cluster". URL: <https://www.pharmclusterkaluga.ru/> (accessed on 20.06.2022).





**Fig. Structure of investments in fixed assets in the Kaliningrad region for 2020**

Source: Compiled by the authors.

**Table 3**  
*The volume of investments in the Kaliningrad region*

Year	2019	2020	2021	2022
Volume of investments in fixed assets (RUB bln)	103	97.5	83.8	88.2

Source: Federal State Statistics Service. URL: <https://rosstat.gov.ru/> (accessed on 20.06.2023).

Now, it is worth considering the attractiveness of the Kaliningrad region. Since 2016, almost 600 billion rubles have been attracted to this region in the form of foreign investment.

At the end of 2020, in the structure of investments of large- and medium-sized organizations by sources of financing, not including small businesses and funds raised outside the methods that are supervised, own funds accounted for 57.1%, borrowed funds — 42.9% of the total volume of investments in fixed assets, including the largest share — 25.6% were budget investments. The structure of investments in fixed assets of the Kaliningrad region is presented below (Fig.).

As we can see, at the end of 2020, investments in the provision of electricity, gas and steam, air conditioning had the largest share in the total volume of investments in fixed assets of large and medium-sized organizations, which amounted to 27.1%.

To compare the volume of investments in the two regions, we also used data for the Kaliningrad region in the period 2019–2022 (Table 3).

After analyzing the investment activities in the Kaliningrad region, it can be concluded that this market has potential. However, due to its geographical location, underdeveloped infrastructure and complete dependence on the “mainland”, this region has become unattractive for foreign investment. The sanctions imposed on Kaliningrad in 2014, namely, the abolition of the free customs zone and countersanctions on certain groups of goods, also affected. All of the above problems need to be solved if the leadership of this region wants to ensure a constant flow of foreign funds.

The conflict between Russia and Ukraine does not allow investments in the regions, and Russia as a whole, to not only increase, but even to remain at the same level. The economic sanctions have led to the suspension of the



activities of many transnational corporations in Russia. However, the main problem is that companies that are ready to continue working in our country refuse to invest in the Russian economy, which forces the suspension of a huge number of projects, and even state support will not be able to close the entire outflow of foreign investment [8].

It is also worth noting that for many years, the main investors in the Russian Federation were the United States and Germany, which invested in 26 projects from 2019–2021 and ranked first on the list of countries actively investing in the Russian economy. But, as it is known, both countries are leaders in the number of sanctions imposed, which will also deal a blow to investment activity in our country. Apparently, the vacant places will be taken by companies from other countries of the world, for example, from the Asian region, but in this regard, there are a number of problems that will not allow insufficiently large and developed corporations to create or increase their presence in our country — for many years they included high regulatory barriers and rather slow economic growth for a country with such a degree of economic development.

Huge difficulties may arise in the field of high-tech production, as well as medicine and pharmaceuticals, because the main suppliers of products for these areas have stopped deliveries, or generally frozen business in our country. Therefore, these areas may become the most unprofitable in the near future, because it is hardly possible to quickly find a replacement for suppliers or start production of missing elements. Another area that will certainly suffer from Western sanctions is metal mining, as there are many companies in our country and sales markets that were mainly focused on the West, which used them in a variety of areas, from consumer goods such as jewelry to materials necessary to create technological products.

This problem is already beginning to weaken the purchasing power of the population, which will reduce consumer demand and withdraw a fairly large amount of funds from the national economy.

To attract investments in the regions, it is necessary to develop infrastructure, create good conditions for business, improve the quality of

life of the population and ensure the stability of the economic and political situation.

It is also important to develop national investments to reduce the dependence of regions on foreign investors. To achieve this, it is essential to create favorable conditions for the growth of domestic companies and to attract investments from state funds and banks [9].

To stimulate domestic investment, the state can provide tax incentives and subsidies, as well as create special investment funds and programs to support small- and medium-sized businesses. It is also important to improve the investment climate in the country, simplify the procedures for registering and licensing a business, as well as ensure the protection of investors' rights [10].

Public-private partnership (PPP) is one of the most effective tools for attracting investment in the regions. In PPP, the state and the private sector combine their resources and competencies to implement joint projects. This allows for the distribution of risks between partners and increases the efficiency of the use of public and private resources [11].

Examples of PPPs in the Kaluga region include the construction of a logistics center by “Rusagrotrans” together with the regional government and the creation of the “Kaluga Forest” amusement park by “Russian Attractions” with the support of the regional authorities. In the Kaliningrad region, a PPP was created for the development of tourism “the Baltic Tourist Center” company, together with the regional government, is building a hotel complex on the seashore and developing resort infrastructure [12]. As a result of such cooperation, the investment potential of the regions increases, and their economic growth increases.

However, for the successful implementation of PPP, it is necessary to consider the interests of all parties, ensure transparency and openness of processes, and guarantee social responsibility and sustainable development of projects.

As for the areas for investment, each region has its own characteristics and potential for the development of certain industries. For instance, the Kaluga Region has high potential in the automotive and electronics industries, while the Kaliningrad Region — in the development of port infrastructure and tourism. According to the Association of Tour Operators of Russia, the

demand for tours to the Kaliningrad region in the current season has slightly decreased compared to last year.<sup>6</sup> This happened due to the complex logistics caused by sanctions and changes in the flight paths of Russian aircraft. The closure of airports in southern Russia also had a negative impact on the flow of tourists from the southern regions of the country. Last year, the number of visitors to the Kaliningrad region reached a record level of about two million people. However, this year, due to the difficult political and economic situation, the figures, according to local tour operators, decreased by 5–10%. In 2023, it will be available for visitors from other regions of Russia to unleash the potential of tourism in the east of the Kaliningrad region. In May 2022, the region received funding of 198.5 million rubles from the federal budget for the development of hotel infrastructure, the creation of modular campsites and national tourist routes.

### Conclusions

In general, investing in the regions of Russia can be profitable and promising, but requires

<sup>6</sup> Association of Tour Operators. URL: <https://www.atorus.ru/> (accessed on 20.06.2022).

serious analysis and risk assessment. It is important to consider all the factors that may affect the investment situation in the regions and create favorable conditions for businesses and investors, including economic, geographical and innovative potential.

Regarding the investment attractiveness of the two investigated regions, the Kaluga region becomes the obvious favorite to attract more funds due to its favorable geographical location, well-developed infrastructure, as well as a clear regulatory framework. The Kaliningrad region still faces a significant number of problems, including its geographical location and underdeveloped infrastructure that need to be analyzed and solved. Only by eliminating them, Kaliningrad will be able to become an attractive region for foreign investment.

Overall, understanding the significance of investments in the regions as a factor of economic growth in Russia is crucial for policymakers, investors, and all stakeholders involved in shaping the country's economic future. By harnessing the potential of the regions and encouraging investments, Russia can achieve sustainable and inclusive growth while unlocking the untapped potential of its diverse territories.

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# Macroeconomic Variables and Non-Performing Loans of Banks in Nigeria

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## ABSTRACT

The banking sector holds immense importance in any economy. However, the non-performing loans of Nigerian banks are a concern for the economy and financial stability. This can be attributed to the effects of macro-economic factors on banking activities in the country. The **study aimed** to examine macroeconomic variables and the non-performing loans of banks in Nigeria. A descriptive research **design method** was used for the study. Secondary data were collected for the period from 1990 to 2021. The auto regressive distributed lag (ARDL) error correction **model** was used for data analysis. The study's **results** show that tax revenue, recurrent expenditures and the real interest rate will in the long run resolve the problems of non-performing loans of banks in Nigeria. Contrarily, money supply and exchange rate, if not properly managed, may amplify non-performing loans of banks in Nigeria. The **study concluded** that macroeconomic variables, when properly devised, will help subdue the problem of increasing non-performing loans in Nigeria.

**Keywords:** non-performing loans; macroeconomic factors; banks; financial stability; inflation; Nigeria; ARDL; GDP

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ОРИГИНАЛЬНАЯ СТАТЬЯ

# Макроэкономические показатели и просроченные кредиты банков в Нигерии

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## АННОТАЦИЯ

Банковский сектор имеет огромное значение для любой экономики. Однако неработающие (просроченные) кредиты нигерийских банков вызывают беспокойство за экономику и финансовую стабильность, что может быть связано с влиянием макроэкономических факторов на банковскую деятельность в стране.

**Целью** данного исследования стало изучение взаимосвязи макроэкономических переменных и проблемных кредитов банков Нигерии. Для исследования использовался описательный **метод**. Вторичные **данные** были получены за период с 1990 по 2021 г. Данные были проанализированы с использованием модели авторегрессии и распределенного лага (ARDL). **Результаты исследования** показывают, что налоговые поступления, текущие расходы и реальная процентная ставка в долгосрочной перспективе решают проблему неработающих кредитов банков Нигерии. В то же время денежная масса и обменный курс, если ими не управлять должным образом, могут усилить негативное влияние неработающих кредитов. В результате исследования был сделан **вывод** о том, что макроэкономические факторы при правильном подходе помогут сгладить проблему роста неработающих кредитов в Нигерии.

**Ключевые слова:** неработающие (просроченные) кредиты; макроэкономические показатели; банки; финансовая стабильность; инфляция; Нигерия; ARDL; ВВП

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## 1. Introduction

The banking sector holds immense importance in any economy, serving as a crucial lifeline. Banks play a pivotal role by channeling funds from surplus units to deficit units, infusing vital financial support into the economy [1]. Through this fundamental function, banks actively contribute to the development of the economy. A study [2] shows that over the past two decades, the banking landscape has witnessed notable transformations, resulting in a well-established banking system worldwide in recent years.

The increase in non-performing loans (NPLs) poses a serious threat to the financial performance of banks, as it negatively impacts both their profitability and their ability to facilitate financial transactions (intermediation capacity). As highlighted in [3], a large volume of non-performing loans in the banking system can lead to bank failures. Considering that the banking industry is a crucial pillar of the economy, any shock to this sector would undoubtedly have ripple effects on the overall financial system and the economy as a whole. Moreover, a high level of non-performing loans jeopardizes the stability of the banking industry itself, as it can significantly affect the banks' profitability [4]. Therefore, it becomes imperative to closely monitor and address the lending portfolio of banks to mitigate potential risks and maintain the stability of the banking sector. Safeguarding the health of the banking industry is of utmost importance, given its pivotal role in supporting economic growth and development.

In Nigeria, NPLs experienced a significant decline from Q4'18 until Q1'20 [5]. However, starting in 2020, they began to rise consistently. This can be attributed to a considerable portion of the Nigerian banking sector being controlled by the private sector. As a result, banks may be more reluctant to extend loans to investors, leading to an increase in NPL. A loan is classified as non-performing when the principal and interest remain unpaid for six months or more from the first day of default [6]. The factors influencing NPL can be both institutional or structural, and macroeconomic in nature. These factors have an impact on the overall health of the banking sector and the economy as a whole.

The effect of macroeconomic variables on the NPLs has been an important point of interest to scholars in the current trend of research in finance. It is commonly concluded that the NPLs of commercial banks can be affected by internal and external

factors. According to [6], the internal factors are regarded as bank-specific factors that affect the bank's performance. These factors are basically influenced by the internal decisions of management and the board. While the external factors are sector-wide or country-wide factors that are beyond the control of the banks and affect NPLs. These external factors include macroeconomic variables such as interest rates, gross domestic product (GDP), inflation, and exchange rates. Businesses must be aware of macroeconomic factors that affect firm value in order to lessen the shock they cause to future cash flows and NPLs [7]. The necessity for businesses to estimate the diverse effects of various macroeconomic elements on future business performances arises from the reality that macroeconomic parameters like the GDP growth rate, inflation rate, and currency rates are outside the control of an organization [8]. In addition to suppliers, rivals, and government fiscal policy measures, regulations and policies, macroeconomic elements also exist outside of the organization and are not under management's control that affects NPLs [9].

From the foregoing, the rising trend of low NPLs in Nigeria has had a detrimental impact on the availability of financial resources for economic agents, thus constraining financial intermediation and economic activities, ultimately affecting economic growth [10]. When NPLs remain low, it means that fewer loans are turning bad, indicating that banks are cautious when lending to borrowers who may have higher credit risks. While this cautious approach by banks may reduce the risk of bad loans, it can also lead to a reduced availability of credit for businesses and individuals in the economy. Therefore, this study aims to examine the relationship between macroeconomic variables and the non-performing loan ratio of banks in Nigeria.

## 2. Theoretical review and empirical literature

This study offers an analysis of the Bad Luck Hypothesis, a theory explaining the causes of NPLs. Introduced by Berger and DeYoung in 1997, the Bad Luck Hypothesis posits that external factors impacting the economy similarly influence NPLs, leading to increased costs for banks in managing these loans and ultimately weakening their cost efficiency.

According to this hypothesis, external events contribute to a rise in problematic loans for banks.



Missed loan repayments or breaches in the original agreement terms result in additional managerial costs and efforts to deal with these problem loans. Consequently, the theory predicts that an upsurge in NPLs would lead to a decline in cost performance for banks. However, it is important to note that the “extra expenses associated with problem loans create the appearance, but not necessarily the reality, of lower cost efficiency” [11, p. 20].

Dimitrios, Louri, and Tsionas [12] state that the bad luck hypothesis assumes external factors play a role in elevating bank NPLs, leading to higher operating costs when dealing with such problem loans and consequently reducing banks’ overall efficiency. These additional operating costs can arise from various factors, including monitoring moral hazard, borrower and collateral valuation, and the cost of recovering and selling collateral in case of non-payment [13].

The bad luck hypothesis proposes that NPLs are primarily caused by factors beyond the banks’ control, such as adverse weather conditions or sudden price fluctuations in specific commodities, among other things. This study relies on the bad luck hypothesis as it presents a credible explanation for the NPLs in the banking industry and the factors influencing them. Specifically, the theory highlights how external factors impact the economy and, consequently, NPLs in the banking sector. Hence, this theory provides a comprehensive framework for understanding NPLs and their determinants in research.

Aside from the foregoing, the empirical past academic literature from outside and within Nigeria that has resulted in different findings and conclusions was reviewed. Kanum and Olweny [14] used a panel data set of 29 East African listed banks to examine the effect of macroeconomic indicators on NPLs. The study found that interest rate, money supply, and bank size have a significant positive relationship with bank NPLs. Kigamwa and Mutwiri [15] examined macroeconomic factors and Kenyan banks’ non-performing ratios using inferential and descriptive statistics and found that the real interest rate has a positive relationship while the exchange rate has both a negative and positive relationship with NPLs. Similarly, [15, 16] used the generalized method of moments (GMM) model and found that GDP growth, unemployment rate, gross domestic savings, and real interest rate have a positive impact on NPLs.

Anita et al. [8] examine the impact of selected macroeconomic factors on NPLs in a panel of eight

South Asian Association for Regional Cooperation countries (Afghanistan, Bangladesh, Bhutan, India, Nepal, the Maldives, Pakistan, and Sri Lanka) during the period 2008–2019. The research employs various statistical methods, including ordinary least squares (OLS), fixed effect estimates, and random effect estimates, with robust fixed effect estimates used to address heteroscedasticity. The empirical findings confirm a significant positive association with government budget balance and a significant inverse relationship with GDP, sovereign debt, inflation rate, and money supply, as previously observed in other studies. Likewise, Msomi [17] uses data from 47 listed commercial banks across six countries (19 banks from Nigeria, 14 banks from Benin, 3 banks from Burkina Faso, 3 banks from Gambia, 3 banks from Guinea, and 5 banks from Liberia) for the period from 2008 to 2019. The analysis employs fixed and random effect models, with the Hausman test favoring the fixed effect model. Results indicate that liquidity ratio, capital adequacy ratio, and inflation rate significantly affect NPLs.

Ahmed et al. [18] conducted a study to investigate the impact of bank-specific and macro-economic factors on NPLs in Bangladesh. The study collected annual panel data from the best 26 conservative banks and four Islamic banks in Bangladesh for the period between 2014 and 2018. The loan-to-deposit ratio showed a negative influence on NPLs, indicating that a higher loan-to-deposit ratio was linked to a decrease in NPLs. Furthermore, the study found a positive relationship between capitalization, economic growth, bank size, and NPLs, but the relationships were statistically insignificant.

Prasanth, Nivetha, Ramapriya, and Sudhamathi [19] conducted a study to explore the factors influencing NPLs in India between 2015 and 2019. They collected secondary time series statistics from the bank’s audited yearly reports and performance reports. The researchers used a multiple linear regression equation to create their model. The results of the regression analysis showed that three variables, namely the loan-to-deposit ratio, financial efficiency as measured by return on equity, and capital adequacy, were statistically significant determinants of NPLs. These variables had a notable impact on NPLs in Indian banks during the study period. On the other hand, the study found that other variables such as loan growth, cost-effectiveness, and bank size were analytically insignificant in influencing NPLs.

Koju, Koju, and Wang [20] conducted a study to evaluate the macro-economic and bank-specific factors influencing NPLs in the Nepalese banking system. They collected data from 30 commercial banks in Nepal between 2003 and 2015. The analysis assessed the impact of seven bank-specific and five macro-economic variables on NPLs. The results indicated that the export-to-import ratio had a positive and significant relationship with NPLs, while cost efficiency and asset size showed a negative relationship with NPLs concerning GDP growth rate, capital adequacy, and inflation rate.

Rajha [11] conducted a study to explore the bank-specific and macro-economic factors that could influence NPLs in commercial banks in Jordan. The study utilized an exclusive annual dataset covering all periods from 2008 to 2012 and employed a regression model to analyze the collected data. The findings of the study showed that NPLs in the Jordanian banking sector were notably and significantly affected by two factors: the ratio of loans to total assets and the lagged NPLs. These variables had a significant impact on the occurrence of NPLs in commercial banks during the studied period.

Ghosh [21] conducted an analysis using a dynamic GMM and fixed effect model to examine bank-specific and economic variables affecting aggregate NPLs in 50 banks in both Columbia and the USA from 1984 to 2013. The study's findings indicated that increasing GDP, housing price index, and personal income growth rate led to a decline in NPLs, while sovereign debt and the rate of unemployment significantly increased NPLs. Subsequently, [22] confirmed these impacts in their study on the Greek economy from 2001 to 2015.

Umar and Sun [10] noted that there is an insignificant relationship between banks' liquidity and NPLs. According to their observations, the liquidity creation by Chinese banks appears to be independent and unrelated to changes in NPLs. They argued that liquidity creation serves as a better measure of risk compared to loan growth, which was used in previous studies. Liquidity creation offers a more precise assessment of the absolute amount of risk transformation in the banking system.

Egiyi [4] investigated the link between NPLs and key macroeconomic indicators. Economic data for interest rates, inflation, GDP, and NPLs were analyzed quarterly from 2016 to 2020. The Gaussian regression analysis revealed a positive relationship between interest rates, inflation, and NPLs. Conversely, there

was a negative relationship between GDP and NPLs, indicating that NPLs have a detrimental impact on economic growth.

Tomi, Iliyasu, and Mojisola [23] focused on NPLs in Nigerian Deposit Money Banks (DMBs), spanning the period from 1999 to 2019. Panel data from the annual reports of listed DMBs were collected and analyzed. The researchers utilized the random effect model, determined through the Hausman test, as their panel data technique. The findings indicated that the loan-to-total assets ratio (LTAR) exhibited a significantly positive relationship with the NPLs of banks, suggesting that as the LTAR increased, NPLs also increased. On the other hand, the capital adequacy ratio (CAR) showed an insignificant relationship with the NPLs of banks, implying that CAR had no significant impact on NPLs during the studied period.

Ibitomi and Micah [2] conducted an empirical analysis of NPLs and liquidity of DMBs in the Nigerian context. The study used a panel regression analysis on data from 15 quoted DMBs spanning from 2009 to 2019. Based on their empirical findings, the study identified four variables that were significantly related to banks' liquidity at a 5% significance level. These variables are NPLs, capital adequacy ratio, bank size, and inflation. On the other hand, three variables, namely GDP, loan growth, and monetary policy rate, were found to be insignificant in their relationship with banks' liquidity.

The study [9] investigated the relationship between interest rates and the loan performance of DMBs in Nigeria from 2010 to 2015. They analyzed various factors, including loan repayment, credit quality, and loan loss provision as dependent variables, and interest rates, monetary policy rate, liquidity ratio, non-interest fee income, capital adequacy, and NPLs as independent variables. The findings revealed a significant connection between interest rates and loan repayment, measured by credit quality using the NPL ratio. A rise in interest rates could impact credit quality positively or negatively. The study also noted that even small improvements in lending rates could lead to an increase in NPLs.

Ayunku and Uzochukwu [5] conducted a study that examined the credit management and bad debt issues among listed Nigerian DMBs. The study focused on four independent variables: loan loss allowance, loan-to-deposit ratio, equity-to-asset ratio, and loan write-off. The research period spanned five years, from 2014 to 2019. To analyze the data, the researchers utilized descriptive statistics, cor-

relation analysis, and the ordinary least squares regression method. The findings indicated that in both the return on asset and Tobin-Q models, the study developed random effect models that showed NPLs, loan loss provision, and equity-to-asset ratio significantly influencing bank performance.

In a study by Mustafa and Jeffery [1] on Nigerian commercial banks, data were collected and analyzed using econometric techniques, including co-integration analysis. The results indicated a positive relationship between NPLs, capital adequacy, and GDP with loans and advances. On the other hand, the interest rate showed a negative relationship, and total deposits had an insignificant effect on bank loans and advances.

In a study conducted by Atoi [24], the focus was on NPLs and their impact on the stability of Nigerian banks with national and international operational licenses. The research covered the period from 2014(Q2) to 2017(Q2). To analyze the factors influencing NPLs in each licensed group, a “restricted” dynamic GMM was utilized. The Z-score served as a proxy for banking stability, and its response to NPL shocks was examined using a panel vector autoregressive approach. The study’s findings revealed that the drivers of NPLs varied between the two types of banks, national and international. However, it was observed that the weighted-average lending rate played a crucial role as a macroeconomic trigger for NPLs for both categories of banks.

Ademola [25] conducted a study to examine the determinants of NPLs in listed DMBs in Nigeria. The study focused on data from 2006 to 2016, using secondary data sources. NPLs were the dependent variable, while the study considered several explanatory variables, including capital adequacy ratio, loan-to-total asset ratio, loan loss provision by banks, crude oil price, and exchange rate. The research employed panel regression estimation. The study’s findings revealed that the loan loss provision ratio, loan-to-asset ratio, and crude oil price had a positive and significant impact on the NPLs of banks. On the other hand, the capital adequacy ratio and exchange rate exhibited a positive but statistically insignificant impact on the NPLs, indicating that their influence on NPLs was not significant.

From 1994 to 2014, Etale, Ayunku, and Etale [26] conducted a study examining the relationship between NPLs and bank performance in Nigeria. Data for the analysis were gathered from the Central Bank of Nigeria (CBN), the Nigeria Deposit Insurance Cor-

poration (NDIC), and the annual reports of listed banks. The researchers employed the ADF unit root test, descriptive statistics, and multiple regression techniques for their analysis. The study’s findings indicated that bad loans and doubtful loans had a statistically significant negative impact on return on capital employed (ROCE), indicating that these types of NPLs had adverse effects on the banks’ performance. However, sub-standard loans had a statistically insignificant negative influence on ROCE, implying that their impact on bank performance was not significant.

From the empirical review, studies such as [8, 20, 27], and others carried out their respective research outside Nigeria using various macroeconomic variables to predict the non-performing loan. Despite all the variables used, none of these studies have examined fiscal macroeconomic variables such as tax revenue and the recurrent expenditure of the government on non-performing loans of banks.

In Nigeria, various studies such as [2, 4, 5] and others have examined various macroeconomic variables on the non-performing loans of banks in Nigeria without using government tax revenue and recurrent expenditure as variables that also determine the non-performing loans of banks in Nigeria. Therefore, this study will fill this gap by including fiscal macroeconomic variables such as tax revenue and recurrent expenditure to predict the non-performing loans of banks in Nigeria using time series data.

### 3. Methodology

This section outlines the model specification, research design, data sources, data collection method, and technique for data analysis.

#### 3.1. Model Specification:

The study adopts a model similar to the one used in the previous study of Anita et al. [8] as follows:

$$NPL_{it} = \beta_0 + \beta_1 M2GDP_{it} + \beta_2 EXC_{it} + \beta_3 GDP_{it} + \beta_4 FISCAL_{it} + \beta_5 INFL_{it} + \beta_6 DEBT_{it} + \epsilon_{it} \quad (1)$$

However, the model was re-modified as this:

$$NPL_t = \alpha + \beta_1 \ln TRV_t + \beta_2 \ln M2_t + \beta_3 RIR_t + \beta_4 \ln REX_t + \beta_5 EXG_t + \epsilon_t, \quad (2)$$

where *NPL* – Non-performing loan ratio  
*TRV* – tax revenue  
*M2* – broad money supply



*RIR* – real interest rate  
*REX* – recurrent expenditure  
*EXG* – exchange rate

$\beta_1, \dots, \beta_5$  – slopes;  $\alpha$  – intercept;  $\varepsilon$  – error term;  
*t* – the *t*-th period of variables; ln – natural logarithm.

Variables are explained in *Table 1*.

### 3.2. Research design

The research design for this study is descriptive in nature. This choice is based on the study’s objective, which is to establish the empirical relationship between fiscal policy measures and bank performance in Nigeria. A descriptive research design is suitable for investigating two or more variables empirically. Additionally, this design enables the collection of quantitative data, which can be analyzed using descriptive and inferential statistics.

### 3.3. Data sources and collection method

The data gathering approach will be secondary and will cover the 32-year observation period from 1990 to 2021 because the data for this study are quantitative. This time frame was selected because it includes the years following the 2008–2009 financial crises, all of which may have had an impact on the topics being studied.

The Nigeria Deposit Insurance Cooperation (NDIC), the Central Bank of Nigeria, the Nigeria Bureau of Statistics (NBS), and the World Bank Development data bank provided the secondary data for this study.

### 3.4. Techniques for data analysis

This study uses a time series data process and time series analysis, and the relationship between the dependent variable (non-performing loans) and the independent variable (macro-economic variables) is investigated using the OLS econometric technique. This econometric method contains BLUE properties, making it appropriate for analysis. The Augmented Dickey-Fuller (ADF) test for unit root is used to ascertain the stationarity of the variables in the study, which is a pre-test on the model. The type of OLS regression technique based on the results of the unit root test is the ARDL error correction model. The models will also be put through a stability test to determine their stability. Additionally, tests for serial correlation, normality, the Ramsey RESET test, and heteroskedasticity will be carried out to diagnose the model.

The ARDL model for study:

$$\begin{aligned}
 NPLR_t = & \alpha + \sum_{i=1}^{n1} \gamma NPLR_{t-i} + \sum_{i=1}^{n2} \beta_1 \ln TRV_{t-i} + \sum_{i=0}^{n3} \beta_2 \ln M2_{t-i} + \\
 & + \sum_{i=0}^{n4} \beta_3 RIR_{t-i} + \sum_{i=0}^{n5} \beta_4 \ln REX_{t-i} + \sum_{i=0}^{n6} \beta_5 EXG_{t-i} + \\
 & + \sum_{i=1}^{n1} \gamma \Delta NPLR_{t-i} + \sum_{i=1}^{n2} \beta_1 \Delta \ln TRV_{t-i} + \sum_{i=0}^{n3} \beta_2 \Delta \ln M2_{t-i} + \\
 & + \sum_{i=0}^{n4} \beta_3 \Delta RIR_{t-i} + \sum_{i=0}^{n5} \beta_4 \Delta \ln REX_{t-i} + \sum_{i=0}^{n6} \beta_5 \Delta EXG_{t-i} + \\
 & + \delta ECM_{t-i} + \varepsilon_t.
 \end{aligned} \tag{3}$$

## 4. Data analysis and interpretation of results

### 4.1. Descriptive statistics for the study

*Table 2* shows that all variables, the dependent variable (non-performing loan ratio – *NPLR*) with standard deviation value of 13.45 and a mean of 19.75, has improved over the years. Likewise, all the independent variables (tax revenue, recurrent expenditure, real interest rate, exchange rate, and money supply (*M2*)) in Nigeria have improved over the years.

### 4.2. ADF unit root test

*Table 3* depicts the unit root test using the ADF test. The result shows that the non-performing ratio and real interest rate were stationary at level  $I(0)$ , while other variables such as tax revenue, recurrent expenditure, broad money supply (*M2*), and exchange rate were stationary at first difference  $I(1)$ .

### 4.3. ARDL Bound Test Cointegration Test

The ARDL bound test result in *Table 4* revealed F-Stat (8.0363), which is greater the upper bound at the 1% significance level. This indicates that macro-economic variables have long run relationship with banks non-performing ratios in Nigeria.

### 4.4. Regression results and discussion: error correction model (short-run and long-run results)

From *Table 5*, it revealed the ECM regression result for both the short-run and long-run relationship between macro-economic variables and the non-performing ratio of banks in Nigeria. The short-run result revealed that one lag of the non-performing loan ratio (*NPL*) has a negative and significant relationship with *NPL* in Nigeria. In addition, tax revenue and recurrent expenditure have a negative relationship with *NPL* in Nigeria, although only re-



Table 1  
Variable(s) explanation

S/N	Variable(s)	Description	Source(s)
1	Non-performing Loan Ratio (NPL)	Aggregate Ratio of non-performing loans to Total banks loans	Nigeria Deposit Insurance Cooperation (NDIC), Central Bank of Nigeria
2	Tax Revenue (TRV)	Total tax revenue accrued by government annually	Central Bank of Nigeria, Nigeria Bureau of Statistics (NBS)
3	Recurrent Expenditure (REX)	Total recurrent expenditure paid yearly by government	Central Bank of Nigeria, Nigeria Bureau of Statistics (NBS)
4	Broad Money Supply (M2)	Aggregate stock of money in a financial system annually	Central Bank of Nigeria, Nigeria
5	Real Interest Rate (RIR)	Annual Rate at which borrowers pay for using borrowed funds (%)	Central Bank of Nigeria, World Bank Development database
6	Exchange Rate (EXG)	Local currency units relative to U.S. dollars	Central Bank of Nigeria, Nigeria

Source: Developed by the author.

Table 2  
Descriptive statistics result

Variables	NPLR	LNTRV	LNREX	LNM2	EXG	RIR
Mean	19.75313	6.400381	6.807880	14.91015	136.6216	3.896875
Median	19.55000	6.592110	7.211725	14.93100	128.9350	5.900000
Maximum	44.80000	8.760787	9.120979	17.59561	363.2100	18.20000
Minimum	2.960000	2.906901	3.589611	11.13696	8.040000	-31.50000
Std. Dev.	13.45212	1.763323	1.677808	2.038238	104.0835	10.41307
Observations	32	32	32	32	32	32

Source: Developed by the author.

current expenditure was significant at 5%. Similarly, broad money supply ( $M2$ ), real interest rate, and exchange rate have a positive relationship with  $NPL$  in Nigeria, but only the exchange rate was significant.

Moreover, the short-run shocks that cause disequilibrium in the long run can be adjusted each year with a speed of  $(-1.65)$ , which is significant at the 1% level. This suggests that the adjustment speed is non-monotonic rather than oscillatory. Hence, this indicates that the error correction process fluctuates around the long-run value, and when this process is completed, there is rapid convergence to the path of equilibrium [29].

## 5. Discussion of findings

The long-run result shows that tax revenue has a negative and significant relationship with banks'

$NPL$  in Nigeria with a coefficient of  $-11.73$  significant at 1%. This suggests that a percent increase in tax revenue will reduce banks  $NPL$  in Nigeria by 11.73%. Tax revenue improvement reduces the non-performing loan ratio of banks, which simply implies that individuals and corporate entities are making judicious use of borrowed funds, which results in higher tax revenue accrued and, as such, possesses enough funds to pay back interest and the principal loans advanced by banks. This was in line with prior expectations that tax revenue has a significant negative relationship with banks'  $NPLs$  in Nigeria. Similarly, recurrent expenditure with a coefficient value of  $-7.73$  has a negative relationship with the non-performing loans of banks in Nigeria. However, the result further revealed that the relationship is non-significant between recur-

Table 3  
ADF Stationary Unit Root Test Results

Variables	Statistics Values	Sig. Values	Order of Integration	Remarks
Non-performing ratio	-7.023	0.0000***	I(0)	Stationary
Tax revenue	-8.545	0.0000***	I(1)	Stationary
Recurrent expenditure	-9.434	0.0000***	I(1)	Stationary
Money supply	-4.0569	-0.0018**	I(1)	Stationary
Real interest rate	-4.2836	-0.0000***	I(0)	Stationary
Exchange rate	-4.5654	-0.0000***	I(1)	Stationary

Source: Developed by the author.

Note: \*\*\* and \*\* shows significance level at 1% and 5% respectively.

Table 4  
Null hypothesis: No long-run relationships exist.

Bound test result		
Test Statistic	Value	K
F-statistic	8.036372	5

Critical Value Bounds		
10%	2.75	3.79
5%	3.12	4.25
2.5%	3.49	4.67
1%	3.93	5.23

Source: Developed by the author.

rent expenditure and banks' *NPLs* in Nigeria. This was contrary to the prior expectation that the relationship would be negative and significant between recurrent expenditure and banks' *NPLs* in Nigeria.

The study further revealed that broad money supply has a positive and significant at 1% relationship with banks' *NPL* in Nigeria, with a coefficient value of 32.82. This implies that a percentage increase in the broad money supply (*M2*) will increase the banks' *NPL* in Nigeria by 32.82%. Although, when there is an expansion of the money supply, banks have more funds available to lend to borrowers. However, if these loans are extended without proper evaluation of the borrowers' creditworthiness, it can lead to a higher likelihood of borrowers defaulting on their repayments. This, in turn, results in an increase in non-performing loans for the banks. This was in

contravention of the findings of [8], where the study discovered a significant negative relationship between money supply and non-performing loans. This may be the result of the data used and the country in which the study was conducted.

Furthermore, the real interest rate has an insignificant negative relationship with the non-performing loans of banks in Nigeria, with a coefficient value of -0.07. This suggests that with an increase in the real interest rate, the non-performing loans of banks in Nigeria will decrease by 0.07%, but this is insignificant. This agreed with the findings of [1, 2, 9] that the real interest rate has a negative but insignificant relationship with the non-performing loans of banks in Nigeria. However, contrary to the finding of [4, 15, 16] that the real interest rate has a positive relationship with the non-performing loans of banks in Nigeria. This is because higher interest

Table 5  
Regression result

Variables	Non-performing Ratio (NPLR) Long-Run Results		Short-Run Results	
	Coefficient	Sig Value	Coefficient	Sig Value
$NPL(-1)$	-	-	-10.82	0.000***
Tax revenue	-11.73	0.000***	-5.331	0.123
Recurrent expenditure	-7.73	0.108	-10.37	0.015**
$M2$	32.82	0.0036***	8.807	0.202
Real interest rate	-0.07	0.486	0.064	0.304
Exchange rate	0.21	0.000***	0.253	0.000***
$\delta ECM_{t-1}$	-	-	-1.53***	0.000***

Source: Author's EViews Result.

Table 6  
Diagnostic tests for the study

Non-performing ratio (NPL)		
Diagnostic test	Coefficient	Significance value
R <sup>2</sup> Adjusted	0.82	-
BG-LM test	0.20	0.823
Ramsey Reset Test	1.36	0.297
JB Test	2.79	0.248
ARCH Test	0.57	0.570
Durbin-Watson Test	1.89	-
F-statistics	12.96	0.0000***

Note: \*\*\*,\*\* and \* shows significance level at 1%, 5% and 10% respectively.

Source: Author's EViews results, 2023.

will lead to an increase in the non-performing loans of banks, as defaulters will not be able to pay.

Lastly, the exchange rate has a positive and significant relationship with the non-performing loans of banks in Nigeria, with a coefficient value of 0.21. This suggests that an increase in the exchange rate will increase the non-performing loans of banks in Nigeria by 0.21%. This is because changes in the exchange rate can also affect the overall economic environment. A depreciating domestic currency can contribute to inflationary pressures, which might lead to higher production costs for businesses and reduced consumer purchasing power. These eco-

nomical challenges can result in decreased business performance and individual financial stress, both of which can contribute to a higher likelihood of loan defaults and, consequently, an increase in *NPLs*. This is contrary to prior expectations and to the findings of [25] that the exchange rate has a negative and insignificant relationship with the non-performing loans of banks in Nigeria.

### 5.1. Diagnostic and stability tests

Test results are shown in *Table 6*. The BG-LM test of auto (serial) correlation indicates that the model does not suffer from auto correlation, meaning

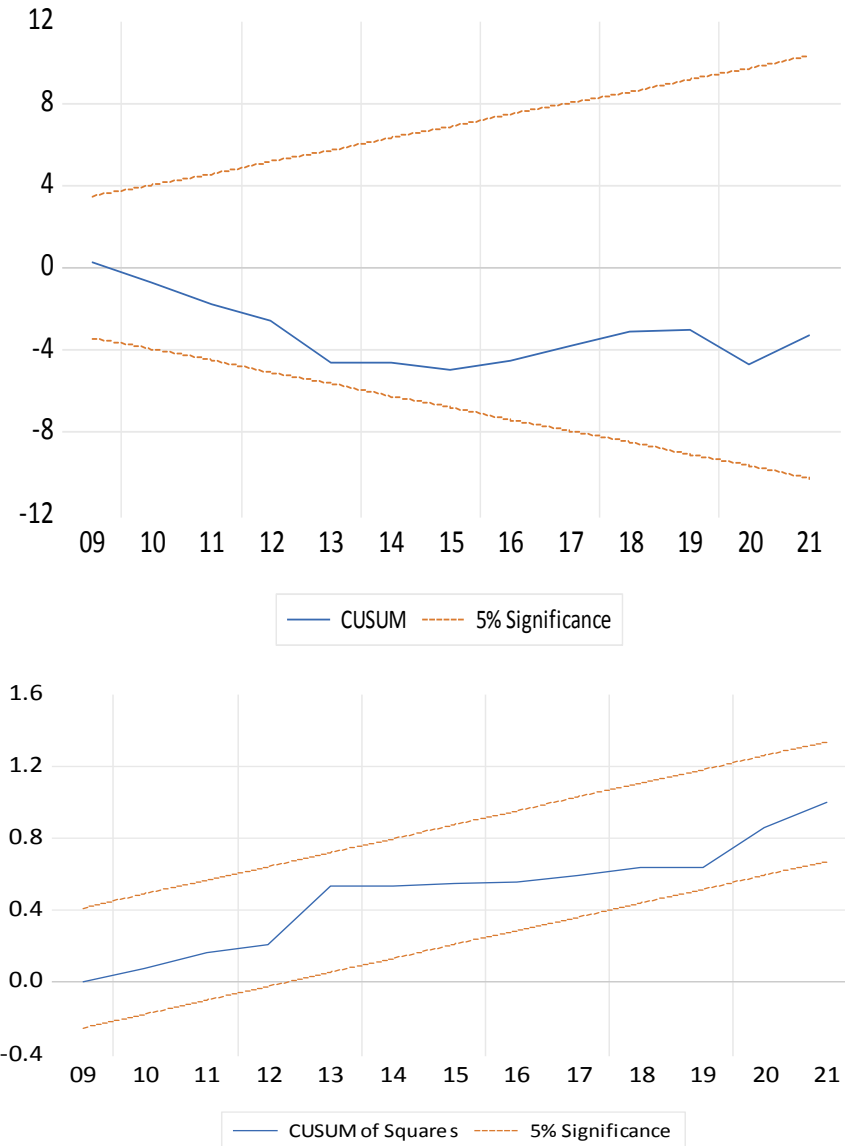


Fig. CUSUM and CUSUM square test for the models

Source: Developed by the author.

there is no correlation between the values of the same variables (lag) over successive time intervals. The Ramsey RESET test confirms that there is no misrepresentation or misspecification of the model. Additionally, the JB test of normality demonstrates that all residuals (error terms) are normally distributed. The presence of ARCH heteroskedasticity suggests that the errors are constant and independent of the regressors, thereby ruling out any problem of heteroskedasticity. The Durbin-Watson Test value of 1.89 is close to 2.0 and shows that there is no first-order autocorrelation.

To ensure that the model used is stable and the long run relationship is valid, the study conducted a stability test using the cumulative sum of recursive residuals (CUSUM) and cumulative sum of squares of recursive residuals (CUSUMSQ). Fig. revealed that

the plots for both monetary and fiscal policy variables and are within the 5% critical boundary. This suggests there is stability in the long-run relationship among the variables. In addition, the coefficients of the variables in the model are stable. Admittedly, it can be concluded that the models are stable.

### 6. Conclusion and recommendations

This study investigates the relationship between macro-economic variables and the non-performing loans of Nigerian banks. From the findings, it can be concluded that macroeconomic variables (tax revenues, real interest rate, and recurrent expenditure) have a negative relationship with the non-performing loans of Nigerian banks. This suggests that as tax revenues increase, real interest rates rise, or recurrent expenditure goes up, the level of



*NPLs* tends to decrease. These variables likely influence borrower capacity, financial stability, and economic conditions, impacting the likelihood of loan defaults.

Based on the findings and conclusions, the study suggests the following recommendations. There should be improvements in tax collection processes and enforcement to boost tax revenue because it will have a positive impact on the financial health of banks and borrowers. This can be achieved through better tax monitoring, efficient collection systems, and addressing tax evasion. Similarly, given the insignificant negative relationship between the real interest rate and non-performing loans of banks, it is recommended to focus on bank-specific factors that may have a more significant impact on *NPLs*. Banks should prioritize effective credit risk management closely, and consider diversifying their loan portfolios to reduce concentration risk. Similarly, the observed positive relationship between money supply and *NPLs* in Nigeria suggests that a careful balance

needs to be struck regarding broad money supply, considering its effects on economic growth, financial stability and citizens' wellbeing as well. Overall, this relationship highlights the importance of prudent lending practices and effective risk management by banks and regulatory authorities to mitigate the negative impact of excessive money supply growth on the quality of loan portfolios and the stability of the banking sector. Likewise, it is recommended that governments prioritize fiscal discipline and prudent spending practices. By controlling recurrent expenditure, governments can create a stable economic environment, which may reduce the occurrence of *NPLs* in banks. Lastly, it is essential for banks to closely monitor and manage their liquidity levels. Effective liquidity management strategies should be implemented to ensure sufficient funds to meet obligations and mitigate the impact of *NPLs* on the bank's overall financial health. This is for further studies' consideration on the determinants of reducing the *NPLs* of banks in Nigeria.

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ORIGINAL PAPER

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# Does Price Discrimination Increase Social Welfare?

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## ABSTRACT

The process of charging a different price to a different group of consumers for similar goods and services is called price discrimination. The relationship between price discrimination and social welfare has been an important topic of research and discussion for many years. The **purpose** of the study is to determine the conditions under which price discrimination improves or reduces social welfare. The authors used a **method** of series of literature reviews to gather information about the relationship between price discrimination and social welfare. The study **showed** that price discrimination can improve social welfare if output is increased. The increase in output increases social benefits and overcomes the loss of welfare due to the inefficient distribution of products. The **key conclusion** is that the social benefits of price discrimination are the availability of essential services to low-income groups and the maintenance of equity in the consumption of public goods. This study has major **implications** for the formulation of a policy that introduces price discrimination to maintain equity among different income groups and ensure the availability of high-cost essential services.

**Keywords:** price discrimination; consumer efficiency; demand function; market; output; social welfare; price fairness

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ОРИГИНАЛЬНАЯ СТАТЬЯ

# Повышает ли ценовая дискриминация социальное благосостояние?

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## АННОТАЦИЯ

Процесс установления различных цен для разных групп потребителей на аналогичные товары и услуги называется ценовой дискриминацией. Взаимосвязь между ценовой дискриминацией и социальным благосостоянием является важной темой исследований и дискуссий на протяжении многих лет.

**Цель исследования** – определить условия, при которых ценовая дискриминация улучшает или ухудшает социальное благосостояние. Для сбора информации о взаимосвязи между ценовой дискриминацией и социальным благосостоянием авторы использовали **метод** серии обзоров литературы. Исследование показало, что ценовая дискриминация может улучшить социальное благосостояние, если увеличивается объем производства. Увеличение выпуска продукции повышает социальные выгоды и компенсирует потери благосостояния из-за неэффективного распределения продукции. Основным **вывод** заключается в том, что социальными выгодами ценовой дискриминации являются доступность основных услуг для групп населения с низким уровнем дохода и поддержание справедливости в потреблении общественных благ. Данное исследование имеет важное **значение** для разработки политики, предусматривающей введение ценовой дискриминации для поддержания справедливости

среди различных групп населения по уровню доходов и обеспечения доступности дорогостоящих основных услуг.

**Ключевые слова:** ценовая дискриминация; потребительская эффективность; функция спроса; рынок; объем производства; социальное благосостояние; справедливость цены

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## 1. Introduction

### 1.1. Background

Price discrimination is one of the most common marketing strategies. It is a practice in which a homogeneous commodity is sold at the same time to different consumers at different prices [1]. There are three types of price discrimination: first-degree or perfect price discrimination, second-degree price discrimination or nonlinear pricing, and third-degree price discrimination. In first-degree price discrimination, the seller charges a different price for each unit of the good in such a way that the price for each unit is equal to the maximum willingness to pay for the unit product. In this case, all the profit from the trade goes to the monopolist, which is efficient because there is no deadweight loss. The second-degree of price discrimination occurs when a different price is charged for a different number of products bought but not across consumers. This means every consumer gets the same price list, but it depends on the number of products they buy. The third-degree of price discrimination occurs when different customers are charged different prices. This is the most common type of price discrimination we can see in our society [2]. For example, airlines and travel agencies provide identical services but apply varied pricing structures for distinct demographic groups like children, students, and adults. Moreover, discrimination in pricing is prevalent in sectors like telecommunication fees, electricity pricing, and various industries dominated by oligopolistic enterprises [3].

For successful discrimination, there are some conditions. First, the firm should determine different segments of the market, and these different segments should have different price elasticity. Markets must be differentiated based on the nature of use, physical distance, and time. Similarly, the firm should have monopoly power [4].

Since the 1920s, there has been an issue among economists about whether price discrimination

increases or decreases social welfare. Social welfare is considered optimal when it is not practicable to make anyone better off from the allocation of goods and services without making anyone worse off [5]. Pigou [2] demonstrated that under restrictive conditions, social discrimination reduces social welfare. He demonstrated that price discrimination reduces social welfare by adopting three assumptions. All markets must have nondiscriminatory prices, surpluses derived from groups of consumers, and profits that contribute equally to social welfare and have linear demand functions [2]. After some time, different academics showed that price discrimination can improve social welfare under a specified condition [6]. For welfare improvement, an increase in total output is the most important condition [7]. In third-degree price discrimination, there is the existence of consumer inefficiency, which means the output is not distributed optimally as their marginal utility is unequal. When there is a transformation from uniform pricing to price discrimination, a higher valuation of goods occurs, and consumers have a lower willingness to pay. The only way to avoid consumer inefficiency is to increase social output, which leads to social welfare [8]. To raise the condition of social welfare, the total output with discrimination should exceed the non-discrimination level [9]. Dwivedi [10] reported that price discrimination can be beneficial if it enhances overall social welfare by enabling lower-income families to afford products that they couldn't at regular market prices. This can lead to an improved standard of living and greater access to a variety of goods.

The relationship between price discrimination and social welfare has been an ongoing debate for many years. The social eligibility of third-degree price discrimination has been a very important research topic since the pioneering analysis of the problem done by Robinson [4]. Many economists consider price discrimination a good policy to improve social welfare, and many economists are raising questions about the consumption ineffi-



ciency resulting from price discrimination. This study focuses on third-degree price discrimination because it is a common strategy in industries like transportation, healthcare, and entertainment. It's relevant for understanding real-world pricing effects on social welfare and informing policymaking on consumer protection, anti-discrimination regulations, and competition policy. This pricing approach involves categorizing consumers based on observable traits, enabling a deep examination of how it affects diverse consumer groups and highlighting potential disparities in access to goods and services, impacting social welfare. This review paper provides a brief overview of the conditions under which price discrimination improves welfare and causes social welfare loss. It also presents the effects of price discrimination on the consumer and society.

### 1.2. Objectives

1. To determine if consumers are better off from price discrimination.
2. To determine if society as a whole is better off from price discrimination.
3. To determine the condition required for the improvement of social welfare from price discrimination and its social impact.

## 2. Materials and methods

### 2.1. Desk study

A desk study was done on the topic of price discrimination and social welfare to collect the relevant information. A brief study was done to find out the relationship between price discrimination and social welfare.

### 2.2. Collection of articles

After doing a series of literature studies, a number of articles related to price discrimination were collected. Then the most relevant articles were selected and studied thoroughly to generate ideas. A brief study about price discrimination, its types, advantages, and disadvantages was done. Similarly, a brief study of the concept of social welfare was done. The key points derived from these articles were documented, and further study was performed.

### 2.3. Summarization of ideas from articles

The information and results collected from different articles were written and critically evalu-

ated, and the findings were illustrated in the results and discussion section.

## 3. Results and discussion

### 3.1. Real life instances of price discrimination in society

If the seller can readily distinguish between customers with varying degrees of demand elasticity, they may opt for third-degree price discrimination. Numerous examples of third-degree price discrimination exist, such as discounts for senior citizens or students, fluctuating rates for weekends versus weekdays, and variable utility charges. In the past, federal marketing orders for agricultural products have served as illustrations of third-degree price discrimination [11]. For instance, federal milk marketing orders are designed to accommodate disparities in demand for milk used in beverages, soft dairy products (like yogurts and soft cheeses), hard dairy products (including butter and hard cheeses), and dry milk [12].

Consider a cafe that provides senior citizens with a discount on coffee. Even though the cost of producing a cup of coffee remains consistent, they charge 25-year-old customers more than their 75-year-old counterparts. This practice is likely based on the cafe owner's belief that senior citizens have more elastic demands than younger customers, allowing them to profit from varying prices. It's crucial to emphasize that price discrimination involves charging different prices for the same product or service. On the other hand, there are instances, like higher insurance rates for parents of teenage drivers, where certain customers are charged more due to increased risk and costs [11].

### 3.2. Change in welfare effect while shifting from uniform pricing to price discrimination

Any policy or economic change, in Kaldor's view, improves social welfare because the gainer can make up for the losers while still benefiting. Hicks asserts that a change is socially beneficial if it causes some people to gain and others to lose, and the losers are unable to compensate the winners in a way that would prevent them from supporting the change. The Hicks' criterion offers an exact definition of compensation. According to Mukoyama [13], the major critique

of the Kaldor-Hicks' criterion is that the compensation from winners to losers does not have to take place: the transfer is purely hypothetical. Thus, if, for example, a social welfare function places more weight on the losers' loss than the winners' gain, the Kaldor-Hicks criterion may not be compatible with maximizing social welfare. Such an issue does not occur if we stick to the Pareto criterion, which imposes a higher bar on conducting a policy.

### 3.2.1. Welfare effects of price discrimination

According to Aguirre [14], the assumptions are:

Consider good is sold in the two different markets.

The demand function is given by  $D_i(p_i)$  in market  $i$  (where  $i = 1, 2$ ).

Where  $p_i$  is the price taken in the market.

The inverse demand function is given by  $p_i(q_i)$ .

Where  $q_i$  is the sold quantity.

For market 1

$$\text{Welfare (W1)} = \int_{q_1}^{q_2} [p_1(q_1) - c] dq_1. \quad (1)$$

For market 2

$$\text{Welfare (W2)} = \int_{q_1}^{q_2} [p_2(q_2) - c] dq_2. \quad (2)$$

Then, the change in welfare while converting from uniform pricing to price discrimination is given by:

$$\Delta W = W1 + W2. \quad (3)$$

The welfare effect of third-degree price discrimination is shown in *Fig. 1*. The figure shows the calculation of the welfare effect of third-degree price discrimination by adding the positive and negative changes in the total surplus in the market. When there is a move from uniform pricing to price discrimination, then the change in welfare is the sum of the cumulative difference between the price and marginal cost for individual markets between the outputs under price discrimination [12]. Chung [15] studied the effect of price discrimination on welfare in cases where firms differ in the costs associated with improving product quality. The study demonstrated that, when there is a significant cost difference between the firms, price discrimination can enhance social welfare when compared to uniform pricing.

### 3.2.2. Use of misallocation effect and output effect on social welfare

*Figure 2* depicts the breakdown of the effect of social welfare into the misallocation effect and the output effect. The misallocation effect demonstrates the reduction in welfare caused by the transfer of  $q$  units of production from a market with lower elasticity to one with higher elasticity. The output effect illustrates the impact of changes in total output on social welfare [16]. Third-degree price discrimination's contribution to total output plays a crucial role in the effect of total output on social welfare. As the misallocation effect is always negative, the output effect should be positive to increase total social welfare [14]. To improve social welfare, an increase in output is required [9]. If total output remains constant, price discrimination in linear demand reduces social welfare. Similarly, when total output is increased, there would be no misallocation effects and a positive output effect [14].

Third-degree price discrimination leads to allocative inefficiency because it causes consumers with the same marginal utility to pay different prices based on how the market groups them. So, for third-degree price discrimination to improve social welfare, it must lead to a big increase in total output to make up for the way the market is misallocating resources [17]. Galera [18] studied how price discrimination affects welfare when quality disparities exist. Their findings indicate that when local firms' product qualities are identical, price discrimination consistently leads to an increase in welfare, primarily driven by a positive allocation effect associated with price discrimination.

### 3.3. The effect of price discrimination on welfare using the demand function

Consider the market to be strong if the discriminatory price is higher than the non-discriminatory price, and weak if it is lower. It is assumed that social welfare is proportional to the magnitude of discrimination. Likewise, it was assumed that both markets were supplied with positive quantities at non-discriminatory prices [19]. There is a reduction in social welfare if the direct demand function is at least convex in the strong market than that in the weak market (when the price rises with discrimination). For example, the demand curve has the same curvature, or

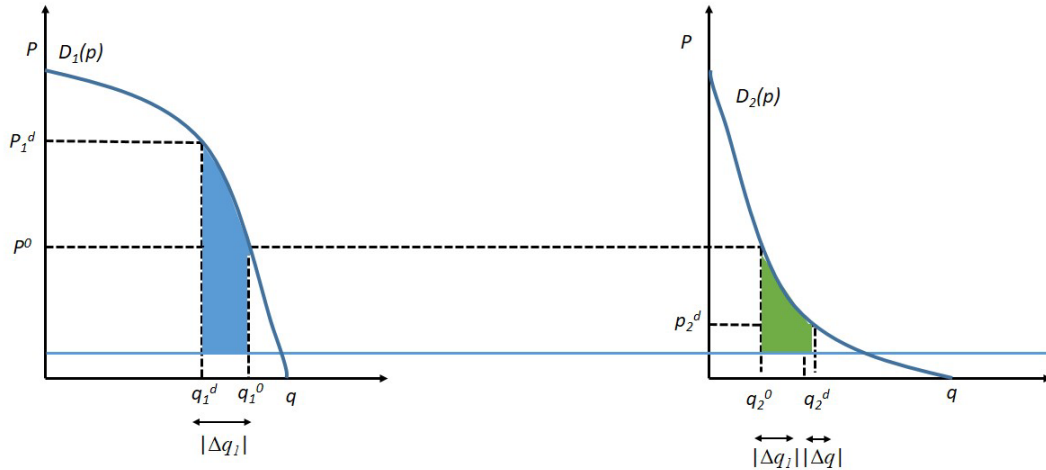


Fig. 1. Welfare effects of price discrimination

Source: Aguirre, 2012 [14].

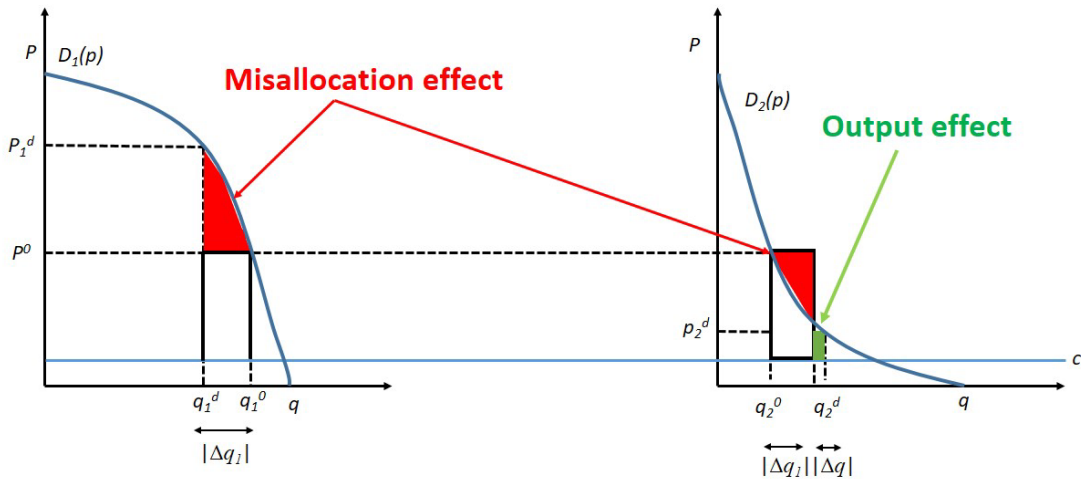


Fig. 2. Misallocation and output effect

Source: Aguirre, 2012 [14].

the demand curve is linear, so the curvatures are zero. There is improvement in social welfare if the inverse demand function in a weak market is more convex than in a strong market and the prices of discrimination are close to each other. When total output increases, societal welfare improves. When discriminatory prices are close together, there is a decrease in social welfare, which is also known as the misallocation effect. A strong market, for instance, possesses a linear demand function, whereas a weak market possesses an exponential demand function [20].

Certain conditions must be met for price discrimination to increase social welfare. A small amount of price discrimination increases welfare when direct demand in a strong market is less convex than direct demand in a weak market when

the market is initially priced without discrimination. When prices are initially discriminatory, marginal reductions in discrimination increase welfare when the inverse demand function in a strong market is less convex than in a weak market. Examples include demand functions with constant elasticity. Price increases that occur when demand is concave have a negligible effect on welfare. If a price falls in convexity, there is a substantial increase in output and welfare. When the price was increased in a market with concave demand and decreased in a market with convex demand, the output rose in a similar fashion [20]. When the weak market has convex demand and the strong market has concave demand, and one of the markets has strict convexity and concavity, it guarantees an increase in total output due

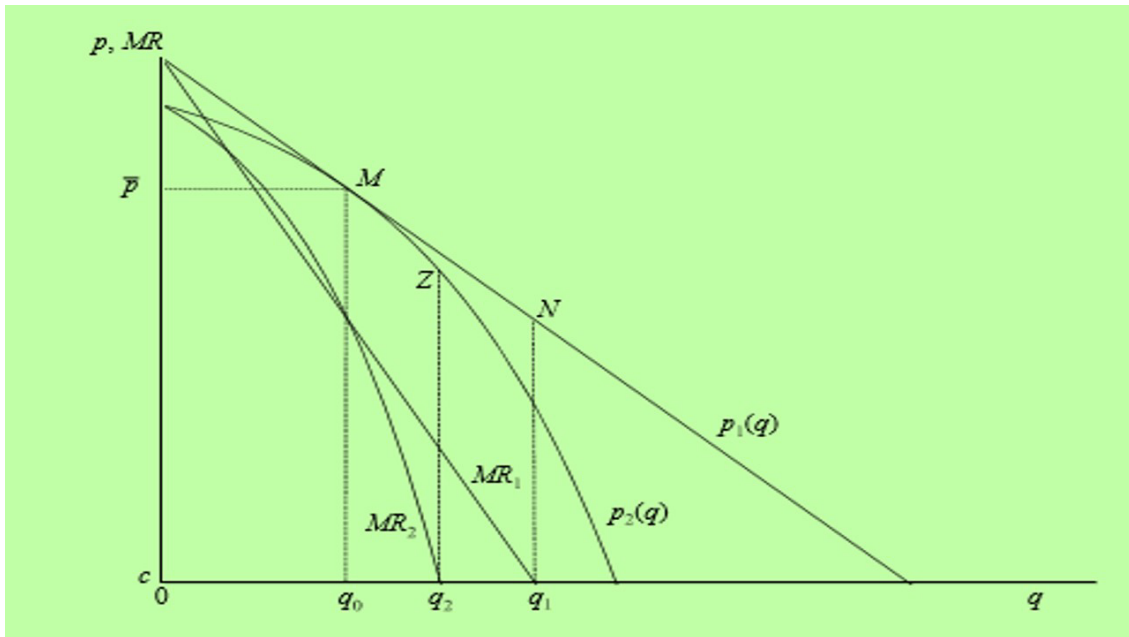


Fig. 3. Relationship of marginal revenue curve associated with demand curve that have point of tangency

Source: Based on Cowan, 2008 [20].

to price discrimination of the third degree [21]. While considering input costs based on prior research, Miklos and Shaffer [22] discovered that implementing price discrimination is less likely to result in an overall increase in total output if competition is more intense in strong markets compared to weak markets.

Suppose inverse demand is  $p_1(q)$  and transform inverse demand is  $p_2(q)$ . As price, demand slope and quantity are the same, the marginal revenues ( $MR$ ) for two demand functions are equal to quantity  $q_0$ . Marginal revenue with  $p_2(q)$  is always below  $p_1(q)$  because of the price reduction. The discrimination output is determined by the intersection of  $MR$  and  $MC$ . Here, the welfare gain in a weak market due to discrimination is lower than the transformed function. For every quantity, the price is lower because the output increase is lower. In Fig. 3,  $MNq_1 q_0$  shows the welfare gain from price discrimination with a linear demand function, and  $MZq_2 q_0$  shows the welfare gain from discrimination with a concave demand curve [20].

### 3.4. Price discrimination in homogeneous and heterogeneous firms

The most important condition for the improvement of welfare is an increase in total output. In third-degree price discrimination, there is no optimum distribution of output to the consumer because of their unequal marginal utility. In homogeneous firms, while changing from

uniform pricing to price discrimination, units of the product are withdrawn from consumers with higher good valuations and offered to consumers with low willingness to pay. Increasing output is the only way to prevent consumer inefficiency [8].

In the case of heterogeneous firms, to prevent consumer surplus inefficiency, better redistribution of output can be done. In this condition, a fall in output may not be responsible for the decrease in welfare caused by introducing price discrimination. When there are consumption externalities, the assumption of an increase in total output to improve social welfare may not hold [8]. For example, some bars give discounts on drinks to women to attract more women, and they also hope to attract more men too. With the increase in the number of women, the willingness to pay for men also increases. Positive externalities help to improve welfare [23].

### 3.5. Price discrimination and consumer welfare

The contribution of price discrimination to the better of consumers as a whole depends on whether the total output of the good increases or not. When the output effect is not considered, the inefficient distribution of goods under price discrimination can affect social welfare negatively [24]. Under price discrimination, the condition of the same marginal rate of substitution



for any of the two goods for all consumers is violated. This occurs because different consumers are charged different prices. Here, the welfare of one consumer can be increased without affecting the welfare of other consumers. However, third-degree price discrimination for any given level of output will have a negative effect on the efficiency of the distribution of goods and reduce consumer welfare [25]. So when output is increased due to price discrimination, it has social benefits and overcomes the loss of welfare due to the inefficient distribution of products. Similarly, price discrimination is adopted by sellers to capture the market's consumer surplus. Sellers can get higher total revenue from price discrimination than from uniform pricing.

Leslie [26] studied the impact of third-degree price discrimination on a Broadway theater performance, specifically the 50% discount offered at the ticket discount booth. His findings revealed that implementing this discount led to a 5% increase in profits compared to a uniform pricing strategy. However, Leslie [26] also discovered that the current 50% discount is excessively generous, resulting in a significant shift of customers away from full-price tickets. By reducing the discount to 30%, profits would actually increase by 7% compared to the uniform pricing strategy. Additionally, Leslie quantifies the overall consumer welfare effects of price discrimination and determines them to be relatively small.

### **3.6. Price discrimination and the betterment of society as a whole**

It is difficult to determine the desirability of price discrimination for a society as a whole. Price discrimination is considered desirable if it can increase the total output, but it is a fact that it causes the inefficient distribution of resources. In some cases, no output of a product is produced at a single price, and it only becomes profitable under price discrimination. In such cases, price discrimination is socially justified [27]. In the agricultural sector, farmers can increase their earnings by applying distinct prices to various consumer segments. This stimulates greater output, innovation, and technology investment. The ensuing efficiency leads to reduced costs, making food more accessible and affordable for all consumers. Furthermore, this approach optimizes supply and demand align-

ment, minimizing waste and enhancing resource distribution. For instance, farmers can offer varying quality produce at varying prices to cater to different consumer preferences [28].

However, price discrimination can also result in negative effects on the betterment of society as a whole. It can lead to inequality and unequal access to goods and services, as some consumers may be excluded from certain markets or may not be able to afford higher-quality produce. The reduced market competition can lead to higher prices for consumers in the long run [29].

Besanko [30] studied a scenario where ketchup was sold at a fixed price for everyone. They then looked at what would happen if companies could figure out which customers might be more or less willing to pay for their product. Surprisingly, they discovered that when companies could charge different prices to different types of customers, it didn't lead to a fierce price war. It not only improved social benefits but also effectively boosted the companies' profits.

Brenkers and Verboven [31] examined a situation where car manufacturers were charging different prices to customers from different countries. However, in the future, they wouldn't be able to do this because of improved market integration. We may assume that this would lead to intense competition because domestic and foreign firms have opposite strengths and weaknesses in their respective markets. Surprisingly, their findings showed that eliminating price discrimination didn't result in an all-out price war. Instead, it caused prices for domestic firms to go down while prices for foreign firms went up. The impact on industry profits and overall social welfare was relatively modest unless high prices in the United Kingdom were a result of collusion among companies.

Some of the benefits of price discrimination for the whole society are illustrated below.

#### **3.6.1. Availability of high-cost essential services**

For goods and services that are essential to society as a whole but whose production is not profitable because of falling long-run average costs much above the average demand curve, price discrimination is socially justifiable.

In most public services, such as transportation services and post office services, this kind of

condition arises. In this kind of situation, higher-paying groups subsidize the lower-paying groups. The production of these essential goods and services is possible only because of the subsidy provision provided to lower-income groups by higher-income groups [10].

### **3.6.2. Maintaining equity in the consumption of public goods**

In our society, there is an unequal distribution of income. So, the unequal distribution of goods may have a positive effect on lower-income people. When the higher price is charged to the higher income group and the lower price is charged to the lower-income group, the redistributed effect benefits the poor at the expense of the rich. For instance, when hydroelectricity projects are initiated, industry owners benefit more than households, and European countries benefit more than African nations from the uniform pricing of pharmaceuticals. Under these circumstances, uniform pricing cannot be socially justified [10].

In the agricultural sector, public goods may include farming extension services, efforts to conserve soil and water, and research and development projects that benefit both farmers and society. In order to ensure that all farmers, regardless of their level of income or the size of their operation, can access these public commodities, price discrimination is a necessary step. For example, the agriculture extension service may offer training programs or workshops with sliding scale fees so that farmers with limited resources can still attend. Similar to this, study organizations might provide small farmers with discounted rates for seeds or plant materials, ensuring that they have access to the newest varieties and innovations.

To maintain equality among different income groups, price discrimination plays a great role. As it promotes social equity, price discrimination is justified socially. However, in the absence of optimal allocation of resources and distributive efficiency, price discrimination is not desirable [28].

### **3.6.3. Availability of essential services to low-income groups**

When a single price is applied uniformly to everyone, it can lead to low-income individuals being unable to afford essential goods and services. This is particularly true when there is a monop-

oly on the product or service, such as in the case of electricity, where higher-income individuals can afford to use more while lower-income individuals are unable to use any. This results in a waste of resources, particularly in the case of hydroelectricity, causing social harm. Therefore, price discrimination can help improve social welfare by ensuring that everyone can access essential goods and services at a price they can afford [10].

Price discrimination in agriculture can enhance affordability for low-income consumers. Farmers markets might provide discounts or sliding-scale pricing, making healthy food accessible. This approach aids small and local farmers against bigger competitors and caters to niche markets, potentially boosting profitability through premium pricing for sustainable or locally sourced goods [28].

## **4. Conclusion and policy implications**

The most common type of price discrimination seen in our society is third-degree price discrimination. The social eligibility of third-degree price discrimination has been an important topic of discussion and research for many years. Some economists consider it a good policy, and others disagree. Price discrimination has both social benefits and harm. Price discrimination is harmful to society when there is an ineffective distribution of resources in society between different consumers or users, which results in a minimization of the output, employment, and income. It causes a deviation of the resources from social optimum utilization. Similarly, there will be a waste of resources, and people should pay more for a small quantity. In most cases, price discrimination results in a loss of social welfare because, for most consumers, the price of the product is more than the marginal cost of supply. When discrimination occurs in a situation of falling average costs, it becomes advantageous to consumers and gives a larger output to the market. Some of the consumers benefit because they can buy the product at a lower price. Consumers with lower incomes are priced into the market if the suppliers charge them less money.

The study of price discrimination and its role in social welfare gives an idea about introducing price discrimination in the formulation of policy that helps in ensuring the adequate supply of

high-cost essential services, making the availability of high-cost essential services available to low-income groups, and ensuring cost-benefit equity in the consumption of public goods. Its study helps us formulate policies to improve social welfare.

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# Economic Factors Influencing Housing Prices in Pakistan

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## ABSTRACT

The **aim** of this research is to explore the factors influencing housing prices in Pakistan. The author used monthly time series **data** for the period from 2011 to 2020, which were obtained from different sources: housing prices data from zameen.com, Karachi interbank offered rate (KIBOR) as a proxy for monetary policy, consumer price index as a proxy for inflation, and exchange rate data from the State Bank of Pakistan. Various **methods**, such as autoregressive distributed lag (ARDL), comparative analysis and deductive analysis were employed. Before using the ARDL technique, a proper lag length was selected, which turned out to be 11 months. Various diagnostic tests indicated model stability with no autocorrelation or structural breaks. The author **concluded** that the KIBOR rate negatively affected housing prices, while inflation and exchange rates affected house prices positively.

**Keywords:** monetary policy; housing prices; inflation; exchange rate; ARDL; Pakistan

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ОРИГИНАЛЬНАЯ СТАТЬЯ

# Экономические факторы, влияющие на цены на жилье в Пакистане

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## АННОТАЦИЯ

**Целью** данного исследования является изучение факторов, влияющих на цены на жилье в Пакистане. Автор использовал ежемесячные данные за период 2011–2020 гг., которые были получены из разных источников: данные о ценах на жилье, публикуемые на сайте zameen.com, ставка межбанковского предложения в Карачи (KIBOR) как показатель денежно-кредитной политики, индекс потребительских цен в качестве показателя инфляции и данные о валютном курсе государственного банка Пакистана. Были использованы различные **методы**, такие как метод авторегрессии и распределенного лага (ARDL), сравнительный анализ и дедуктивный анализ. Перед использованием метода ARDL была выбрана подходящая продолжительность лага, которая составила 11 месяцев. Различные диагностические тесты показали устойчивость модели, отсутствие автокорреляции и структурных разрывов. Автор пришел к **выводу**, что ставка KIBOR отрицательно влияет на цены на жилье, в то время как инфляция и обменный курс влияют на цены на жилье положительно.

**Ключевые слова:** денежно-кредитная политика; цены на жилье; инфляция; обменный курс; ARDL; Пакистан

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## 1. Introduction

Across the world, upholding prices and safeguarding financial system stability are the main objectives of central banks. Low and stable inflation, a precondition for supportable economic growth, reflects effective monetary policy. It ensures business' and individuals' decision-making ability pertaining to saving, investment and consumption, which leads to a spillover effect on employment and economic growth in the long run, thus enlightening the whole economic welfare of the state. In prior investigations, it was found that monetary policy had an impact on the residential housing sector due to credit availability. It influenced the cost and accessibility of credit, altering consumer debt levels and current housing demand [1]. House prices are heavily influenced by credit availability [2]. It has also been observed in developed nations such as the USA, UK and Japan that liberalization and easy accessibility of credit are sources of billow house prices. Monetary policy fluctuations affect real estate prices through numerous channels [3].

A tight policy rate lowers inflation while raising the after-tax user cost of housing [4]. Higher user costs reduce housing demand, which leads to reduced output. On the supply side, a tight policy rate of the central bank may have an immediate impact on housing building costs, resulting in a reduction in real estate output. On the other side, through the excess reserves ratio, a state bank can influence how much money banks have to provide loans by employing monetary policy tools such as open market operations, utilizing government bonds and the central bank's discount interest rates on loans to private sector banks. If the state bank tracks a loose policy rate, for instance, the supply of credit (money) will expand, lowering market interest rates and the decrease in mortgage interest rates will enhance demand for houses, resulting in an increase in housing values [5].

The reason behind the study of monetary policy and its impact on housing prices in Pakistan is that the residential sector is rapidly expanding in Pakistan. Annually, Pakistan spends roughly US\$ 5.2 billion on building, accounting for nearly 2% of the country's gross domestic product (GDP), according to the Pakistan Bureau of Statistics. The real estate sector's total value is US\$ 700 billion,

and the tendency to purchase luxury apartments and houses increased by 7–9% in the beginning of the twenty-first century, according to the Federal Bureau of Revenue<sup>1</sup> (FBR). According to the country's twelve-monthly Economic Survey, apartment prices have increased by more than 120 percent from 2010 to 2016. It has been also observed that the newspaper opinion writers and many bankers claimed that buyers borrow money from financial institutions and invest in property instead of investing in their other businesses because the return on investment in property is significantly larger than the rate of interest they must pay to financial institutions on loans because of rising house prices [6].

People desire to protect their future and invest in Pakistan's real estate market. However, due to the previous government's high taxation on the real estate industry, investment tendencies in real estate have diminished. Even as foreign direct investment diminishes and infrastructure funding remains tight, Pakistan's real estate market contributes significantly to economic growth. The real estate sector accounts for 60–70 percent of the country's wealth, or around USD 300–400 billion, according to World Bank estimates. After agriculture, it is Pakistan's second-largest source of employment. Apart from direct employment, it boosts demand in over 400 different industries, such as construction, steel, cement, paint, architecture, building materials, etc. As the government has increased the amount of taxes, particularly in the areas of purchasing and selling, severe measures have been realized behind investments made in the last three years. As a result, this industry has been hit hard by the recession; numerous real estate consulting offices have closed, and many people who worked in this field are now starving [7].

The FBR's severe rules (ban on non-filers, mandatory registrations when purchasing property worth more than PKR 5 million (Pakistani rupee), and expensive property transfer taxes) have deterred investors in this field. Even though financial markets are volatile, it isn't the economic signal one might imagine. However, a common misconception about real estate as an investment option is that it makes a lot of money. This is not the case. The real estate sector fills the void in most nations

<sup>1</sup> Federal Bureau of Revenue (FBR). Pakistan. 2018.

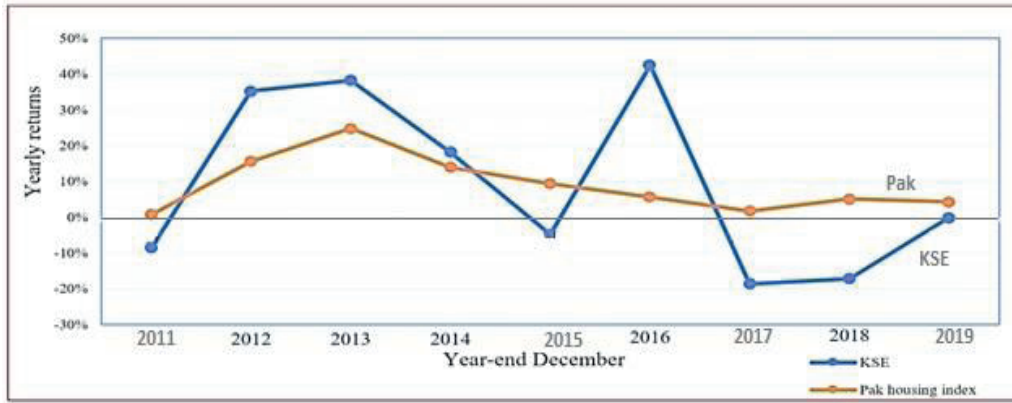


Fig. 1. The KSE-100 Index and the returns of Pakistan's Housing Index

Source: Pakistan Stock Exchange. www.zameen.com

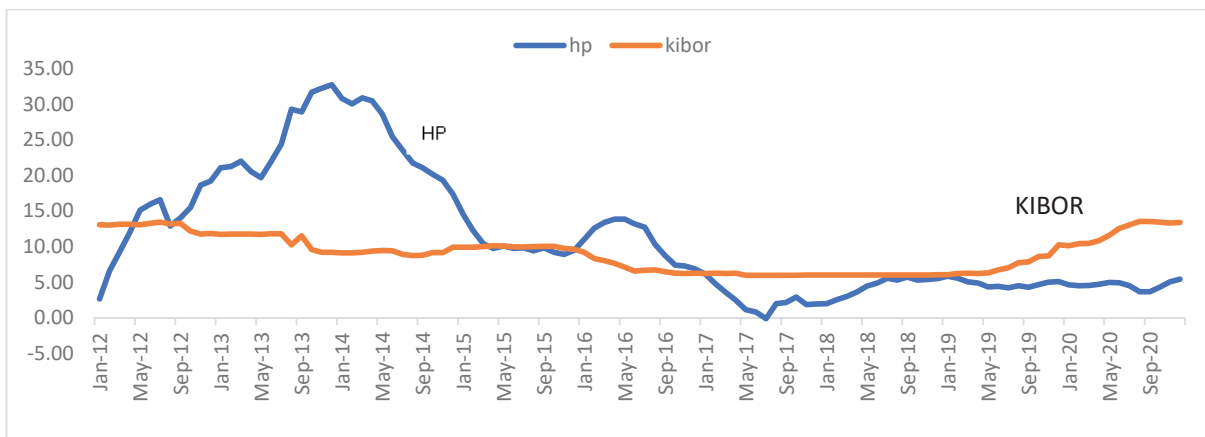


Fig. 2. Monetary policy and house prices from 2012M1 to 2020M9

Source: State Bank of Pakistan and www.zameen.com (2021).

where the role of financial markets is minimal in economic growth. Unfortunately, due to excessive regulation by the government and the FBR, this industry is unable to do so. Consider the Karachi Stock Exchange KSE-100 index and the house price index (Fig. 1). For only three years between 2011 and 2019, the cumulative return on property prices was higher than the KSE-100. The KSE-100 index has climbed by 230% over the same period, compared to 147% for house prices.

Investing cycles do occur sometimes, and the real estate sector in Pakistan experienced one from 2012 through 2015, when the annual returns were 16%, 25%, and 14%. During all prior years, the return on the housing index has been in the single digits, ranging from 1% to 9%. The KSE-100 index, on the other hand, is more volatile and offers both large returns and low profitability; its best return was 42 percent, and it recorded a 19% loss in 2017. The motivation of this study is to determine whether there is an effect of the state bank policy on real estate sector or not. That is

why Fig. 1 shows how these two economic variables are changing over time. The purpose of Fig. 2 is to demonstrate the monetary policy and house prices values in general from 2012M1 to 2020M9. The Karachi Interbank Offered Rate (KIBOR) is the proxy of monetary policy and HP line represents house prices in Pakistan.

The real estate industry has struggled since the change of government in 2017. It has had to deal with financial, economic, and political difficulties, a variety of policy problems, and a lack of assurance. It barely made it through the previous recession. This is primarily because of the massive investments made by Pakistanis living abroad. Due to exchange rate gains for outside investors, the depreciation of the Pakistani rupee made property investment more affordable. Almost 30% of traffic on the website Zameen.com comes from foreign Pakistanis looking for investments, according to the website. However, investing in Pakistan's real estate market is already dangerous since the country is now ranked 120th out of 129 countries

Table 1  
Housing loan pricing

Loan Tiers	Amount	Customer Pricing	Bank Pricing
Tier 0	Rs 2 million	5% for 1 <sup>st</sup> five years and 7% for next seven years	KIBOR plus 700 BPS
Tier 1	Rs 2.7 million	3% for 1 <sup>st</sup> five years and 5% for next five years	KIBOR plus 250 BPS
Tier 2	Rs 6 million	5% for 1 <sup>st</sup> five years and 7% for next five years	KIBOR plus 400 BPS (Spread may vary)
Tier 3	Rs 10 million	7% for 1 <sup>st</sup> five years and 9% for next five years	

Source: State Bank of Pakistan. URL: <http://www.sbp.org.pk/fsr/index.htm>

(with a score of 3.9/10). For international investors, this type of ranking is quite crucial. Thousands of foreign investors have moved their money elsewhere because of the uncertainties and tax policy. Because some nations (such as the United Arab Emirates and the United Kingdom) are providing stronger incentives, the amount of foreign exchange used to invest in real estate has declined.

Pakistan received USD 21.84 billion in remittances because they face constraints in doing other businesses, most international investments are in the real estate sector. Overregulation of the property market discourages foreign investment, which decreases remittances to Pakistan. Furthermore, the government's stance of not using development budgets has caused this sector's activity to decline.<sup>2</sup> The demand for consumer loans has expanded significantly, owing mostly to the construction of new homes. As a result, compared to the previous year, house construction loans increased by 17.2%. The State Bank of Pakistan's (SBP) obligatory objectives for banks to boost building and construction loans are likely to be the cause of this higher growth. The SBP has implemented several steps to promote housing finance, in keeping with the government's goal of providing affordable housing to all citizens of the country [8].

Banks have been given required targets to lend mortgage loans and finance to developers and builders by the SBP and have also presented the means through the Government's Mark-Up Subsidy Scheme (G-MSS). In order to encourage affordable housing schemes among the lower and

middle groups, this program offers supported financing to those who don't even have a house. The government has set aside Rs 36 billion for the payment of mark-up subsidies over a ten-year period. The Pakistani government has changed and reduced the rates of mark-up subsidy schemes for housing finance, as shown in *Table 1*.

The rest of the article is structured as follows. Section 2 describes the methodology of the study. Section 3 provides an evaluation of the related literature on the association of housing prices with monetary policy, both theoretically and empirically. Section 4 explains the econometric method. Section 5 offers results and discussion. Finally, Section 6 outlines the conclusions and recommendations of the research.

## 2. Methodology of the study

### Problem statement

Only one published study has been found to be directly related to current research. That study concluded that monetary policy affects housing prices in Pakistan. Furthermore, housing prices drop when the policy rate is too low, and vice versa. Prior research has found that stock market index fluxes have no effect, while high level inflation increases house prices [6]. Also, no research has been conducted in Pakistan on the effect of monetary policy on housing prices. The housing market is integrated with several other economic factors. As a result, growth in housing market activity may increase aggregate demand, placing higher stress on the value of commodities. Furthermore, house rent is directly linked to house prices, and it accounts for a significant portion of the consumer price index (CPI); in-

<sup>2</sup> State Bank of Pakistan. URL: <https://www.sbp.org.pk/reports/annual/arFY 20/Complete.pdf> (accessed on 20.07.2023).



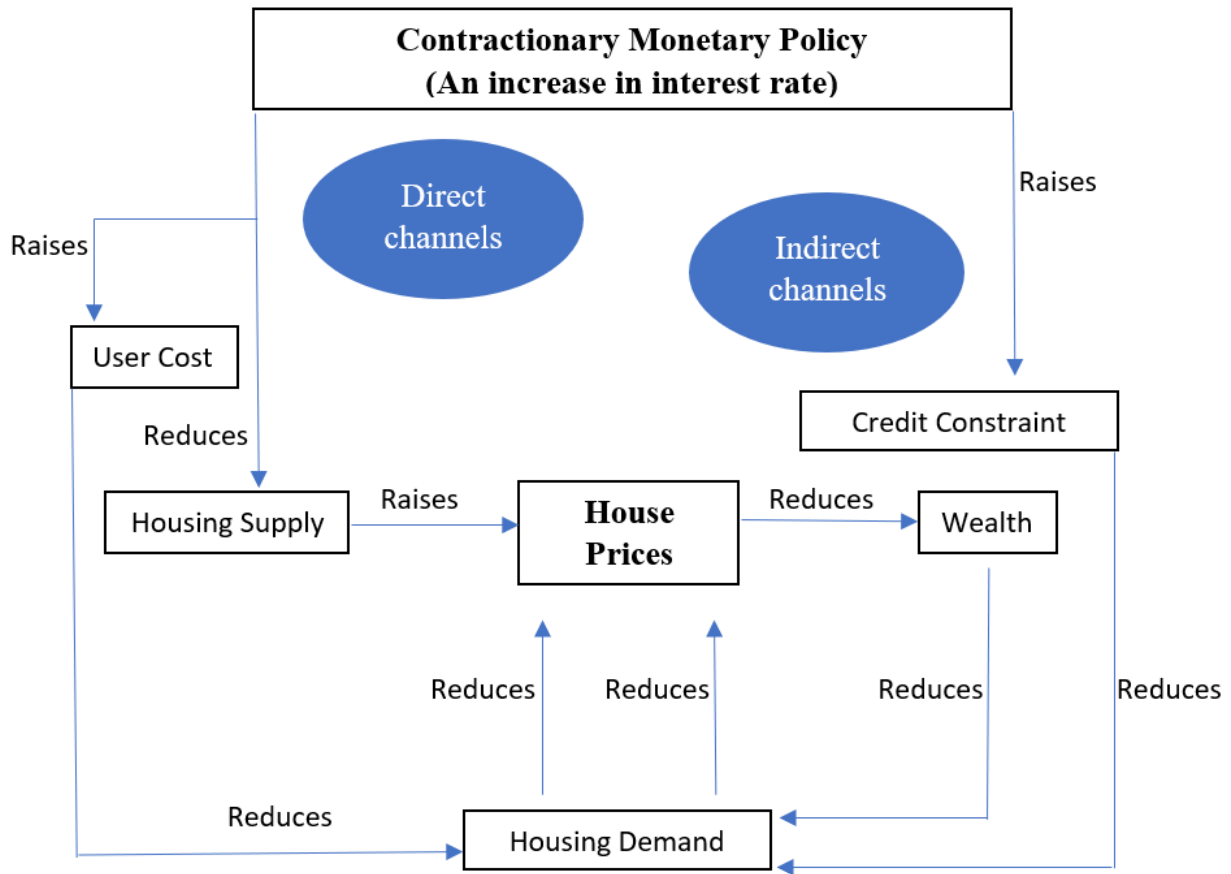


Fig. 3. A flow diagram of a detailed theoretical framework

Source: Based on Wadud et al, 2012 [11].

creases in house prices are reflected quickly in the CPI. Because of these qualities, central banks react to rising house prices more swiftly than stock prices. However, central banks usually respond to asset prices indirectly through their responses to economic activity and inflation [9].

### Research Gap

The above-mentioned studies disclose the effect of monetary policy on house prices through different channels. The current study is investigating this area from a new aspect — a methodology called Auto Regressive Distributed Lag (ARDL). This methodology considers ways to overcome the short- and long-run co-integration among the variables [10], and therefore, this study attempts to enrich the existing literature and to overcome the effect of monetary policy on house prices in Pakistan so that policy makers and investors could make better decisions.

### Relevance of the research

The scope of property value is increasing globally due to the increase in population. Keeping in

view the importance of monetary policy and how it affects housing prices in Pakistan, this activity became a motivating point of this research work. Therefore, the current study investigates the effect of monetary policy on housing prices in Pakistan. The reaction of the policy rate is necessary to understand various economic variables, just like housing prices. This leads to improved policymakers' decisions by employing the contractionary or expansionary policy rate, and it is possible by exploring the effects of the new economic variables related to the policy rate. The linkage between monetary policy and housing prices is given in Fig. 3, which is proposed by [11].

### Objectives of the study

In any economy, monetary policy plays a major role. That's why it is necessary to catch on to the impact of this policy rate at the bottom level. Globally, much research has been conducted to estimate the monetary policy impact on other economic indicators. But there are many other economic variables that have transmission effects related to monetary policy. The objective

of this study is to investigate the impact of monetary policy on housing prices in Pakistan.

### Research questions

1: Is there any relationship between house prices and monetary policy in Pakistan?

2: What is the effect of monetary policy on house prices in Pakistan?

3: Does the monetary policy affect house prices in Pakistan?

### Research hypotheses

The null and alternative hypotheses of the study set as:

*H0*: Monetary policy does not affect house prices.

*H1*: Monetary policy affects house prices.

### Contribution of the study

Academic scholars, policymakers, and media commentators have recently focused their attention on the impact of the housing sector on economic activity. The need to analyze the possible implications for financial system stability is partly justified by the considerable increase in housing prices and consumer debt in various industrialized countries during the last decade. There is minimal study done on the term "housing prices" and the impact of policy rate in Pakistan, and their conclusions specify the link of monetary policy with housing prices based on a very small body of research [6]. In terms of future research, the current study will condense this gap and work on the most recent data on Pakistan to hit upon the association of monetary policy and houses prices. The current study's outcome contributes knowledge to policymakers in the area of expansionary and contractionary policy rates, explaining which policy will have a considerable effect on the fluctuations of housing prices.

## 3. Literature review

### Literature on the determinants of housing prices in Pakistan

The vector autoregressive (VAR) model was used to determine the effect of monetary policy on housing prices in Pakistan while taking data from January 2011 to December 2016. The study further demonstrated that tight policy rates lead to lower house prices. It was also discovered that an increase in inflation results in higher hous-

ing prices [6]. The role of monetary policy in asset price transmission and good price transmission was also studied. Stock prices, property prices, and the Forex rates are all included in the asset price index. Monthly data on GDP, inflation, interest rates and asset prices were used for the period from 2000M01 to 2019M06. A VAR model was employed to select lags using likelihood ratio statistics. According to the findings, housing prices are directly connected to house rent, which has a major weight in the CPI, and increases in housing prices are swiftly reflected in the CPI. As a result, state banks respond more quickly to rising housing prices than stock prices. However, state banks respond to asset values indirectly through inflation and economic activity [9].

### Global literature on the determinants of housing prices

The real estate market is becoming a challenging area because of numerous factors. The main factor that could be considered is the size of the population, and it is a universal fact that the population is increasing every day. Similarly, when population increases, the demand for consumable goods increases in every sector. Real estate is one of these. Various studies explored the impact of monetary policy at the general level, however, the current study investigated more detailed dependences, such as the linkages of housing prices, and found that monetary policy affects housing demand through credit availability and is considered a key predictor of housing prices [2]. Similarly, the ease of access to credit was responsible for the surge in housing prices in developed countries such as Japan, the United Kingdom, and the United States [12]. Changes in the policy rate affect real estate values through a variety of channels. A tight policy rate reduces the rate of inflation and pushes the user cost of housing upward. As a result, when user costs become high, it reduces housing demand, and, at the end, housing prices and productivity decline [3]. A contractionary monetary policy, in the eyes of the supply side, might have an immediate impact on house building costs and decrease the activity of housing output [4].

Many scholars have investigated monetary policy transmission channels, concentrating on how the economy is affected by monetary policy,

specifically, how the policy rate affects various asset prices. Monetary policy has a transmission effect on asset prices, which contribute to the economy. Therefore, due to a healthy policy rate, economic growth can be achieved [13]. The author [14] used quarterly data on the United States from 1987 to 2007 and employed Factor-Augmented Vector Autoregressive model (FAVAR) to explore monetary transmission and suggested long-run relationships between the policy rate and housing prices.

Data for the period 1986–2008 revealed residential property prices and their response to the monetary policy rate in 18 countries. According to panel VAR, the effect of the policy rate was measured and revealed that housing prices are broadly related to economic activity [15].

Monetary policy is a precious tool that protects the economy and brings financial stability. The study [15] found the variation in housing prices due to the policy rate and furthermore explained the real estate sector given its large portion in GDP. All these things will be possible with the help of a feasible policy rate.

To compare the effect of the policy rate on housing prices, the current study also looked at developed and developing countries because these countries mostly differ in nature. In the United States and Eurozone, property markets were examined with the help of structural vector autoregression (SVAR) method, which suggests that monetary policy shocks affect housing prices due to the transmission effect, and the Eurozone was more clearly affected by this shock [16].

On the other hand, to showcase a developing country, real estate demand and its pricing fluctuations were tested for China. China is a developing country that makes a large contribution to the world's economy. The study [17] observed outcomes by using monthly data from 1998 to 2009 and came up with evidence that, in the case of China, monetary policy had an impact on housing prices. This observation was made based on both the contractionary and expansionary policy rates and suggested that the expansionary policy rate increases housing prices. The tight policy rate had a negative influence on Chinese property prices, particularly in large cities [18].

If the state bank applies an expansionary policy that increases the amount of money by providing loans at a low interest rate. When the mortgage

interest rate falls, the demand for housing increases, and as a result real estate market activities move faster [5].

Colombian housing prices were examined for the period 1994–2015 with the help of the Markov switching model. According to empirical findings, a contractionary monetary shock reduces house price growth by a bigger magnitude in high-volatility periods than in low-volatility periods. This shows that monetary policy is more successful in lowering house price growth during times of crisis than when the economy is doing well [19]. In Turkey, the dynamic relationship between property prices, income, interest rates, housing permits, and stock prices was studied by using structural vector autoregressive (SVAR) models, which were employed for monthly and quarterly data and applied using four distinct SVAR models to reveal this dynamic link between 2003 and 2016. The study found statistically significant and considerable connections between the variables, leading to the conclusion that home prices and housing permits are highly sensitive to monetary policy and income shocks as housing market variables [20]. Mortgages influence housing demand because the liquidity of money is boosted by the selling and purchasing of houses [21]. The negative effect of higher interest rates on property values is bigger than the effect of lower interest rates [22]. Since the 1980s, researchers have been studying the effects of monetary policy, with most studies relying on vector autoregressions (VARs). To avoid some of the specification issues of VARs, the study employed the local projection method and showed a clear effect of monetary shocks on housing variables.

Most of the prior studies support the idea that the policy rate has a transmission effect on housing prices, but it is claimed [23] in the case of Turkey that the Turkish economy does not have a transmission effect on housing prices. The study employed the VAR model for empirical analysis, which covered the period of monthly data from 2010 to 2019. The findings reveal that monetary policy has an impact on housing prices, but the impact of housing prices on housing investment, the industrial production index, and inflation is not statistically significant. The Turkish economy does not have a housing price transmission channel, according to the findings [23]. In the case of India, it is suggested that the role of monetary

policy or policy rate is slightly affecting Indian real estate prices, and that 13 percent of the variation occurs due to policy rate in a 10-month period [24].

According to empirical data, the high level of variation in interest rates affects different countries' housing prices, such as Belgium, the Netherlands, Canada, Denmark, South Africa, Switzerland and Sweden. Financial liberalization influences the connection between housing prices and monetary policy, but that response varies in different nations. Interest rate shock appears to play a significant role in Australia, Ireland, Spain, the Netherlands, the United States, and South Africa. During 2002–2006, monetary policy shocks were responsible for almost 24 percent of house price increases in the United States. Finally, the research found indications that state banks respond to housing prices through inflation-targeting policies [25].

**Summary of the literature**

Recent studies have revealed that housing prices broadly relate to economic activity, and monetary policy is considered a precious tool that protects the economy and brings financial stability. According to many studies, house prices increase due to expansionary policy. While contractionary policy rates reduce them.

**4. Data and methods**

**Data description and conceptual framework**

The current research is based on monthly time series data that span the period from 2011M1 to 2020M12. The study took the dependent variable, housing prices (HP), from the www.zameen.com website and made calculations in average per square foot prices for major cities. The control variable is Karachi Interbank Offered Rate (KIBOR), which is used as proxy of monetary policy taken from (SBP) state bank of Pakistan. Some reports (particularly, [26]) utilize the discount rate as a proxy for policy, which is not appropriate for analysis. Furthermore, in Pakistan, the committee on monetary policy meets every two months, and rarely revises the discount rate. As a result, the discount rate is an ineffective monthly indicator of monetary policy [9]. The data of consumer price index (CPI), the proxy for inflation (INF) and exchange rate (EXR) have been taken from SBP (State bank of Pakistan).

**Specification: ARDL model**

The current study adopted autoregressive distributed lag (ARDL) and bound testing approach to sort out the movement of dependent and independent variables in long and short run. According to many researchers, this model is used for the purpose of co-integration among the variables [27]. As per the assumption of this model, the variables must be stationary at order I(0) and I(1) [28]. The ARDL model is regarded as the best econometric technique compared to others, but it fails when the order of I(2) is present in any variable. Based on the study purpose, the current study will also use the ARDL approach to analyze the co-integration between house prices and monetary policy with some other variables of Pakistan, as shown in Fig. 4.

The generalized ARDL (p, q) model is given below to understand the relationship between both dependent and independent variables:

$$Y_t = \gamma_{oi} + \sum_{i=1}^p \delta_i Y_{t-i} + \sum_{i=0}^q \beta_i X_{t-i} + \epsilon_{it}, \quad (1)$$

where  $Y_t$  is a vector and the variables in  $X_t$  are allowable to be purely I(0) or I(1) and  $\beta$  and  $\delta_i$  are coefficients;  $\gamma$  is the constant;  $i = 1, \dots, k$ ; optimal lags are  $p$  and  $q$  order;  $\epsilon_{it}$  is the error term.

In the empirical methodology, the current study will disclose the impact of monetary policy on housing prices with the help of the ARDL model. This model is widely employed when variables are in different order or not stationary [10]. To determine the long- and short-run linkages among any dependent and independent variables, this model is considered the best. Furthermore, equation two shows the general model which consists of the current study variables.

$$HP_t = a_0 + a_1 KIBORE + a_2 INF + a_3 EXR + e_t, \quad (2)$$

where  $HP$  represents houses prices, while  $t$  signifies the time period from 2011M1 to 2020M6;  $a_0$  signifies the constant; while  $a_1$  to  $a_3$  are the coefficients of variables; KIBORE (Karachi Interbank Offered Rate) signifies monetary policy; INF denotes inflation and EXR is representing the exchange rate; while  $e_t$  signifies the error term. To perform the bound test for cointegration, the conditional ARDL ( $p, q_1, q_2, q_3$ ) model with the four variables is specified as:

$$H_o : a_{1i} = a_{2i} = a_{3i} = a_{4i} = 0,$$



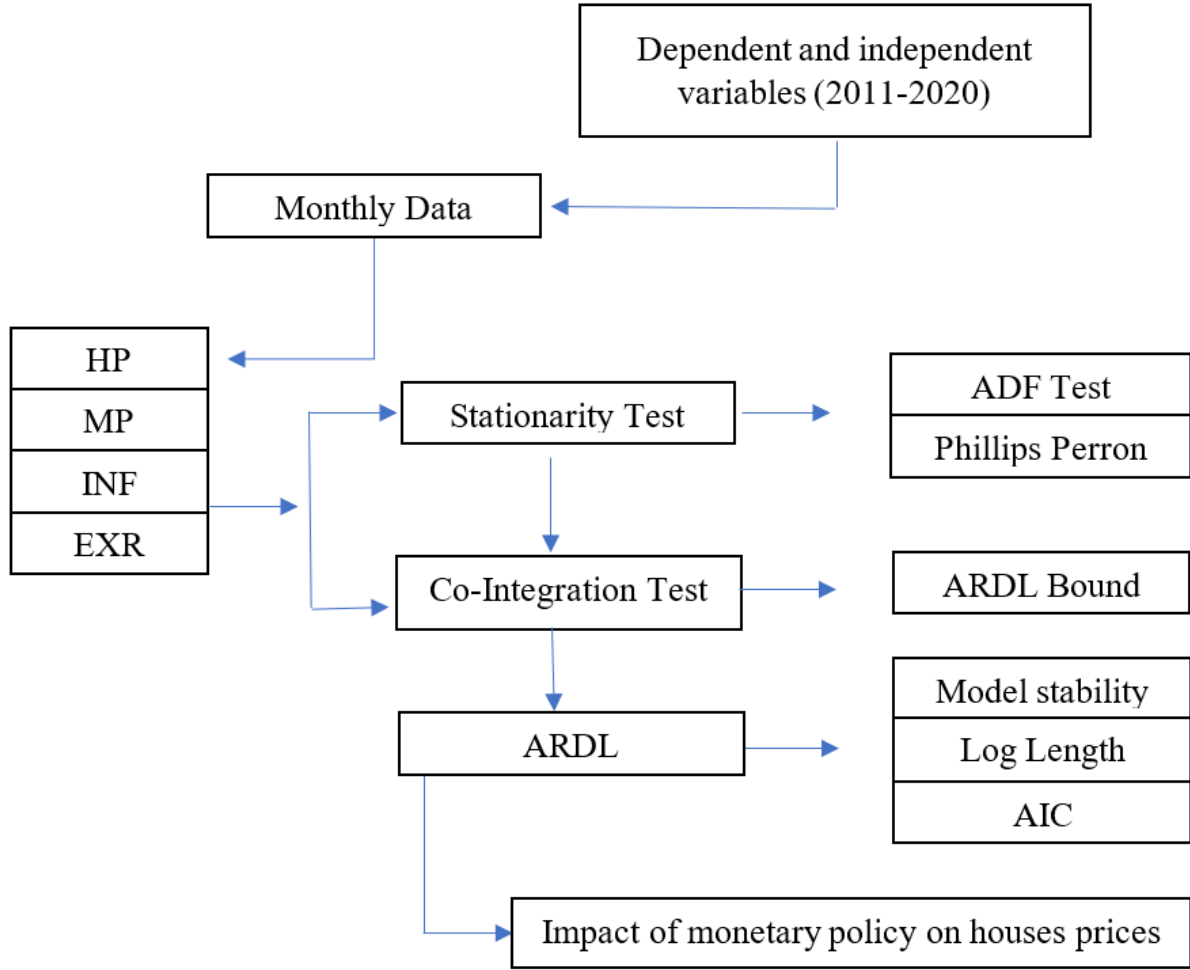


Fig. 4. A conceptual framework

Source: Naikoo et al., 2021.

where  $i = 1, 2, 3, 4$ .

$$H_1 : a_{1i} \neq a_{2i} \neq a_{3i} \neq a_{4i} \neq 0,$$

$$\begin{aligned} \Delta HP_t = & a_{01} + a_{11}\Delta HP_{t-1} + a_{21}\Delta KIBORE_{t-1} + a_{31}\Delta INF_{t-1} + a_{41}\Delta EXR_{t-1} + \\ & + \sum_{i=1}^p a_{1i}\Delta HP_{t-i} + \sum_{i=1}^q a_{2i}\Delta KIBORE_{t-1} + \sum_{i=1}^q a_{3i}\Delta INF_{t-1} + \sum_{i=1}^q a_{4i}\Delta EXR_{t-1} + e_{1t}, \end{aligned} \quad (3)$$

$$\begin{aligned} \Delta KIBORE_t = & a_{02} + a_{12}\Delta HP_{t-1} + a_{22}\Delta KIBOR_{t-1} + a_{32}\Delta INF_{t-1} + a_{42}\Delta EXR_{t-1} + \\ & + \sum_{i=1}^p a_{1i}\Delta HP_{t-i} + \sum_{i=1}^q a_{2i}\Delta KIBORE_{t-1} + \sum_{i=1}^q a_{3i}\Delta INF_{t-1} + \sum_{i=1}^q a_{4i}\Delta EXR_{t-1} + e_{2t}, \end{aligned} \quad (4)$$

$$\begin{aligned} \Delta INF_t = & a_{03} + a_{13}\Delta HP_{t-1} + a_{23}\Delta KIBORE_{t-1} + a_{33}\Delta INF_{t-1} + a_{43}\Delta EXR_{t-1} + \\ & + \sum_{i=1}^p a_{1i}\Delta HP_{t-i} + \sum_{i=1}^q a_{2i}\Delta KIBORE_{t-1} + \sum_{i=1}^q a_{3i}\Delta INF_{t-1} + \sum_{i=1}^q a_{4i}\Delta EXR_{t-1} + e_{3t}, \end{aligned} \quad (5)$$

$$\begin{aligned} \Delta EXR_t = & a_{04} + a_{14}\Delta HP_{t-1} + a_{24}\Delta KIBORE_{t-1} + a_{34}\Delta INF_{t-1} + a_{44}\Delta EXR_{t-1} + \\ & + \sum_{i=1}^p a_{1i}\Delta HP_{t-i} + \sum_{i=1}^q a_{2i}\Delta KIBORE_{t-1} + \sum_{i=1}^q a_{3i}\Delta INF_{t-1} + \sum_{i=1}^q a_{4i}\Delta EXR_{t-1} + e_{4t}. \end{aligned} \quad (6)$$

If there is no cointegration, the model of ARDL ( $p, q_1, q_2, q_3$ ) specified as:

$$\Delta HP_t = a_{01} + \sum_{i=1}^p a_{1i}\Delta HP_{t-i} + \sum_{i=1}^q a_{2i}\Delta KIBORE_{t-1} + \sum_{i=1}^q a_{3i}\Delta INF_{t-1} + \sum_{i=1}^q a_{4i}\Delta EXR_{t-1} + e_{1t}, \quad (7)$$

where the difference operator  $\Delta$  is used. The F-test and the coefficient of lagged variables are included in the test to ensure that the variables have a long-term relationship. The null hypothesis is “no long-term relationship between the variables” [27]. The following requirements must be met before the conclusion on  $H_0$  can be accepted or rejected. If the value of the “F” test is larger ( $>$ ) than the upper critical bound (UCB), then  $H_0$  will be rejected, which implies that the study variables are moving together or cointegrated. Similarly, if the value of the “F” statistic test is lower ( $<$ ) than the lower critical bound (LCB), then accept  $H_0$ , and this condition signifies that the study variables are not cointegrated. Though, if the value of F-test  $<$  UCB and greater ( $>$ ) from LCB, this condition’s result will be unsatisfying. If there is cointegration, the error correction model (ECM) representation is specified as:

$$\Delta HP_t = a_0 + \sum_{i=1}^p a_{1i} \Delta HP_{t-i} + \sum_{i=1}^p a_{2i} \Delta KIBORE_{t-i} + \sum_{i=1}^p a_{3i} \Delta INF_{t-i} + \sum_{i=1}^p a_{4i} \Delta EXR_{t-i} + \lambda ECT_{t-1} + e_t. \quad (8)$$

The ECM, called the error correction term, indicates the speed adjustment required to regain equilibrium in the model. It must have a significant value and a negative sign so that the coefficient of ECM will correctly measure how soon variables regain equilibrium. The relatively significant error correction term demonstrates the presence of healthy long-run relationships.

### Unit root testing

We used Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests to check if the series data of KIBOR and housing prices are stationary in time. The ADF test employed through augmenting equation and form lagged difference of dependent variables  $\Delta Y_{t-1}$  is included as independent variables to detect serial correlation [29]. Below is the equational form of the ADF tests.

$$\Delta Y_t = y_1 Y_{t-1} \sum_{i=1}^m a_i \Delta Y_{t-i} + \mu_t, \quad (9)$$

$$\Delta Y_t = y_0 + y_1 Y_{t-1} \sum_{i=1}^m a_i \Delta Y_{t-i} + \mu_t, \quad (10)$$

$$\Delta Y_t = y_0 + Y_1 Y_{t-1} + Y_2 t + \sum_{i=1}^m a_i \Delta Y_{t-i} + \mu_t. \quad (11)$$

The error term is  $\mu_t$ , and first difference is  $\Delta Y_t$  of the dependent variable. It is necessary to run a model to check the pattern of the data series, especially in time series data. If the data are without drift and trend, then it is better to use equation one. Equation two will be used if the data series have drift but no trend, and if the data have both drift and trend, then apply equation three.

### Phillips-Perron test

$$Y_t = c + \delta t + ay_t + ay_{t-1} + e(t). \quad (12)$$

In the above equation,  $e(t)$  is the innovation process. The test assesses the null hypothesis under the model variant appropriate for series with different growth characteristics  $c = 0$  or  $\delta = 0$ .

## 5. Empirical results and discussion

### Descriptive statistics

The summary of descriptive statistics results shows that the average value of HP is 11.25275 and KIBOR average value is 9.090370. The maximum values of HP and KIBOR during the study period were 32.77500 and 13.56000, and the minimum values were  $-0.123649$  and  $5.970000$ . The standard deviations of HP and KIBOR during the study period were 8.794751 and 2.589566. The skewness values of HP and KIBOR and all other variables were zero, that depicts that the data is normally skewed. Similarly, the Kurtosis values of all variables were less than 3, showing platykurtic distribution (Table 2).

### Unit root analysis

The unit root process, or unit root, is the stochastic trend, especially in time series data, which is also known as “random walk with drift”. It is said that if the data have a unit root, the supporting results of any analysis are unpredictable. Therefore, to obtain predictable results, it is important to check the unit root process, and that is possible with the help of ADF and PP tests. These tests are well known for the purpose of determining the unit root. The ADF test also avoids the issue of serial correlation. Furthermore, PP is the modified form of the ADF test, and the main advantage of the ADF test is that it corrects the problems of heteroscedasticity and autocorrelation [29, 30].

Table 2  
Descriptive Statistics

Variables	HP <sub>t</sub>	EXR <sub>t</sub>	KIBOR <sub>t</sub>	INF <sub>t</sub>
Mean	11.25275	7.538458	9.090370	6.919444
Median	8.839951	5.782852	9.210000	6.700000
Maximum	32.77500	30.52106	13.56000	13.90000
Minimum	-0.123649	-5.732753	5.970000	1.300000
Std. Dev.	8.794751	8.418928	2.589566	3.354123
Skewness	0.972346	1.039268	0.237356	0.313585
Kurtosis	2.853990	3.415812	1.740033	1.905506

Source: Developed by the author.

Table 3  
Unit root test results

Variables	Augmented Dickey-Fuller		Phillips-Perron	
	Level	First Diff.	Level	First Diff.
HP	-1.292014	-3.222470*	-1.456204	-6.214008*
KIBOR	-1.661850	-3.429310*	-1.169064	-10.92534*
INF	-1.619339	-8.374408*	-1.668041	-9.157815*
EXR	-1.768843	-7.399178*	-1.620154	-7.399178*

\*Level of significance is 5%.

Source: Developed by the author.

The current study focuses on checking the effectiveness of the policy rate impact on housing prices in Pakistan. Before using ARDL, the initial step is to run the process of unit root. If the condition is mixed order or “at level I(0)” and “first difference I(1),” then the results of the ARDL model will be accurate and supporting. But it failed in the order of I(2) (second difference of order). The results of the unit root are given in *Table 3*.

### The criteria of lag length

After examining the unit root process, the next step is to use the method of ARDL to examine the series' long-term relationship. When using the ARDL, one must choose the right lag length for the bounds test. Furthermore, the ideal lag length should be kept in mind when conducting policy analysis; an incorrect lag length can influence the results and cannot be accepted. It is necessary to ensure that the lag selection is appropriate. The Akaike information criterion (AIC) produces reliable outcomes and has excel-

lent performance. *Table 4* summarizes the findings. Lag 11 was found to be appropriate for the sample.

The polynomial graph in *Fig. 5* confirms an acceptable lag selection with the help of VAR approach. All the blue dots in *Fig. 5* are in the circle that authorizes the lag 11, and estimations would be adequate to obtain satisfactory results.

### Approach to bound testing

The Akaike information criterion was employed to choose the proper length of lags for the ARDL approach in [27]. *Table 5* summarizes the current study findings on the basis of the ARDL Bounds Test. When housing prices were set as a dependent variable, the F-statistics were found 6.486870, which is larger than UCB at 1 and 5 percent significance levels. The results of the bounds test confirm that there are cointegrating vectors, indicating the long-run connection between housing prices and the monetary policy rate in Pakistan.

Table 4  
The lag selection criteria by VAR

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-1075.84	NA	54895.11	22.26468	22.37086	22.30762
1	-502.874	1086.859	0.565387	10.78090	11.31177*	10.99555
2	-469.71	60.17334	0.397579	10.42701	11.38257	10.81339*
3	-455.14	25.23429	0.411262	10.45650	11.83675	11.01460
4	-436.316	31.04944	0.391172	10.39827	12.20323	11.12811
5	-423.104	20.70402	0.419827	10.45575	12.68540	11.35731
6	-417.696	8.028061	0.532699	10.67415	13.32849	11.74743
7	-404.017	19.17867	0.574554	10.72200	13.80104	11.96701
8	-371.614	42.75835	0.425389	10.38380	13.88753	11.80054
9	-355.329	20.14684	0.444344	10.37792	14.30634	11.96638
10	-343.89	13.20825	0.520279	10.47195	14.82507	12.23214
11	-289.792	58.00150*	0.257154*	9.686436*	14.46425	11.61835

Source: Developed by the author.

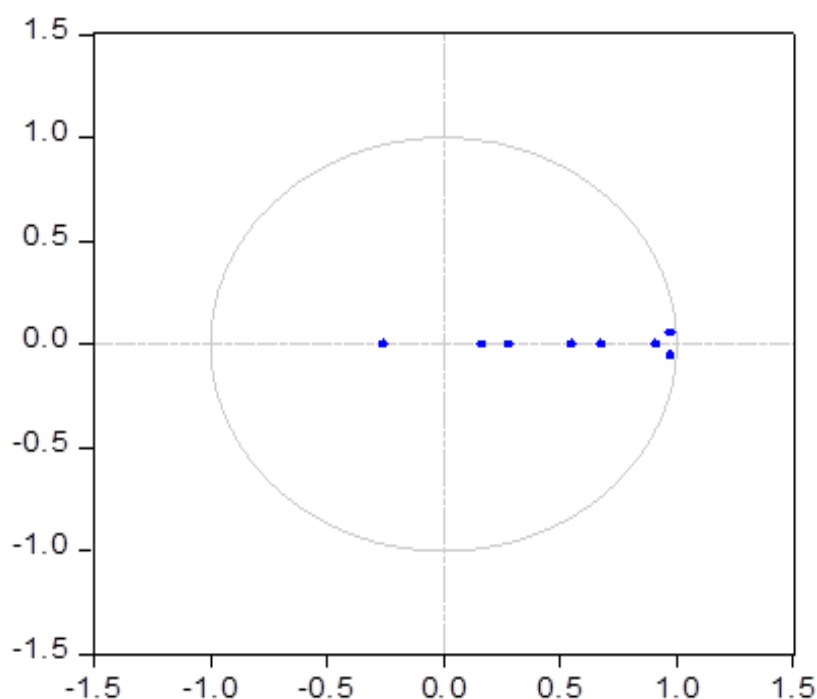


Fig. 5. Inverse roots of AR characteristic polynomial

Source: Developed by the author.

### Long-term and short-term analysis

After the confirmation of long-run cointegration between housing prices and monetary policy, this study also examines short-run association. The short-run and long-run results

are shown in *Tables 6, 7, and 8*. All explanatory factors were significantly affected by different angles on housing prices for the long-run findings (see *Table 6*). In the long run, the impact of KIBOR, according to the outcomes show-



Table 5  
F-Bounds test

Test Statistic	Value	Signif.	I(0)	I(1)
F statistic	6.486870	10%	2.37	3.2
K	3	5%	2.79	3.67
		2.5%	3.15	4.08
		1%	3.65	4.66

Source: Developed by the author.

Table 6  
Long-run results

Variable	Coefficient	Std. Error	T-Statistic	Prob.
EXR	0.50544	0.13486	3.747869	0.0005
INF	4.610777	0.68902	6.691759	0.0000
KIBOR	-3.340232	1.02079	-3.27221	0.0020
C	6.703044	5.24497	1.277994	0.2073

Source: Developed by the author.

ing negative and highly significant impact on housing prices, means that if the KIBOR rate increases HP will decrease and vice versa. Furthermore, a one percent increase in KIBOR will reduce HP by -3.340232 percent. Likewise, EXR and INF also have a highly significant and positive impact on housing prices. It is clear from the following result that 1 percent change occurring in EXR and INF will cause 0.505440 and 4.610777 percent increase in housing prices.

The short-run results (Table 7) reveal that monetary policy has a highly significant effect on housing values. It is stated that, if a 1% change occurs in KIBOR, that will cut housing prices by -0.598269 percent at lag 11. Meanwhile, the influence of monetary policy on housing prices is negative and quite significant in the case of the short run. The study shows that a 1% rise in the KIBOR has resulted in -3.34022 percent decrease in property values. The observed findings of the current paper are similar to the previous study, such as [6] in Pakistan and with general studies, e.g., [21, 31].

According to the current study hypothesis and the ARDL model, which has been tested for the purpose of investigating co-integration, the R square and adjusted R square values were found

to be 99%. These values indicate that the model is well fitted and has a strong relationship.

The error correction term ( $ECT_{t-1}$ ) is significantly negative at 1%, indicating that the imbalance can be corrected in the long-run with better speed, even if the explanatory variables have any prior-year shock (see Table 8).

We conducted a model stability test using a combination of diagnostic tests, and the current study's findings show that the ARDL model passed all the diagnostic tests. For the confirmation of high order serial correlation, the study conducted a serial correlation LM test, that validated the ARDL model having no partial correlation or autocorrelation (Table 9).

An unequal scatter of error term or residuals occurs due to heteroscedasticity. According to [32], the problem of heteroscedasticity occurs in time series data when the dependent variable series fluctuates significantly from beginning to end. The residuals in ordinary least squares (OLS) regression are assumed to come from a population with homoscedasticity, or constant variance. The outcomes of a regression analysis are difficult to trust when heteroscedasticity is present. Heteroscedasticity is a natural occurrence in datasets with a wide range of observed data values. The current study also tests this issue through the

Table 7  
Short-run result

[Variable]	[Coefficient]	[St. Error]	[t-Statistic]	[Prob.*]
HP (-1)	1.264209	0.106974	11.81787	0.0000
HP (-3)	-1.028812	0.197515	-5.208787	0.0000
HP (-4)	1.063256	0.204837	5.190728	0.0000
HP (-7)	0.566724	0.226407	2.503127	0.0157
HP (-10)	-0.341078	0.156598	-2.178043	0.0342
HP (-11)	0.211173	0.087548	2.412089	0.0197
EXR (-3)	-0.150245	0.061554	-2.440882	0.0183
EXR (-11)	0.1242	0.051959	2.390349	0.0207
INF	-0.293544	0.100569	-2.918848	0.0053
INF (-11)	-0.237523	0.108373	-2.191717	0.0332
KIBOR	-0.969189	0.234792	-4.127861	0.0001
KIBOR (-3)	-0.598269	0.273155	-2.190221	0.0333
KIBOR (-4)	0.579684	0.274094	2.114909	0.0395
KIBOR (-11)	0.50624	0.211442	2.39422	0.0205
C	0.825856	0.702025	1.176391	0.2451
R square 0.998204, Adjusted R square 0.996481				

Source: Developed by the author.

Breusch-Pagen-Godfrey test and concludes that there is no issue of hetero the observed value of R-squared is 0.8205 in *Table 10*, which is greater than 5 percent, and we reject H<sub>0</sub>.

Testing normality is a key step in data analysis. Many statistical tools rely on the assumption of normality. If the assumption is incorrect, the study may need to switch to a different statistical tool or methodology. The current study employs several different normality tests. The normality test tells us whether the sample data were taken from a normally distributed population or not, and it also checks whether the data set is well-modeled by a normal distribution. According to *Table 11*, the normality test, the data are normal, and the probability value is more than 5%, so we reject H<sub>0</sub> and accept H<sub>1</sub>. H<sub>0</sub> denotes that the data are not normal.

Meanwhile, to evaluate the stability of the long- and short-run parameters, this study used two stability tests, CUSUMSQ and CUSUM (see *Fig. 6* and *7*), these stability tests were proposed by [33]. The blue lines of *Fig. 6* and *7* are signifi-

cantly between critical borders at the level of 5%, as shown in the graphs of both stability tests over the period 2011M1–2020M6, indicating the accuracy of long- and short-run characteristics that influence housing prices.

## 6. Conclusions and recommendations

An effective financial system is essential to a country's economic growth and development. Savings are turned into investments through the financial system. It provides a safe environment for doing economic transactions while also assisting in a seamless and timely manner. The rapid increase in population is creating a different level of demand in any economy. A similar pattern can also be observed in demand for housing, which has been found to be directly related to the increase in population and changes in monetary policy.

Monetary policy has been a major tool at the central bank's disposal to stabilize demand. In Pakistan, there has been a significant imbalance between supply and demand in the housing mar-

Table 8  
The error correction model (ECM) results

[Variable]	[Coefficient]	[Std. Error]	[t-Statistic]	[Prob.]
D (HP (-1))	0.387416	0.095486	4.057288	0.0002
D (HP (-2))	0.384964	0.114435	3.364051	0.0015
D (HP (-3))	-0.64385	0.115737	-5.56302	0.0000
D (HP (-4))	0.419408	0.111678	3.755516	0.0005
D (HP (-6))	-0.30499	0.122229	-2.49524	0.0160
D (HP (-7))	0.261733	0.124512	2.102076	0.0407
D (HP (-10))	-0.21117	0.079347	-2.6614	0.0105
D (EXR (-1))	-0.09794	0.037128	-2.6378	0.0112
D (EXR (-3))	-0.16994	0.040822	-4.16298	0.0001
D (EXR (-5))	-0.08869	0.043089	-2.05834	0.0449
D (EXR (-7))	-0.09237	0.037821	-2.44231	0.0182
D (EXR (-8))	-0.13328	0.042175	-3.16018	0.0027
D (EXR (-10))	-0.1242	0.045016	-2.75903	0.0081
D (CPI)	-0.29354	0.092374	-3.17777	0.0026
D (CPI (-1))	-0.65399	0.138326	-4.72791	0.0000
D (CPI (-2))	-0.49289	0.14296	-3.4477	0.0012
D (CPI (-3))	-0.5237	0.141263	-3.70726	0.0005
D (CPI (-4))	-0.3434	0.123647	-2.77721	0.0077
D (CPI (-5))	-0.43079	0.123931	-3.47601	0.0011
D (CPI (-6))	-0.25863	0.124725	-2.07359	0.0434
D (CPI (-7))	-0.28422	0.118564	-2.39717	0.0204
D (CPI (-10))	0.237523	0.100446	2.364689	0.0221
D (KIBOR)	-0.96919	0.206947	-4.68327	0.0000
D (KIBOR (-3))	-0.41535	0.21029	-1.97513	0.0539
D (KIBOR (-8))	-0.67318	0.217527	-3.09468	0.0033
D (KIBOR (-10))	-0.50624	0.194792	-2.59887	0.0123
Coint Eq (-1) *	-0.12321	0.020801	-5.92301	0.0000

Source: Developed by the author.

Table 9  
Diagnostic tests: the serial correlation LM test

F-statistic 0.291297 Prob. F (2,47) 0.7486  
Obs\*R-squared 1.187652 Prob. Chi-Square (2) 0.5522

Source: Developed by the author.

Table 10  
The heteroskedasticity test

F-statistic 0.673371 Prob. F (47,49) 0.9122  
Obs\*R-squared 38.06519 Prob. Chi-Square (47) 0.8205

Source: Developed by the author.

Table 11  
Diagnostic tests: normality test

Mean 8.28e-6 Skewness 0.436528  
Median -0.014149 Kurtosis 3.731487  
Maximum 1.140859 Jarque-Bera 5.243250  
Minimum -0.897990 Probability 0.072685  
S.D. 0.387469

Source: Developed by the author.

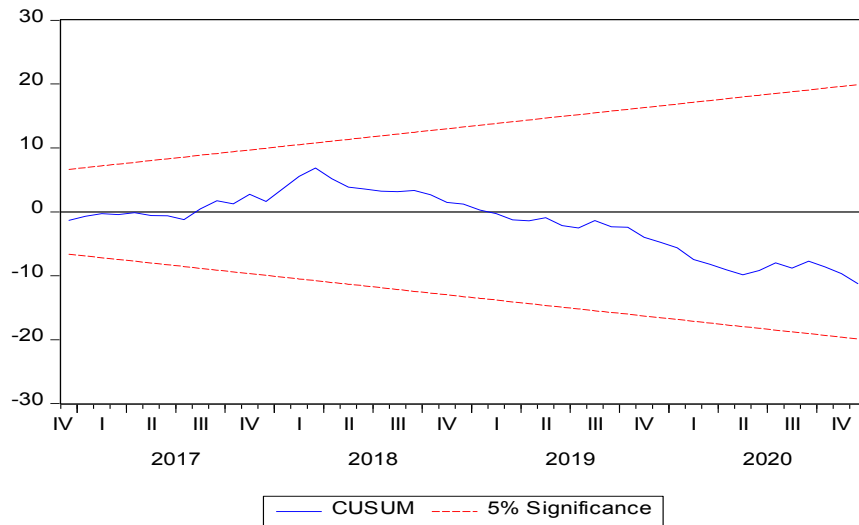


Fig. 6. The CUSUM Test

Source: Developed by the author.

ket. The current government, with an aim to boost economic growth and provide employment, used monetary policy, aka interest rates, to achieve its twofold objective. This objective will also influence house prices. This study analyzes time series data to study the influence of monetary policy on housing prices in Pakistan.

We used monthly time series data from 2011M1 to 2020M12 obtained from different websites, like housing prices data from zameen.

com, KIBOR (Karachi interbank offered rate) from the State bank of Pakistan as a proxy for monetary policy, the exchange rate from the State bank of Pakistan and (CPI) the consumer price index obtained from international monetary funds. Based on the model identification strategy, we used ARDL (Auto Regressive Distributed Lag) method proposed by [26] to examine the drivers of houses prices in Pakistan. Before using the ARDL technique, we



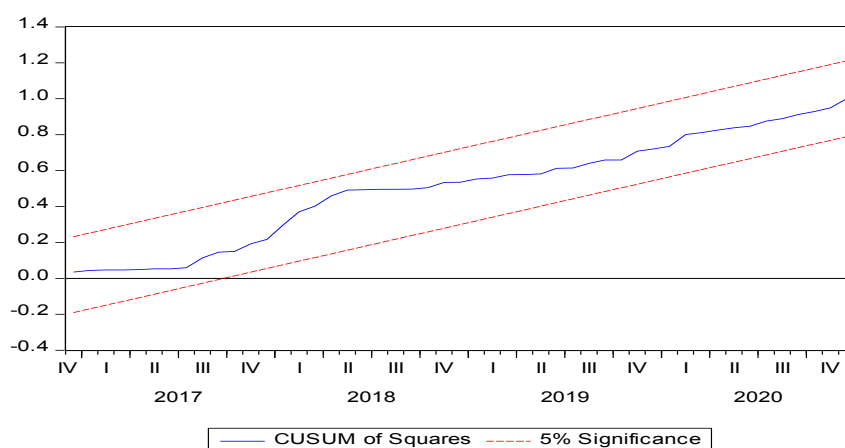


Fig. 7. The CUSUM Squares Test

Source: Developed by the author.

selected a proper lag length, which turned out to be 11 months. Various diagnostic tests indicated model stability with no autocorrelation or structural breaks. After using the ARDL bound test, we found that the F statistic value is greater than upper critical bound (UCB) at one and five percent of significance levels. Our analysis found that the KIBOR rate negatively affected house prices. Meaning that monetary policy is affecting house prices, and contractionary policy rate negatively affects housing prices, but a loose policy rate has a favorable impact. The current study's findings also match those of prior studies, such as [2, 4, 6, 18, 25].

Inflation and exchange rates affected house prices positively.

**Recommendations.** Apart from the authorities' decisions, there were strong expectations for this sector to grow rapidly in the future. The findings of the current study suggest that there should be a well-structured, transparent, and centralized framework, and that the central bank should provide a separate platform where the loans are being used for their intended use in productive investment instead of dead investment (like property investment). This will lead to higher employment and investment as well as a reduction in housing prices.

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# Exploring the Association between Poverty, Livelihoods, Institutions, and Sustainable Community Development. A Conceptual Analysis

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## ABSTRACT

The **aim** of this paper is to assess the links or interfaces between poverty, livelihoods, institutions, and sustainable community development through a literature review. To realize this objective, the study used the Department for International Development's (United Kingdom) Sustainable Livelihoods Approach as an overarching theoretical foundation. A **descriptive method** of data analysis using secondary data and a qualitative research approach were followed. The current state of the problem has been explored by means of a deductive approach. The **results** of the conceptual analysis show that the interactions between poverty, livelihoods, institutions, and community development are significant. The study also revealed that institutions are crucial for the formation of livelihood possibilities and strategies for the poor and marginalized groups, and they play a significant role in sustainable development. Existing empirical evidence demonstrates that livelihood outcomes may be positive or negative based on vulnerability contexts, the nature of livelihood, institutional frameworks, and livelihood strategies followed. The study **concludes** that institutional influence is pivotal since it directly or indirectly affects the access to livelihood, determines livelihood strategies and outcomes. Policymakers are therefore expected to consider and comprehend the relationship between these notions before formulating policies, plans or programs to alleviate poverty and promote sustainable development effectively.

**Keywords:** poverty; livelihoods; institutions; livelihood strategies; community development; sustainable development

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ОРИГИНАЛЬНАЯ СТАТЬЯ

# Исследование взаимосвязи между бедностью, средствами к существованию, институтами и устойчивым развитием сообществ. Концептуальный анализ

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## АННОТАЦИЯ

**Цель** этой статьи — оценить зависимости и взаимосвязи между бедностью, средствами к существованию, общественными институтами и устойчивым развитием сообщества с помощью обзора научной литературы. Для достижения этой цели в качестве теоретической основы исследования выбран подход министерства международного развития Великобритании к обеспечению устойчивых средств к существованию (Sustainable Livelihoods Approach). Результаты представлены с помощью описательного **метода** анализа вторичных данных и качественного исследовательского подхода. Текущее состояние проблемы



было исследовано с использованием дедуктивного подхода. **Результаты** концептуального анализа показывают, что взаимосвязи между бедностью, средствами к существованию, общественными институтами и развитием сообщества являются значительными. Исследование также продемонстрировало, что институциональное влияние играет важную роль в устойчивом развитии при формировании возможностей и стратегий получения средств к существованию для бедных и маргинализированных групп населения. Существующие эмпирические данные свидетельствуют о том, что результаты получения средств к существованию могут быть положительными или отрицательными в зависимости от контекста уязвимости, характера средств к существованию, институциональных подходов и стратегий обеспечения средств к существованию. В исследовании сделан **вывод** о том, что институциональное влияние имеет решающее значение, поскольку оно прямо или косвенно влияет на доступ к средствам к существованию, определяет стратегии и результаты обеспечения средствами к существованию. Авторы полагают, что политические деятели осмысливают взаимосвязь между этими понятиями при разработке планов или программ по сокращению бедности и эффективному содействию устойчивому развитию.

**Ключевые слова:** бедность; средства к существованию; институты; стратегии обеспечения средств к существованию; развитие сообщества; устойчивое развитие

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## 1. Introduction

The conventional measure of poverty, which is income, i.e., a consumption-based indicator, is now diminishing as most scholars have come to understand the multidimensional nature of poverty. Researchers and development policymakers now recognize that poverty is beyond a lack of financial resources but rather includes a wide range of issues other than a lack of income, such as vulnerability context, a lack of livelihood assets, institutional influence, and other dimensions of well-being [1]. In the capability approach, as explained in [2], poverty is viewed as the deprivation of the capability to generate income, rather than as low income. The conventional strategy to reduce poverty has been losing ground to the sustainable livelihood approach recently since it is thought to be too narrowly focused [3]. As a result, an examination of the interconnections between various attributes is required.

In development studies, the concept of “livelihoods” has grown in complexity as a means to conceptualize the entire range of economic activities that impoverished and non-impoverished people engage in [4]. The concept of livelihoods is best explained within the notion of sustainable livelihood, which presents the possibility of a comprehensive and integrated strategy for reducing poverty. The sustainable livelihood approach draws attention to the intrinsic potential of people in terms of their knowledge, social connections, access to materials and money, and

capacity to have an impact on key organizations [5]. On the other hand, community development is an attempt to initiate capacity building for improving the institutional role, resilience power, skills and knowledge, culture, social capital, etc. of the society [6]. Therefore, in order to identify important issues for the interface where an intervention could be strategically important for effective poverty reduction, it is crucial to analyze how poverty, livelihood, institutions, and community development interrelate and influence one another. This will help better understand the complex and diverse processes through which livelihoods are constructed.

This study contributes to depicting the junction between poverty, livelihoods, institutions and community development for policy intervention. Thus, it contributes to the current academic literature by providing evidence regarding the interface. Further, this paper provides evidence for the pivotal role of institutions in guiding livelihood outcomes (whether positive or negative). The rest of the paper is structured as follows. Section 2 deals with methodology, Section 3 provides a literature review, Section 4 presents results and discussion, and Section 5 concludes the paper.

## 2. Methodology

This study adapted the Sustainable Livelihoods Approach (SLA) as the overarching theoretical framework (with a minor modification) that directs the discussion on the relationship or interfaces between poverty, livelihoods, institutions,

and community development. The theoretical and empirical academic literature deemed pertinent to this study underwent a thorough assessment. In order to accomplish its goal, this study reviewed the concepts related to poverty, livelihood, institutions, community growth, tools and techniques. A descriptive analysis and qualitative research approach were followed to depict the interface. The descriptive design is employed to describe how poverty, livelihoods, institutions, and community development affect one another.

### 3. Literature review and conceptual analysis

#### Concepts of Poverty

Despite its universality and the vast amount of literature on it, there is no agreement among experts over the definition and method of measuring poverty [7]. For instance, poverty is a word used in three different ways in literature. The first concept is applied to low-paid workers and people out of work to reflect hardship, misery and destitute conditions. The second refers to incomes, wealth and real living standards of different kinds of people, although this concept still may not measure what poverty is. The third usage raises questions about inequality, exclusion, discrimination, injustice and relative poverty, which call for a new morality [8, 9].

Poverty can be described using multidimensional approaches such as structural or institutional, socio-cultural, political, and economic aspects. According to [10], poverty can also be described as deprivation of political power or empowerment, access to resources (including human and material), socio-cultural wellbeing, as well as the quality of institutional structures. Generally, poverty is the lack or loss of a sustainable livelihood. Different attempts were made to identify methods of measuring poverty. Some of these are income level, level of expenditure, and quantity of caloric intake, termed "absolute poverty measures". Others are the quality of housing, the value of assets, access to physical, financial, social, natural and human capital, etc., which are considered measures of relative poverty [11].

To understand poverty, the concept of a certain society's socio-cultural wellbeing, tangible and intangible resources and assets, as well as institutional and political conditions, is required [5]. Thus, poverty is not only the gaining of low or

insufficient income, but also a multi-dimensional concept. It includes the deprivation of an individual or a group from economic, social, psychological and political capabilities. This may manifest in a lack of entitlements and access to a variety of resources such as human, political, social or natural capital, that enable individuals to satisfy their basic needs [10]. The recent understanding of the concept of poverty helps us understand that well-being is not only about increased income. Food insecurity, social inferiority, exclusion, a lack of physical assets, and vulnerability are other dimensions of poverty that need to be addressed [1]. Factors such as access to assets and the influence of policies and institutions significantly determine household poverty [12].

As explained by A. Sen [2], households or individuals are said to be poor when they fall into deprivation of political power, access to livelihood assets (including human and material), and socio-cultural wellbeing. The value of goods and services that are purchased, self-produced or gifted can be expressed in terms of monetary value, which is an income-based measurement of poverty. However, poverty-line analysis ignored the dynamics of poverty and failed to distinguish between temporary and persistent poverty [13]. Reducing the number of poor is a common global concern of governments, international agencies and civil society. Though effective ways to pursue the achievement of this objective are debatable, current policies tend to focus on enabling institutional environments rather than direct initiatives to reduce poverty [14].

Due to the multifaceted character of poverty, a comprehensive interdependent strategy that addresses both the symptoms and structural causes of poverty is required [7]. There is a need to research additional aspects, such as the influence of institutional structures, that have both positive and negative effects on the outcomes of livelihood. It is necessary to determine how institutions influence the livelihoods of the poor in order to comprehend their situation. The participation of the local community in the process of examining their fate also contributes to our understanding of the means of subsistence for the impoverished. A detailed view of the relationship between livelihoods, poverty, and institutional influences, as well as the outcomes of livelihoods that impact people's lives, is best explained by the Sustainable Livelihoods Framework [6].

## Livelihood concepts

As discussed in [13], livelihood concepts are best described within a sustainable livelihood framework that was developed based on the recognition that “households construct their livelihoods both on the basis of the assets which are available to them and within a broader socio-economic and physical context underlined in recent attempts to devise a graphic model of the factors that need to be taken into account in analysis and policy”.

Different people may define livelihood referring simply to making a living, supporting a family, having job security, etc. However, the term livelihood is as complex as human struggle for survival. With the assistance of government, civil society, and external organizations, the hidden complexity behind the term got simplified as attempts were made to help people whose means of making a living were endangered. Through various learning and experiences, different definitions were given for the term. As cited in [4, 5], Robert Chambers and Gordon Conway [15] for the first time proposed the following broad definition of a sustainable rural livelihood, which different developmental agencies adopted in framing the sustainable livelihood approach. The definition is as follows:

*A livelihood comprises the capabilities, assets (stores, resources, claims and access) and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stress and shocks, maintain or enhance its capabilities and assets, and provide sustainable livelihood opportunities for the next generation; and which contributes net benefits to other livelihoods at the local and global levels and in the short and long term.*

Although this definition can be applied to different hierarchical levels, the authors stressed that it is most commonly used at the household level. The Institute for Development Studies (IDS)<sup>1</sup> at the University of Sussex, Brighton, UK, first proposed a somewhat modified and more realistic definition of a sustainable livelihood:

*A livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks, maintain or enhance its*

*capabilities and assets, while not undermining the natural resource base.*

## Sustainable Livelihood Approach

The perception of sustainable livelihood was expanded when the United Nations Conference on Environment and Development, held in 1992, advocated the achievement of sustainable livelihoods as a broad goal for poverty eradication. It underlined that sustainable livelihoods could function as an integrating factor that allows policies to address development, sustainable resource management, and poverty eradication at the same time, mostly for rural development.

As illustrated by Krantz [5], the concept of sustainable livelihood, derived from the general definition of livelihood by Chambers and Conway [15], was given a minor modification by IDS:

*A livelihood is sustainable when it can cope with and recover from stresses and shocks, maintain or enhance its capabilities and assets, while not undermining the natural resource base.*

To become a recognized principle in development collaboration, this definition also requires a context-related interpretation of sustainability that acknowledges the role of time, space, and culture, since the concept of sustainability of livelihood goes beyond the conventional definitions and approaches to poverty eradication. This manifests that the livelihood is dynamic. The dynamism of livelihood depends on environmental, social, economic, political stresses, technological advancement, etc. Thus, the sustainable livelihood approach aims at promoting development that is suitable for not only ecological but also for perfect positive outcomes through social, economic and institutional engagements [12]. However, the livelihood strategies adopted by rural households may vary greatly based on initial livelihood capital, leading to different outcomes in terms of income growth and poverty alleviation [16].

Theoretical frameworks developed by different agencies in order to better understand how people develop and maintain livelihoods vary. As mentioned above, this paper focuses on the commonly accepted and widely used DFID<sup>2</sup> model

<sup>1</sup> URL: <https://www.ids.ac.uk/>

<sup>2</sup> Department for International Development (DFID). Sustainable Livelihoods Guidance Sheets. London, UK, 1999. URL: <https://www.livelihoodscentre.org/documents/114097690/114438878/Sustainable+livelihoods+guidance+sheets.pdf/594e5ea6-99a9-2a4e-f288-cbb4ae4bea8b?t=1569512091877> (accessed on 02.06.2023).



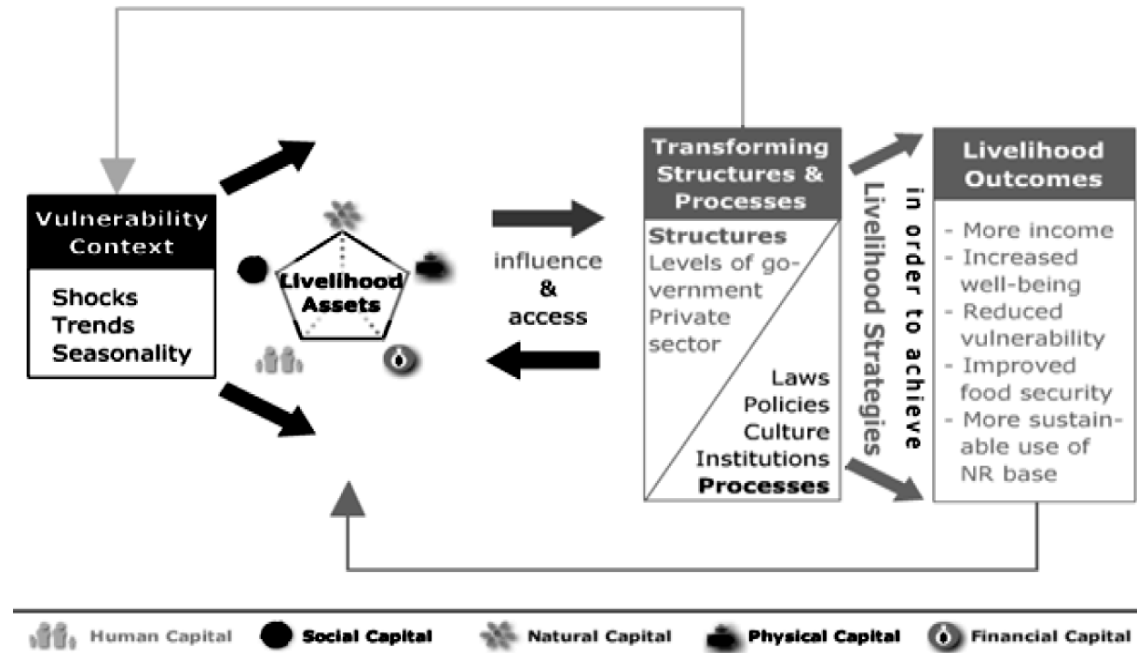


Fig. 1. Sustainable Livelihood Framework

Source: Adopted from DFID Human capital – skills, knowledge, health and ability to work.

(Department for International Development, UK), which adapts a version of Chamber & Conway’s definition of livelihoods. The framework is more holistic in its approach and conceptualizes: vulnerability context, livelihood assets, a range of institutions and processes, a choice of livelihood strategies, and livelihood outcomes.

Although the framework does not intend to be a perfect model of reality, it provides a systematic arrangement to facilitate a broad and logical understanding of the different factors that constrain or enhance livelihood opportunities, and to show how they relate to each other. However, it may not clearly define what exactly constitutes poverty specifically and still needs further investigation [5].

For better applicability, different development agencies like the United Nations Development Program (UNDP), the international non-governmental organization (CARE), and the British Department for International Development (DFID) used the concept of sustainable development with certain simplifications. Out of these, the DFID’s concept of sustainable livelihoods is the most commonly acknowledged because of its goal of eradicating poverty in poorer nations, which received recognition after the publication of the UK Government White Paper on International Development in 1997. The IDS working paper published in June 1998 also provided an analytical framework for sustainable rural livelihoods [17].

Thus, the DFID’s definition of sustainable livelihood is in line with the one developed by IDS and is a revised version of the original definition structured by Chambers and Conway [15]:

*A livelihood comprises the capabilities, assets (including both material and social resources), and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base.*

For the convenience of this study, the paper uses DFID’s core concepts of sustainable livelihood approach to systematically understand the nexus between poverty, livelihoods, institutions and community development. Accordingly, the core principles of DFID’s sustainable livelihood approach include people-centered (responsive and participatory), holistic (multi-level), partnership, sustainability, and dynamic approaches [4]. The following framework (Fig. 1) shows the DFID’s sustainable livelihood framework, which was derived in line with the IDS’s framework.

The illustration shows the interconnecting network system of livelihoods, poverty, institutions, and community development. The framework embraces vulnerability conditions and trends, livelihood resources, process and organizational structures, livelihood strategies and outcomes as described below based on [4, 5].



**The vulnerability context** refers to shocks, seasonal changes and trends. Shocks include natural disasters, wars, and economic downturns. Seasonal changes may affect the availability of resources, income-generating opportunities, and demand for certain products and services. Trends include the nature of politics and governance, technological advancement, and the availability of natural resources.

**Livelihood assets** include both tangible (land, cash savings, live stocks, tools, food stores) and intangible assets (claims and access). Livelihood assets or capitals can be categorized into five groups:

- Human capital — skills, knowledge, health and ability to work.
- Social capital — social resources, including informal networks, membership of formalized groups and relationships of trust that facilitate co-operation and economic opportunities.
- Natural capital — natural resources such as land, soil, water, forests, etc.
- Physical capital — basic infrastructure, such as roads, water and sanitation, schools, information and communication technology (ICT), producer goods, etc.
- Financial capital — financial resources including savings, credit, and income from employment, trade and remittances.

**Institutions and organizations** are social linkages that bring stakeholders together to access assets of different kinds, providing a means of exercising power and the gateways to positive or negative livelihood outcomes. Thus, institutions mediate access to livelihood assets and, in turn, influence the content of a range of livelihood strategies. Institutions determine the encouragement of individuals to invest in and get the skills that lead to success and better well-being in the long run [18]. Therefore, understanding institutions and institutional processes is the input to designing interventions that advance sustainable livelihood outputs.

**Livelihood strategies** refer to the way in which people access and use the assets explained above, within certain social, economic, political and environmental contexts. This considers capital and labor inputs, active choice to invest in diversification, voluntary and involuntary movement of people that may result in re-investment, respectively. Livelihood strategies are a collection of

activities that people do to ensure their survival and meet their basic needs [19]. Rural residents pursue diversified activities (farm, off-farm, non-farm and combination of all three) in their daily struggle to make a living [20]).

**Livelihood outcomes** refer to the results of all processes within the framework. They include increased income (e.g., cash), improved well-being (e.g., non-material goods, such as self-esteem, health status, access to services, and a sense of inclusion), decreased vulnerability (e.g., better resilience through increased asset status), improved food security (e.g., increased financial capital to purchase food), and a more sustainable use of natural resources (e.g., appropriate property rights).

### **Concepts of institution**

D. C. North [21] describes institutions as the “rules of the game” in a society. Institutions embody power and form guides and stable structures for whatever the daily life of human interactions involves by reducing uncertainty. Accordingly, institutions comprise manmade formal and informal constraints that shape human interactions. Formal constraints include constitutions, laws, and regulations governing politics and economics, while informal constraints include conventions, customs, codes of behavior, and conduct. Both formal and informal restrictions determine the encouragement of human exchange in political, social, and economic situations. Institutional (organizational) efficiency depends on the capacity of enforcement to punish for deviating from rules [18].

In most of the social science literature, the distinction between institution and policy is not clearly underlined. Conceptually, the two words are used interchangeably. However, they do not necessarily refer to the same meaning. Institutions are comprehensive and serve a collective purpose of complex norms, rules, customs and behaviors. On the other hand, policies function based on structured activities of an organization. Thus, many institutions are organizations, but many organizations are not institutions. Institutions comprise any form of constraint that human beings devise to shape the human interface. Institutions created or evolved over time, like the constitution and common law. Institutional frameworks influence the way organizations come

into existence and how they evolve to achieve the common objectives of institutional dimensions: economic, social, and political aspects of human life [22].

### Community development concepts

By its definition, community development came across having different concepts. For instance, from the 1950s up to the early 1970s, community development approach focused on poverty alleviation at the community level largely on top-down decision-making process within the context of existing social and economic structures [23]. However, this approach has shortcomings as it acts on behalf of the poor rather than giving a chance to local people to participate equally in decision-making. Thus, it was top-down and bureaucratic, with goals at the national level. In recent times, however, the concept of community development has been understood as a bottom-up approach directly linked to determining interventions based on the decisions and priorities of local people themselves rather than by outsiders [6]. Thus, by definition, community development involves work at the grass-roots level, not focusing on the policy level only, unlike the sustainable livelihood approach.

Community development involves empowering a community by initiating capacity building in improving institutional role, resilience power, skills and knowledge, culture, social capital, etc. Community development was assumed as economic development in earlier times. In fact, economic development at the local level has been an approach for development strategies. This approach recognizes the need for the interconnecting assets, institutions, and strategies to achieve the expected outcomes [6].

### Theoretical and conceptual frameworks

As mentioned in the previous section, the sustainable livelihood approach is the underpinning theoretical framework for this review. The Sustainable Livelihood Approach (SLA) is essentially a method for understanding the livelihoods of those who are poor holistically to create strategies for effective poverty intervention. Therefore, in order to fully comprehend the connections between livelihood access, assets, context, and institutions, as well as their consequences on individual, household, or commu-

nity asset accumulation, a livelihoods approach to poverty and livelihood analysis is necessary [16]. The following picture (*Fig. 2*) shows a summarized conceptual framework for the review.

## 4. Results and discussion

A deep analysis of the literature shows that understanding the linkages between poverty, livelihoods, institutions, and community development requires conceptualizing the notions of vulnerability context, livelihood assets, institutions, livelihood strategies, and livelihood outcomes [6]. Individual or group ability to access and use assets is influenced by institutions, processes and policies, either with a positive or negative outcome. Livelihoods are formed within political, economic and social contexts [5]. As these contexts are interdependent, they create new livelihood opportunities or obstacles that determining one's poverty status. Thus, there is a remarkable linkage between institutions and community development. As presented in the framework (*Fig. 2*), livelihood strategies and outcomes not only depend on access to livelihood assets or are inhibited by the vulnerability context; but they are also transformed by the conditions of structures and processes, i.e., institutional influence.

Institutions exert profound influences on livelihoods, because they help in the implementation of policies and strategies, laws and regulations, functioning social networks, coordinated utilization of resources, promoting accountability, etc. [22]. In the absence of effective institutions and processes, policies may not function to bring about the desired outcome [23]. On the contrary, institutions may otherwise hinder livelihood sustainability and poverty reduction if poorly framed. The fate of a given society to be poor or rich can be determined by its institutional constraints and whether it responds to political and socio-economic activities that encourage productivity or not [24]. When we see that some organizations, such as political parties, trade unions, business associations, etc., are unproductive, it is important to see if the institutional frameworks in which they operate provide them with an incentive to be unproductive. In the case of developing countries, the institutional framework may not support activities that promote productive activity but may favor redistributive behavior. This may create

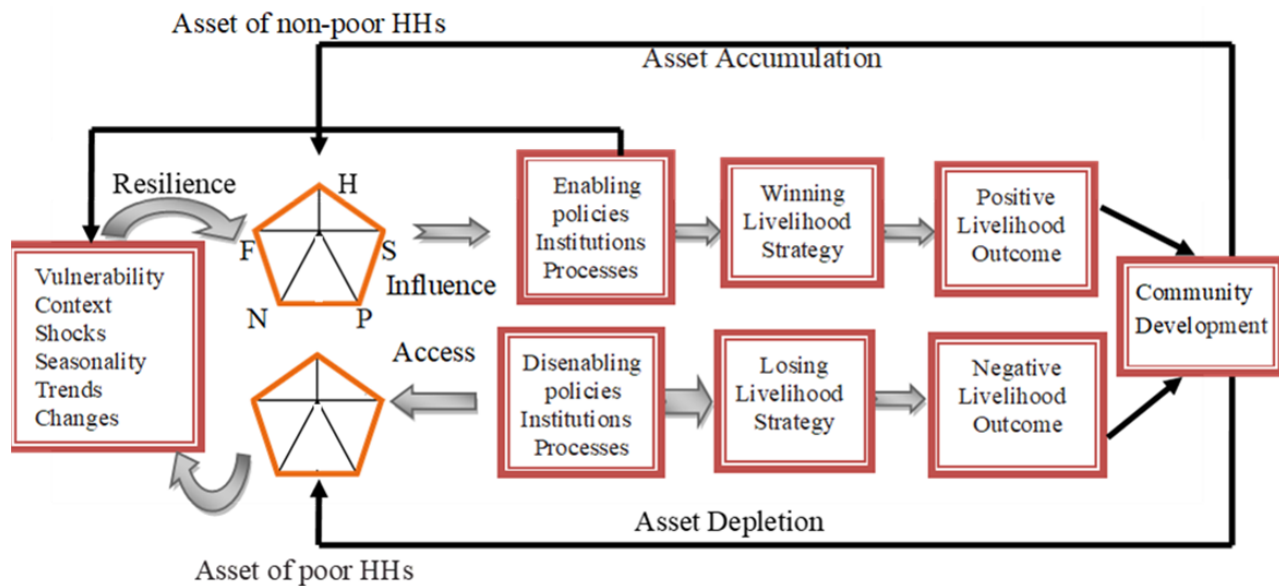


Fig. 2. Conceptual framework of the study

Note: H – Human Capital; N – Natural Capital; F – Financial Capital; S – Social Capital; P – Physical Capital; HHs – Households.

Source: Adapted from [6].

monopolies rather than competitive conditions. With this, institutions may affect the process of wealth formation as well as converting that capital into output. It is true that resilience is not always necessarily positive. Damage to livelihoods is one of the situations in which transformation may become questionable [4].

Among the aspects of sustainable community development, the central point is people. How to plan for community development depends on poverty levels, people's capabilities and local knowledge, and other livelihood assets, institutional models, strategies adopted, etc. [25]. Community development procedures tend to use realistic and attainable participatory projects, which a group of community members carry out themselves through a series of successive learning experiences based on vulnerability contexts, availability of resources, nature of institutions and strategies to achieve the desired outcomes. Such a process can be seen as resilience-building strategies and calls for the integration of livelihood strategies that, in turn, form cohesion when positive outcomes are achieved [26].

A.S. Carloni discussed sustainable livelihood frameworks [6], illustrating both positive and negative outcomes depending on influences and access, institutional nature and livelihood strategies. Accordingly, because of enabling policies, institutions and processes, there would be a strong

livelihood base, which broadens livelihood options and reduces vulnerability. This justifies the application of sound and winning livelihood strategies. Institutions, therefore, play a decisive role, as shown in Fig. 2, enabling policies, institutions and processes to result in resilient livelihoods and create non-poor households and communities. The positive outcomes of sustainable livelihood strategies help the community gain access to assets for making a living.

The livelihood outcome can be positive or negative, as seen from the framework (Fig. 2). Thus, attempts for local community development may fall into either of the two categories based on vulnerability context, assets, the nature of institutional frameworks to form winning or losing strategies to transform the community's livelihood. As posited by O. Serrat [27], one of the key issues that the poor and vulnerable face is that their livelihoods may be systematically restricted or deprived unless the government supports pro-poor policies that, in turn, influence legislation and even less formal processes. Because of disabling policies, institutions and processes, there would be a much more limited livelihood base, which limits livelihood options and enhances vulnerability, as indicated by the framework (see Fig. 2). Due to the inconvenient nature of institutional frameworks, a lack of assets to fall back on in an emergency allows shocks

to occur. In turn, shocks contribute to negative outcomes for livelihood and poverty [6].

### Conclusion

This study depicts the interface between poverty, livelihoods, institutions and community development. Based on the sustainable livelihood approach, the study scrutinized the relationship between them and found significant linkages. Although it might be possible to identify the interface using the DFID's sustainable livelihood framework, it is obviously difficult to understand what constitutes the real cause of poverty that needs further investigation. Above all, however, the institutional role is more influential because institutions fully mediate the function to access

livelihood assets and draw strategies to attain the livelihood outcomes. Institutions decide the fate of livelihood outcomes through the analysis of their influence on access to livelihood assets. They directly affect livelihood strategies by determining which activity is right or wrong and determine the livelihood outcomes as an indicator of community development. In general, the interface between livelihood, poverty, institutions, and community development shows the total combination of activities pursued by a given individual or group to make a living. As clearly shown in the theoretical framework of this study, well-managed livelihood strategies result in sustainable community development. In contrast, the ill-managed ones result in poverty.

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# Cross-Border E-Commerce as a Way of Alleviating and Reducing Poverty: The Case of China

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## ABSTRACT

This study **aims** to examine the impact of cross-border e-commerce on rural income in China. Economic reforms in China since 1978 have led to the emancipation of approximately 700 million individuals from poverty. Recent rural economic growth in China has been significantly influenced by the widespread adoption of e-commerce, which is being hailed as a potent tool for reducing poverty in rural regions. Through enhanced access to government services, banking facilities, healthcare, and other vital amenities, as well as the provision of global market opportunities for goods and services, e-commerce exhibits the potential to have a profound impact on poverty alleviation. The study leverages **data** from village-level surveys conducted in rural areas. The analysis is conducted using the Structural Equation Modeling (SEM) model. The **findings** indicate that cross-border e-commerce plays a pivotal role in boosting rural income levels, enabling local communities to participate in international trade, and expanding their market presence. The **conclusions** underscore the significance of e-commerce as a driving force in poverty alleviation initiatives in rural China.

**Keywords:** e-commerce; cross-border; poverty alleviation; structural equation modeling; SEM model; China

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ОРИГИНАЛЬНАЯ СТАТЬЯ

# Трансграничная электронная торговля как способ смягчения и сокращения бедности на примере Китая

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## АННОТАЦИЯ

**Цель** данного исследования — изучить влияние трансграничной электронной торговли на доходы сельского населения в Китае. Экономические реформы, проводимые в Китае с 1978 г., привели к освобождению от нищеты около 700 млн человек. На экономический рост сельских районов Китая в последнее время существенное влияние оказало широкое распространение электронной коммерции, которую называют мощным инструментом снижения уровня бедности в сельских регионах. Благодаря расширению доступа к государственным службам, банковским учреждениям, здравоохранению и другим жизненно важным услугам, а также предоставлению возможностей для сбыта товаров и услуг на мировом рынке, электронная коммерция способна оказать существенное влияние на борьбу с бедностью. В исследовании использованы **данные** опросов на уровне деревень, проведенных в сельской местности. Анализ выполнен с использованием **модели** структурных уравнений (SEM). Полученные **результаты** свидетельствуют о том, что трансграничная электронная коммерция играет ключевую роль в повышении уровня доходов сельского населения, позволяя местным жителям участвовать в международной торговле и расширяя их

присутствие на рынке. **Выводы** авторов подчеркивают значение электронной коммерции как движущей силы инициатив по борьбе с бедностью в сельских районах Китая.

**Ключевые слова:** электронная коммерция; трансграничная торговля; борьба с бедностью; моделирование структурных уравнений; SEM-модель; Китай

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## Introduction

China's economic reforms of 1978 have accelerated the nation's economic growth to the point where, by 2018, the gross domestic product (GDP) per person in China had expanded by 168 times, from 384 RMB<sup>1</sup> in 1979 RMB to 65,644 RMB, according to the Bureau of National Statistics. During this time, the Chinese main economy grew at the fastest rate in the world [1–3]. However, it has now become apparent that this growth was unevenly distributed across the years. The nation's Gini coefficient<sup>2</sup> grew from 0.30 in 1979 to 0.40 in 1995, to 0.50 in 2005, and to 0.55 in 2012 [2, 3].

People's lives have been markedly improved by ongoing economic development and social welfare initiatives. Poverty reduction has been significantly aided by social welfare policies [4, 5]. For instance, [2] discovered that the social assistance system had lowered poverty levels by 30% using the China Health and Nutrition Surveys in 1989 and 2009 [2]. According to the criteria for eradicating poverty, which is 2300 yuan per person, 700 million individuals have escaped poverty [5, 6].

Despite the aforementioned measures, according to the 2011–2020 China Rural Poverty Alleviation and Development Outline, which was published in 2011, 17.2% of the rural population, or 166 million people, were still living in poverty in 2010 [6]. However, by the end of 2016, this figure had decreased to 43 million, or 4.5% [4]. The literature claims that impediments to China's poverty alleviation system include a lack of targeted initiatives, bad administration, inadequate money, and a dearth of research and assessment [3].

E-commerce penetration in the rural economy has increased recently due to the advancement of information technology and the rising usage of smartphones in rural regions. Cross-border e-commerce is a straightforward method of earning more from information technology. It adjusts to the needs of upgrading and transforming rural industries. In doing so, it offers fresh impetus for the revival of rural industries. Cross-border e-commerce players' "empowerment" in recent years has also received significant attention [7, 8]. In the literature, cross-border e-commerce was viewed as an effective instrument to help people build modern commerce and agriculture.

E-commerce, in particular, facilitated the growth of the value chain in agriculture and the circulation of commodities [3–6]. E-commerce allows its workforce to work from home, in contrast to traditional commerce, which requires employees to be present at the workplace. For individuals confined to rural regions owing to either agricultural production or care obligations, it is a very accessible type of off-farm labor. E-commerce has emerged as a possible source of economic development for farmers in some rural areas. E-commerce-based poverty alleviation has emerged as a novel approach to the problem.

A number of studies have shown that cross-border e-commerce has successfully established online commodity exchanges and increased incomes for rural families [5–8].

China's experience shows that cross-border e-commerce is boosting farmers' incomes. In 2018, despite the county's high poverty rate, online retail sales were 69.79 billion yuan, up 36.4% year-on-year. The advancement rate was 12.5% higher than the internal online retail upgrade rate and 7% higher than the overall online local retail growth rate.

In 2018, cross-border e-commerce employed more than 28 million people and assisted approximately three million "filed-on-card" low-income households [9].

<sup>1</sup> RMB — the Renminbi is the official name of China's currency. The principal unit of RMB is called the Chinese Yuan (CNY). URL: [www.Investopedia.com](http://www.Investopedia.com)

<sup>2</sup> The Gini coefficient is an index for the degree of inequality in the distribution of income or wealth.

In this study, the term “cross-border e-commerce” specifically refers to international trade conducted through online platforms and transactions between rural areas in China and other countries. It involves the exchange of goods and services across national borders, utilizing information technology and e-commerce platforms to facilitate economic activities. The focus of this research is on examining whether cross-border e-commerce, which encompasses international trade activities, contributes significantly to raising the income of low-income rural families and helps alleviate poverty in the region.

In rural locations, especially in impoverished villages, access to information can raise revenue [5, 8]. Theoretically, cross-border e-commerce might help reduce poverty by bringing in new sources of revenue.

### **Literature review**

#### **E-commerce in China**

Three High (high additional value, high technical content, and high human capital content) and Three New (new commercial activities, new techniques, and new approaches) are characteristics of e-commerce, with the benefits of resource intensivism, ongoing transactions, decreased costs, and market globalization [6].

It is clear from the characteristics of the globalization of the e-commerce market that cross-border e-commerce, specifically transactions subject to several customs frontiers, will become a crucial part of global trade. Statistics show that between 2008 and 2016, China’s share of cross-border e-commerce accounting for the volume of imports and exports climbed from 5% to 20%, with a trend toward sustainable growth [6, 7].

In addition to favorable conditions for the growth of cross-border e-commerce, such as a mature e-commerce and service platform, a gradual increase in related talent, and more national policy support, there are also unfavorable conditions, such as an inadequate logistics system, a high frequency of low-value products, and a miscellaneous category. Threats include the RMB appreciation, increased transaction friction, and high transaction risk [7].

The secret to ending poverty is raising knowledge of progress and inspiring inner drive through informational poverty alleviation among

farmers [10]. E-commerce offers a new way to conduct targeted poverty alleviation that can influence how poor people behave in the market, boost their chances of starting their own business, and completely employ them, boost the chance for poverty-stricken individuals to start businesses and find jobs, and fully realize the potential for rural development [6].

According to [8], cross-border e-commerce has three levels that can be used to reduce poverty: boosting revenue, cutting costs, and empowering farmers. Through three indirect channels — the local business environment, local industries, and the e-commerce environment — the topic of poverty alleviation influences the target of poverty alleviation. The two channels of information and logistics, the three services of industrial, talent, and enterprise, and the three guarantees of planning, organizational, and assessment are all required for poverty alleviation activity.

In 1984, the International Telecommunication Union proposed that by building telecommunication infrastructure, poverty might be eradicated. Information and communication technology was utilized to promote poverty alleviation ideas at the 2003 international conference on “information and communication technology and poverty reduction”.

The Millennium Declaration’s development goal was confirmed at the two World Information Society Summit conferences (in 2003 and 2005), which also emphasized the importance of “unwaveringly endowing the ability to the poor, especially the poor living in remote and border areas, rural areas, and periphery urban areas, and use information and communication technology (ICT) to obtain information, in order to reduce poverty.” According to [4], the use of information and communication technology has high impacts on employment possibilities, poverty alleviation, and education. E-commerce poverty alleviation can enhance conditions for community information acquisition, gender equality, employment opportunities, and health, education, and human capital.

According to [11], inadequate market access, a lack of human capital, and a lack of government backing are the main reasons why ICT and e-commerce are difficult to implement as a practical framework for improving rural artisans’ livelihoods. According to their analysis



of 292 middle- and small-sized businesses in Indonesia, [12] found that businesses with a high acceptance of e-commerce earned more money. The primary functions of these businesses were marketing and procurement. They use e-commerce as their primary measure of income in order to expand market boundaries, raise sales volume, enhance external communication, promote company image, speed up manufacturing, and increase labor force productivity.

In a 2016 study, C. Leong and S.L. Pan examined how institutional supporters, grassroots leaders, e-retailers, e-supply chain partners, and third-party e-commerce service providers use ICT to create, expand, and update e-commerce in the two villages of Suichang and Jinyun. It is possible to draw the conclusion that the rise of e-commerce was likely to lead to peasant migration for employment or self-employment, degradation of rural environments, and fierce rivalry.

There is a lack of empirical analysis based on e-commerce enterprises, so this paper focuses on the role and impact of cross-border electronic commerce as a way of reducing or eliminating poverty. Recent e-commerce poverty alleviation research has mostly focused on the current situation, the development advantages of e-commerce, and the challenges.

### **Poverty reduction in China**

China has significantly advanced in achieving its objectives for eradicating poverty during the past 40 years. Most rural households have made slow but steady progress out of complete poverty.

Rural poverty has decreased by 739.9 million individuals under the existing poverty line [13]. China has made substantial advancements toward inclusive and sustainable growth that reduces poverty, according to the World Bank. Below is a detailed analysis of China's outstanding contributions to the fight against poverty.

China's poor population peaked in 1978 at roughly 250 million people. Low rural production was the primary cause of widespread poverty. Rural productivity has significantly increased as a result of the reformulation of the fundamental local systems of management and the commodity system of circulation in pastoral areas. Both agricultural output and farmer income have

grown rapidly. As a result, the number of rural poor people has significantly dropped. The old, small, border, and poor areas are typically where the remaining people with low income live, as shown in *Fig. 1–3*.

Without significant economic growth, it is challenging for the impoverished residents in those areas to effectively escape poverty. Since 1986, the Chinese government has launched numerous large-scale initiatives to reduce rural poverty. These initiatives formed 331 significant national aid-the-poor counties and developed a "county-level targeting" framework. Following [14], the Chinese economy began a new phase of rapid expansion. During this stage of economic development, economic expansion became the primary driver behind the reduction of poverty. However, unbalanced regional development was necessarily spurred by rapid economic growth, and the underprivileged population continued to congregate there.

To address these issues, China launched its Alleviating Poverty Program (1994–2000) in 1994, making the supply of food and clothes to the poor a priority. China now has 32 million (relatively few) people living in extreme poverty than it had seven years after the project's launch. Despite these outstanding successes, a new problem has arisen: a significant portion of the surviving poor is concentrated in rural regions, which were unaffected by the earlier counterpoverty initiatives.

The government responded to the new issue by releasing the Chinese Rural Reduce Poverty and Development Project (2001–2010), which lifted the constraints on the use of the poverty elimination fund and expanded coverage to impoverished individuals not residing in the official poverty boundary counties.

The Plan for Development-Oriented Poverty Alleviation for China's Rural Areas (2011–2020) was released by the government in 2011. The southern Xinjiang region, Tibet, the Tibetan region in four provinces, and the Outline for Development-Oriented Poverty Alleviation for China's Rural Areas were chosen as the three important areas for combating poverty.

The national information network for reducing poverty has a system for unified administration that the government started using in 2014 to identify the poorest communities.

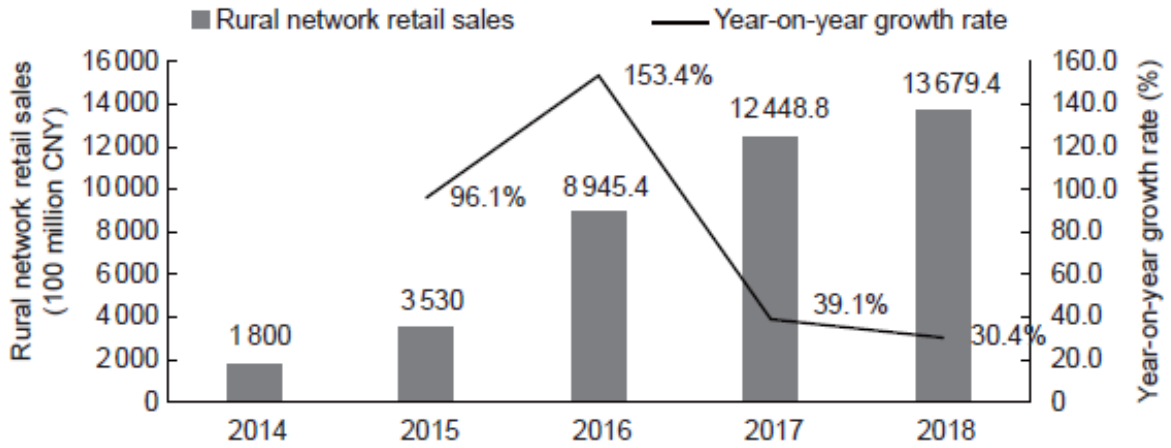


Fig. 1. National rural online retail sales, 2014–2018

Source: Chinese Ministry of Commerce, 2019.

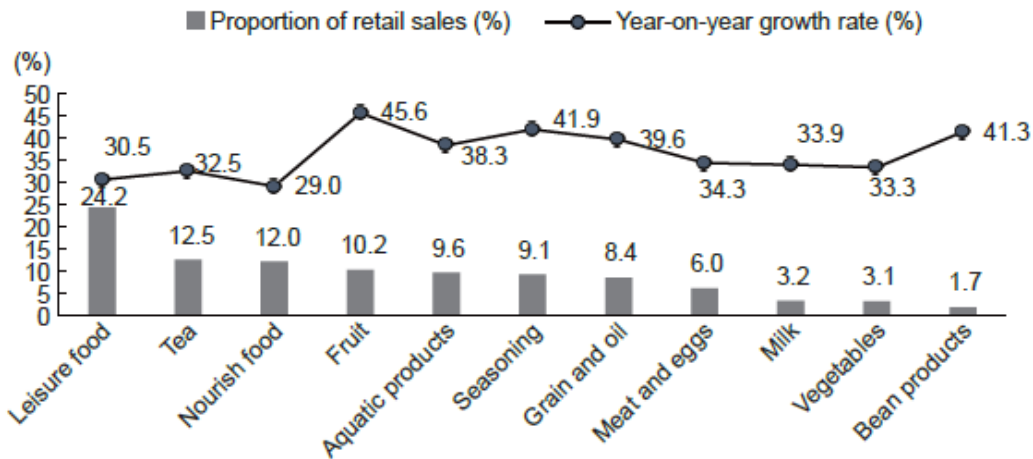


Fig. 2. 2018 retail sales percentage for agricultural items and yearly growth rate

Source: Chinese Ministry of Commerce, 2019.

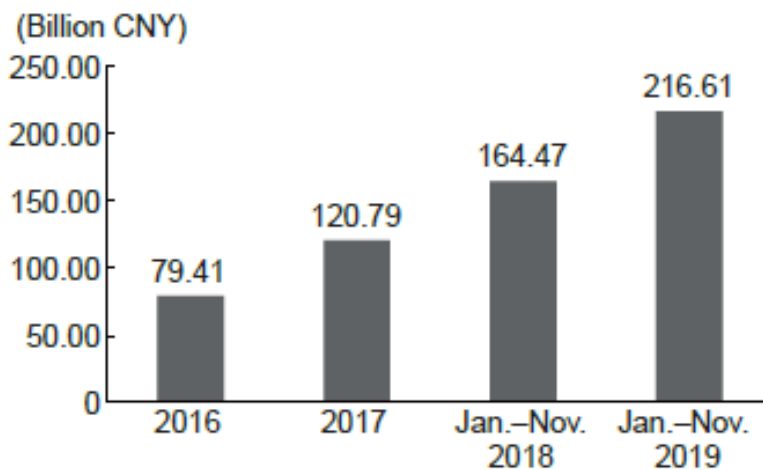


Fig. 3. Nationwide online sales from counties with extreme poverty

Source: Chinese Ministry of Commerce, 2019.

Table 1  
E-commerce in rural areas from 2014 to 2019

Year	Number of demonstration counties	Number of national poverty-stricken counties	Proportion of national poverty-stricken counties (%)
2014	56	14	25.00
2015	200	90	45.00
2016	240	158	65.83
2017	260	237	91.15
2018	260	238	91.54
2019	215	138	64.19

Source: China Electronic Commerce Report (2014–2019), Ministry of Commerce of China. URL: <http://www.mofcom.gov.cn/index.shtml>

According to the 2010 poverty standard, 16.6 million more individuals lived in rural poverty in 2018 than in 1985 (661.0 million), while the prevalence of poverty decreased from 78.3% to 1.6%.

By the end of 2020, China should have completely eradicated extreme poverty.

E-commerce might now alleviate poverty in three key ways. For the purpose of eradicating poverty through e-commerce, which has grown quickly in urban areas and expanded to rural regions in certain impoverished zones, infrastructure and business models are ready.

The agricultural products from the targeted areas of severe poverty can be standardized by e-commerce platforms, which can subsequently convert them into in-demand purchases. This contributes to the resolution of poverty issues that are concentrated in particular locations.

The idea of development-oriented poverty reduction is the foundation of the new approach to fighting poverty, which aims to switch from “blood transfusion” to “hematopoiesis.”

Thus, e-commerce is viewed as a modern sector that may foster human capital and stimulate hematopoiesis.

### **E-commerce as a toolset to fight poverty**

Cross-border e-commerce has been encouraged by the Chinese government as a key tool for reducing poverty. Cross-border e-commerce has recently pushed the rural industrial value

chain forward. The best route for the distribution of rural goods is e-commerce. As was mentioned, cross-border e-commerce gives residents in those areas access to new career opportunities. Poor counties are the main geographic areas supported by e-commerce poverty alleviation, according to numerous policy documents. Since the National Rural E-commerce Comprehensive Demonstration Project (NRECDP) was jointly launched by the Ministries of Finance and Commerce in 2014, 875 counties in impoverished states are NRECDP member counties. The NRECDP will be implemented in all state-level impoverished counties by 2019.

The NRECDP initially focused on selling agricultural goods. The potential role of online shopping in eradicating poverty was not mentioned expressly. However, the project’s pilot stage resulted in the development of a local e-commerce infrastructure and enhancement of service. A number of cross-border e-commerce executives received training in the NRECDP regions. Legislation governing the NRECDP was established in 2016 by the State Council Leading Group Directorate of Development and Poverty Alleviation, the Ministers of Finance and Commerce, as well as other ministries. According to this rule, at least 50 percent of the areas that are registered must be those that fall under the category of being nationally destitute.

The integrated e-commerce demonstration project in rural regions from 2014 to 2019 is shown in *Table 1*. Since 2017, financing for cross-border e-commerce has steadily increased.

A particular demand by governments at the local level that are being asked to “promote the rise of cross-border e-commerce”. That was written in 2017’s No. 1 Central Document, which prompted the creation of e-commerce business parks in nearby towns.

The goal of the program is to increase rural families’ power to create e-commerce, according to papers published in 2018 by the Ministry of Finance, the State Council’s Poverty Alleviation Office, and the Ministries of Commerce and Finance. Transferring funds from the central government will benefit all areas, especially those that are very impoverished. Increasing the marketing channels for rural goods and enticing more rural inhabitants to engage in cross-border e-commerce are two more targeted initiatives that assist impoverished communities in using the potential of their resource endowment. For communities extremely stricken by poverty, e-commerce service coverage level must achieve more than 50% as one of NRECDP’s quantifiable goals. To do this, general administrative villages are also necessary. The Ministry of Finance would provide 20 million CNY to each county participating in the NRECDP. The transfer payment should go toward particular initiatives that advance rural e-commerce, such as upgrading the local public utility system, expanding rural product marketing, and training the workforce participating in international e-commerce.

The NRECDP promotes the production, grading, packaging, and advertising of rural products to move them into metropolitan areas. NRECDP advertises public service facilities and online stores. By concentrating on logistics, training, and measures for combating poverty in rural regions, the clustering effect may be realized. With assistance from the NRECDP, farmers would receive training in order to engage in e-commerce.

The following are some ways in which e-commerce helps to reduce poverty, according to a text analysis of official documents. First, e-commerce is a powerful instrument in the fight against poverty. Rural products can be produced and sold in underdeveloped regions by overcom-

ing spatial barriers that prevent conventional agricultural products from being uplinked.

The government is also becoming more aware of how e-commerce may be used as a new tool for public services such as healthcare and education in rural areas. E-commerce is expected to change the focus of poverty reduction from the distribution of goods to social and livelihood services. Additionally, it is believed that e-commerce poverty alleviation is a crucial component of the nation’s “Internet Plus” initiative.

China’s “Internet Plus” service has established a reputation in urban areas. E-commerce should provide rural citizens, especially the disadvantaged ones, with more leverage. “Make it feasible for the rural poor to benefit from the “digital dividend” and lifestyle comforts supplied by the internet” is an objective of the e-commerce poverty alleviation plan. Last but not least, e-commerce may help fight poverty by upgrading agricultural and rural regions.

The expansion of the information infrastructure into China’s vast rural areas is an essential component of the attempt to reduce poverty through e-commerce, since doing so will help provide the groundwork for the country’s broad adoption of advanced information technology.

### **Methodology, conceptual model, and research hypotheses**

The hypothetical-deductive technique was employed, which entails building a systematic relationship between the theoretical corpus of concepts and the observable reality in the field via indicators to determine the causal relationships between the various ideas. In other words, the approach includes associating each concept with measurement items capable of operationalizing the conceptual changes seen in reality. As a result of these findings, we created a conceptual model (see *Fig. 4*) that links cross-border e-commerce with the reduction of poverty [13, 15].

Recently, the “empowerment” of participants in cross-border e-commerce has received much attention [13, 14, 17]. In this literature, cross-border e-commerce has been seen as a useful tool for assisting people in establishing modern agriculture and trade.



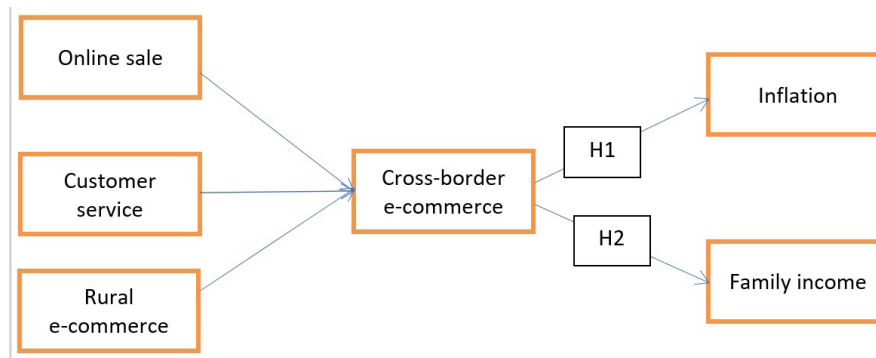


Fig. 4. Research Model

Source: Developed by the authors.

The expansion of the agricultural value chain and commodity circulation was made possible in part by e-commerce [8, 16, 19, 20]. Unlike traditional commerce, where personnel must be present in shops, e-commerce permits its workforce to work from home. For people who are forced to live in rural areas because of agricultural production or care duties, it is a very accessible type of off-farm labor. E-commerce has emerged as a possible source of revenue development in some rural communities. E-commerce-based poverty alleviation has emerged as a novel approach to the problem.

The study's hypotheses were established in the following way:

H1: Cross-border e-commerce contributes positively to poverty reduction.

H2: Online services, customer service and rural e-commerce help alleviate poverty.

## Modeling and results discussion

### Analysis of the data

By completing an empirical investigation with a sample of villages within our resources using a questionnaire survey, causal links are confirmed. Eleven villages' residents participated in the study in person. The subjects comprised both farmers and those working for small companies. Although we conducted in-person interviews with every subject who was accessible, not all members of the population were able to participate for various reasons. Approximately 55% of the population, or 62 people, were successfully interviewed by us. The study gathered data on participants' work skills, family income, and spending in 2020 and 2022 to provide a comparative method for assessing changes before and after working with cross-border e-

commerce, in addition to details on their age, gender, marital status, and level of education.

T-tests were employed to examine how work skills, income, and expenditure changed before and after the CP platform was established. using the Consumer Price Index (CPI) as a measure of inflation. Due to the small sample size, multiple regression analysis was not performed. Further studies must be conducted with a larger, more representative sample from each of the four counties. The analyses were performed using SmartPLS Software 4.0.

To assess the study model and offer support for the research topic, extrapolation of the survey sample data was performed. A graphical representation of the complete model's measurement system serves as the foundation for the model specification. At this stage, the model's numerous components are specified along with their connections, as shown in the picture below (Fig. 5).

The evaluation of the order requirement by the number of degrees of freedom must be greater than zero, according to [16]. Our model successfully validates the order requirement, and the degree of freedom is positive ( $dll = 62$ ).

The estimate of the model on all statistical units using the PLS technique, in this example, 62 Chinese villagers. The figure below was created in this manner.

With the exception of the items connected to rural e-commerce and customer service, which had comparatively insufficient correlation coefficients, we found that the measuring scales had a variety of correlation coefficients in the model estimate.

A crucial phase in the methodological modeling approach is the assessment of the quality of the

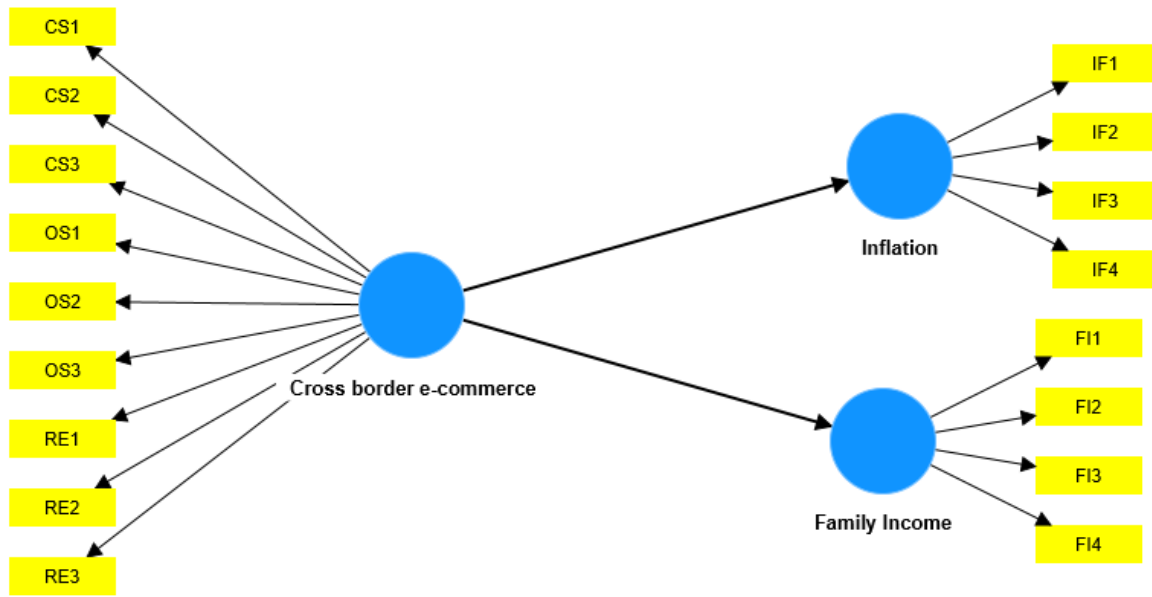


Fig. 5. SEM model specification

Source: SmartPLS v.4.

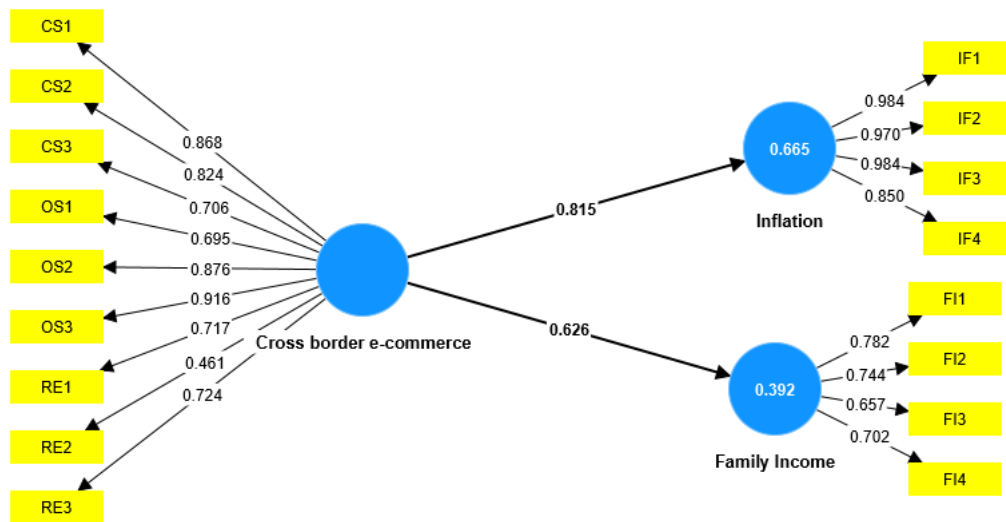


Fig. 6. SEM model estimation using the PLS algorithm

Source: SmartPLS v.3.

model modification. Since the indices' values are above the threshold values necessary for acceptable adjustment quality, the findings demonstrate a very successful model adjustment in this respect. It should be emphasized that, at present, Cronbach's alpha and Dillon-rho Goldstein's must both be greater than or equal to 0.07 in order for the construct to be considered reliable and legitimate.

Composite reliability is the examination of the correlations between the items and their latent variables. As previously mentioned, g must be greater than 0.7. Additionally, each latent

variable must have a stronger relationship with its indicators than with the other latent variables in the model in order for discriminant validity to be achieved. This suggests that each latent variable's extracted average variance (AVE) must be greater than 0.5. These findings will enable us to offer specific solutions to the issues raised throughout the debatable talks.

### Discussion of the results

Information on the effects of each aspect of inflation and family income is provided by

Table 2  
Reliability and construct validity

Dimensions	Alpha of Cronbach	Rho_A	Reliability composite	Average variance extracted (AVE)
Cross border e-commerce	0.910	0.920	0.925	0.586
Inflation	0.962	0.981	0.973	0.900
Family income	0.694	0.704	0.813	0.522

Source: SmartPLS 3.

the modeling results. According to this theory, cross-border e-commerce significantly and favorably adds to the higher end of both inflation and family income, with coefficients of 0.815 and 0.626, respectively. In this way, we can support our two study hypotheses, H1 (cross-border e-commerce helps to reduce poverty) and H2 (online services, customer service and rural e-commerce help alleviate poverty).

This conclusion can be supported by the Chinese government's national objective to reduce regional poverty overall by 2020. As a result, China has deployed an enormous number of various social innovations to provide efficient and long-lasting solutions to the ongoing poverty on the rural side that we witness.

Depending on the circumstances and resources in diverse locations stricken by poverty, one potential path would be to build market-oriented enterprises that specifically tackle the causes of poverty. It is necessary to create and enforce the work of businesses in assisting counter-poverty initiatives through digitalization in light of the significant role that cross-border e-commerce played in the current study. Capital and technological advantages of businesses can be used in market-based attempts to reduce poverty.

### Conclusion

Studies that examine the broader effects of e-commerce on decreasing poverty are few and far between. This study fills a gap in the literature by investigating how international e-commerce affects the income of poor populations. For data at the village level gathered by Chinese provinces, townships, and auton-

mous areas, we used cross-sectional analysis. To account for any potential sample bias arising from both observed and unobserved variables, the SEM model was applied.

To the best of the authors' knowledge, this study is the first to employ village-level data to establish a statistical link between cross-border e-commerce and family income. In addition, it is extensive, original, and well-researched. Our research shows that global e-commerce significantly boosts individual income.

In addition, in communities with relative poverty, this influence is U-shaped inverted.

We concluded that global e-commerce may really boost rural development and income.

Giving low-income communities the resources, they need to keep growing is the most effective way to combat poverty. Through e-commerce, particularly the skill training opportunities sometimes provided by government-sponsored e-commerce businesses, certain underprivileged people are granted additional power.

Our field study revealed that e-commerce professional skills training helps boost revenue. E-commerce might be used in conjunction with other strategies for reducing poverty and providing intellectual assistance. E-commerce poverty alleviation would make it possible for underprivileged individuals to access knowledge online, allowing underprivileged families to "open their vision" and "absorb more understanding". This type of "vision" and "understanding" immediately influences the initiative of the impoverished to end their poverty. Some impoverished people are now able to actively participate in contemporary society and benefit from modernity thanks to the expansion

of e-commerce into rural regions. E-commerce can effectively disseminate anti-poverty stories online, which might foster a societal climate of concern for underdeveloped regions.

Our study has significant policy implications. First, recent e-commerce investments have been essential for increasing income and lowering poverty. Increasing access to both hard (the internet) and soft (education) infrastructure in undeveloped areas should be the aim of policy design. Bringing digital technology and business models to poor nations will be the focus of future initiatives to eliminate poverty through e-commerce.

Along with the employment of e-commerce in rural production and administration, the digitalization of all business organizations must be accelerated. To achieve the resuscitation of rural talent on the e-commerce platform, human resources may be reinforced. In places of poverty, information infrastructure must be established. Projects to speed up the network and lower fees should be modified to better serve the poorer communities. Rural regions should see the rollout of the 5G network earlier than expected. There should be more e-commerce establishments in impoverished regions. These channels ought to incorporate multiple forms of social capital, including express, logistics, commerce, and finance.

On the internet, successful and inspiring examples of eradicating poverty in rural regions may be shared.

The development of regional brands may place a special emphasis on e-commerce. In conclusion, the “digital dividend” would only enhance rural income if the digital gap were closed.

### **Mitigations and solutions to the e-commerce poverty alleviation problem**

Infrastructure requirements exist for cross-border e-information commerce’s communication, transportation, and other components. If governments in areas of extreme poverty want to properly use e-commerce to decrease poverty, they must aggressively improve e-commerce infrastructure and further increase investment in Internet infrastructure construction. The authority is required to ac-

tively develop e-commerce services at the town (city), municipality, and village levels, use the Internet, set up an online shop for e-commerce, and help e-commerce businesses negotiate deals to provide food to undeveloped areas. The government must also look at the last-kilometer issue of rural logistics and distribution and find a solution.

### **Promote the impact of agricultural goods on brands**

The authorities of underdeveloped areas must openly encourage the growth of unique and favorable industry sectors in rural communities, expand the scope of the advancement of beneficial industries, establish a quantity of advantageous manufacturing bases, and move toward specialization, refinement, and uniformity. The state should also continue supporting local brand businesses like “geographical indication goods” and boost the attractiveness of agricultural goods. Additionally, it must improve brand development, packaging, the consumer experience, and tracing systems for online items.

### **Educating e-commerce industry leaders**

The growth of local e-commerce has recently benefited from the increasing number of young individuals who have relocated from cities to establish enterprises.

Poverty-relief agencies in impoverished communities should establish training programs for e-commerce professionals in the neighborhood and actively promote e-commerce businesses, professionals, management firms, and intermediate organizations. E-commerce business offering can be created in this way to offer unrestricted e-commerce technical training skills and entrepreneurial coaching for reworked migrant peasantworkers, town authorities with college educations, rich and powerful commanders for youths, and underemployed people with money troubles.

### **Enlarge the e-commerce development sector**

Local groups working to reduce poverty should actively encourage the comprehensive integration of regional environmental recreation, tourism, and agro-based traceability by making



full use of the advantages of modern information technology.

Visitors who partake in “country tourism” in impoverished places where the conditions are favorable for planting, breeding, and processing areas could feel the allure of “unique ecological agricultural commodities.” Using the strategy of “Net + e-commerce + tourist,” we will encourage the improvement and transformation of tourism activity in rural areas, including happy farm-

houses, wonderful countryside, scenic county places, etc.

We will establish a multitude of organizations based on blood, family, and rural kinship in the interim. Who doesn’t believe my hometown is fantastic? should be a strong breakthrough that inspires additional migrant peasant-workers and university students to start businesses, as well as more rural youth to actively participate in mobile data business.

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