

Journal of Economic Cooperation & Development

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ISSN 1308 – 7800

Volume 41, No.3, September 2020

J o u r n a l o f E c o n o m i c C o o p e r a t i o n & D e v e l o p m e n t



**Statistical Economic and Social Research
and Training Centre for Islamic Countries
(SESRIC)**

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Editorial

The current solution to the resource consumption issue and the ever-increasing consequences of climate change due to the growing human imprint, is to institute a circular economic model and transition from the linear paradigm. Utilizing public/private partnerships, the circular economic model will introduce a closed loop approach to production and consumption using environment-friendly resources, sustainable product designs, efficient industrial processes, and effective waste management systems. It is well known and proved that this adjustment can save the future and lives of people around the world. However, it is timely and difficult to integrate. There is so much capital flows ingrained into business lines that hurt the cause rather than help. Furthermore, going against the resource-intensive giants of the world can be as difficult as getting the normal consumer to adopt newer, renewable measures in their daily life. In other words, investment needs to shift to newer energy sources and education needs to trickle down to teach people everywhere on the contemporary world and future hopes to a flourishing global environment and economics. Looking further into necessary adjustments needed, we must replace the existing endorsement of finite resources, minimize waste, and move to sustainable design of materials, products, systems, and business models. This must trickle down into all aspects of the economy, across sectors and within supply chains, internationally. Given that certain global powers hold the biggest influence on business consumption, it is up to them to pressure big firms and governmental policies to shift to the circular economy. This can help the environment and overall economic development of people in all social classes. The banking world, expanding upon the conventional and Islamic based businesses, must be innovative and take a primary mover role to bringing about this transition.

This issue incorporates six distinct articles studying financial theory in global contemporary economies. In summary, each article similarly looks at the value of investment in various nations/sectors and recommends future direction for growth. We read about the continued innovation of Shariah Microfinance Institutions, effectiveness of Zakat institutions on small-scale business leaders, demographic retirement planning, correlation of insurance relevance to macroeconomic factors, oil sector control failure in Azerbaijan, contemporary European trade, capital funding in Nigerian agriculture sector,

Islamic finance stability rebounding during the current pandemic, and a current comparison of conventional and Islamic banks in Pakistan.

The first article delves into economic development strategy of Zakat institutions. The research pursues interviews with the *mustahiq*, who received productive zakat for venture capital, and heads of *amil zakat* institutions who ran programs of productive zakat for venture capital. The results of this study found that the *mustahiq* of productive zakat for venture capital tended not to show significant changes. The relatively small changes can be seen in increased income, and entrepreneurial/managerial character. The study requires long term, continued observation to find the significant changes.

The second article analyzes agricultural output in Nigeria between 1987 and 2015. The short run parameters show that commercial bank loans, agricultural credit guarantee funds, and interest rates are all positively related with agricultural output. Interestingly, we find that government expenditure is negatively related to agricultural output, suggesting an important finding that in the short run farmers' production responds more favorably through credit channels than conventional government spending. The long run results confirm that commercial bank loans, government expenditure, and the credit guarantee fund have a positive and significant relationship with agricultural output. Thus, we conclude that agricultural support policies be considered to attract more credit allocation for the agricultural sector.

The third article shows that the longstanding dominance of the extractive industry in Azerbaijan as the oil boom period (2008–2011) brought high levels of mineral revenue. The chronic overvaluation of the national currency during the oil boom, coupled with an appreciation of real wages in the mining industry that outperformed other sectors—particularly the manufacturing sector—reflect the first two symptoms of the phenomenon. In Dutch disease economies, the increased share of the services sector in the output (the third symptom of the disease) during unrecovered manufacturing (the fourth symptom) leads to a major slowdown in industrial production—also known as de-industrialization. Azerbaijan has suffered from unregulated investments, untargeted policies, and opportunistic behavior that has meant that mineral revenue has been spent rather than saved or redirected toward rebuilding the country's industrial heritage.

The fourth article purposefully examines the existing literature on trading blocks, and reviews the trade balances between CARICOM, UK and the EU with a view of determining likeness of a Post-Brexit era and policy framework for CARICOM. The main findings highlight that the impact on CARICOM following a post-Brexit will be substantial due to its large share of EU-bound trade being with the UK. Post-Brexit, the UK is likely to lose its advantage regarding customs duties, however, some of the impact will be cushioned as re-exports and channeled to the EU bypassing the UK.

The fifth article observes the disruption that COVID-19 has caused for Islamic Finance and the all the involved industries (i.e. banking, microfinance, retail, enterprise, etc.). Against such a backdrop, the present study aims to analyze the challenges posed by the COVID 19 to the Islamic finance and how disruptive technological innovation called Fintech can be utilized to address those challenges. The study also presents the critical analysis of the Islamic finance and role of Islamic finance in creating a more sustainable financial system post COVID.

The sixth article examines the comparative effects of inflation, the nominal interest rate, and their uncertainty on deposits and advances between Pakistan's conventional and Islamic banks. The article studies 25 banks from 2008-2015 and used generalized least square (GLS) estimation to combat heteroscedasticity. We find conventional banks' deposits to base significantly off the capital adequacy ratio, bank size, the inflation rate, inflation rate uncertainty, and interest rate uncertainty and volatility. Islamic banks' deposits, on the contrary, seem to depend only on the capital adequacy ratio, bank size, and the inflation rate. Conventional banks' advances show significant relationship with capital adequacy ratio, credit risk, bank size, the inflation rate, and interest rate uncertainty. Islamic banks' advances show a relationship with adequacy ratio, credit risk, bank size, inflation rate, and the interest rate.

Nebil DABUR
Editor-in-chief

The Transformation of Mustahiq as Productive Zakat Recipients in Surabaya

Muhamad Nafik Hadi Ryandono¹ and Aditya Surya Nanda²

ABSTRACT

There are still numerous less active zakat institutions carrying out the programs that direct the *mustahiq* (zakat recipients) to empower their economy. Zakat institutions tend to focus more on spiritual coaching. The fact, exploring *mustahiq*'s prospect and directing them is an essential effort in generating and developing their economic power. Therefore, this research aimed to discover how the transformation of *mustahiq* as recipients of productive zakat applied as venture capital at *amil zakat* institutions in Surabaya. This qualitative research employed a descriptive method with the interview as data collection techniques. The main interviewees were the *mustahiq*, who received productive zakat for venture capital.

ملخص

عدد قليل فقط من مؤسسات الزكاة النشطة هي التي تنفذ برامج تعنى بتمكين مستحقي الزكاة اقتصادياً. فعادة ما تركز مؤسسات الزكاة في عملها على الجانب الروحي لدفع الزكاة. وفي الواقع، يعد استكشاف إمكانات مستحقي الزكاة وتمقيدهم التوجيه اللازم لهم من العنصر الجوهرية التي قد تساهم بصورة كبيرة في إبراز وتنمية قدراتهم الاقتصادية. لذلك تتوخى هذه الورقة البحثية استكشاف كيف حصل التحول على مستوى مستحقي الزكاة بصفتهم مستفيدين من الزكاة بالمنتهج وتسخير هذه الزكاة لرأس مال المساهمة الأولى على مستوى المؤسسات العاملة على الزكاة في سورابايا. واعتمد هذا البحث النوعي منهجية وصفية قائمة على أساس المقابلات الشخصية لتقنية لجمع البيانات. ويتمثل الأشخاص الذين أجريت معهم المقابلات في مستحقي الزكاة المستفيدين من الزكاة بالمنتهج لرأس مال المساهمة الأولى.

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ABSTRAITE

De nombreuses institutions de zakat, moins actives, poursuivent les programmes qui incitent les *mustahiq* (bénéficiaires de la zakat) à renforcer leur économie. Les institutions de la zakat ont tendance à se concentrer davantage sur la guidance spirituelle. Le fait d'explorer la perspective de *Mustahiq* et de les diriger est un effort essentiel pour générer et développer leur pouvoir économique. Par conséquent, cette recherche visait à découvrir comment la transformation des *mustahiq* en bénéficiaires de la zakat productive s'appliquait comme capital-risque dans les institutions de zakat amil à Surabaya. Cette recherche qualitative a utilisé une méthode descriptive avec l'interview comme technique de collecte de données. Les principales personnes interrogées étaient les *mustahiq*, qui ont reçu la zakat productive pour le capital-risque.

Keywords: Productive Zakat, *mustahiq*, transformation, *amil zakat*, *zakat* institution

JEL Classification: A13, I38, G23, L21, Z12

In contrast, the supporting interviewees were the heads of *amil zakat* institutions who ran programs of productive zakat for venture capital. This research employed a triangulation technique to test the validity of data by obtaining information from other sources. This study found that the *mustahiq* of productive zakat for venture capital tended not to show significant changes. The changes that *mustahiq* perceived were on the increased income, their mentality in running their business, and their character. The transformation could not be achieved quickly since the transformation process would indicate the *mustahiq*'s performance in managing their business. Hence, the problems faced by the *mustahiq* included the unavailability of venture capital, their mentality, and the education organized by the *amil zakat* institutions.

1. Introduction

Zakat serves as a double purpose religious practice, a personal religious practice, and a practice supporting collective lives (Rahman, 2014). *Zakat* helps collective lives by elevating the prosperity level of the *mustahiq*, who belong to the eight groups of *asnaf* (zakat recipient groups). The principle of *mudarabah* or profit-sharing is represented in some *zakat* interpretations (Possumah, Ismail, and Shahimi, 2013). However, some

Islamic social scholars argued that there was insufficient evidence that zakat had ever eradicated poverty and performed as economic redistribution to the *ummah* (the people). Moreover, when the Prophet stopped by Medina in a short time, zakat was never effective in decreasing poverty (Abbas, 2005).

On the other hand, some other scholars argued that people could live a better life by utilizing zakat to come out from difficulties and economic problems. Therefore, *the zakat* system is required for poverty reduction and compensates for the state's incapability to provide the appropriate social welfare for the people (Kuznetsova and Round, 2014). Ryandono (2008) claimed that *zakat* held the ability to push the short-term and long-term economy. Zuhayli (2000) stated that the obligation to pay *zakat* was an essential way to resolve the social gap. Following the calculations made by Mohsin (2013), in which zakat was collected and used as explained in the Quran, the poverty in Muslim countries could be abolished. Based on its history, the *zakat* and sharia banking industry had caused significant changes from the 1980s to 2012 (Choiruzzad, 2013).

To reach the aim of zakat in social welfare, it needs zakat institutions' efforts to carry out *mustahiq's* economic activities. Counseling was conducted so that economic activities could yield good quality and value and also become beneficial for *mustahiq*. This program was expected to pull the *mustahiq* out of poverty and to cause them to run their business independently. In other words, zakat institution institutions provided productive *zakat* to the *mustahiq*. Productive *zakat* is the *zakat* given to the *mustahiq* as venture capital to run a business or an economic activity. This type of *zakat* would provide good outcomes and positive impacts on *mustahiq's* life. The expectation is that they can perform a transformation, a series of processes aimed at achieving the socio-economic welfare of the *mustahiq* to escalate them into *muzakki* (zakat donors). Thus, the unemployment rate will decrease along with the increase in people's purchasing power on either goods or services.

There are various *mustahiq* success stories in transforming their lives. Some *mustahiq* earned productive zakat yet unsuccessful in managing the *zakat* funds initially used for working capital. On the other hand, some others successfully transformed their lives with the zakat, where their lives developed and empowered well. This phenomenon was due to the shift in the zakat practice, which was initially a mere financial, religious

practice into a socio-economic/political system (Latief, 2010). For instance, several previous studies, the one carried out by Arskal Salim (2008), found that zakat was a step towards society's Islamization, especially in Indonesia. As with Jahar's (2015) explanation, Dompot Dhu'afa tried to build a *zakat* system based on modern and Islam principles to contribute to social development.

Nevertheless, there are still numerous zakat institutions that less active in carrying out the direct economic empowerment programs to the *mustahiq*. In Indonesia's case as a Muslim majority country, especially West Java, it was found that zakat institutions had not led to measurable and directed efforts to empower the society's economy (Dzikron, Nasrullah, and Shofi, 2005). Moreover, zakat institutions tend to focus more on spiritual counseling. Exploring *mustahiq*'s potential and directing them is essential in generating and developing *mustahiq*'s economic power. Besides that, only a few empirical research talked about the productive zakat program to *mustahiq* economic-social transformation.

This study aimed to understand how *mustahiq* managed and survived in running their business from the productive *zakat* they received based on their background. This study of the transformation on the *mustahiq* as the recipients of productive *zakat* for venture capital from *amil zakat* institutions in Surabaya was limited by measuring the *mustahiq*'s business success and failure.

2. Literature Review

Based on Wahab & Abdul Rahman (2012), zakat institutions are trusted bodies that manage zakat in Muslim countries. In Indonesia, the government *zakat* management is known as BAZNAS (the National *Amil Zakat* Agency). Besides that, there are *zakat* management institutions established by the communities are referred to as LAZs (*Amil Zakat* Institutions). Both institutions solicit the community to regularly give zakat, allocate, empower, and distribute the *zakat* funds.

Zakat fund can be deliver as charity purposes and empowerment program. As stated by Sarasi et al., (2019), in doing their task, zakat institutions should focus on empowerment based program for poor people, one of them is by providing needed capital to empower poor people. This is because zakat empowerment programs will raise the low income, their

capital, and increases their ability to make income (Abdelmawla, 2014). The best part of these *zakat* empowerment have carried out is by providing directions and counseling the *zakat* receivers to be appropriately distributed (Buehler and Muhtada, 2016). Within this empowerment programs, poor people will have an access to physical and financial capitals that enable them to reach welfare. Based on Nurzaman (2017), traditional *zakat* distribution like charitable and consumptive fund are no longer sufficient to liberate humankind from the downturn.

So that, *zakat* institution management should be required to empower the *mustahiq* (entitled to receive *zakat*) to become *muzakkī* (*zakat* payer) and empower humanity (Baidhawiy, 2015). Research of Ryandono & Wijayanti (2019), stated that one effective, efficient, and productive way of *zakat* management to increase *mustahiq* welfare and independence is by providing empowerment that applies social entrepreneurship principles. Social entrepreneurship principles are has a social mission and goals, empowerment, business ethics principles, social impact, and sustainability. This program aims to build the independence of *mustahiq* so that they can be separated from the dependence on *zakat* funds one day. In contrary, *Zakat* institutions that do not succeed in distribution management, would not reach the maximum primary mission of *zakat* obligation as stated in QS At. Taubah verse 60. In other aspects, *zakat* will not have a positive and significant impact on poverty's socio-economic problems (Ryandono & Wijayanti, 2019).

3. Data and Methodology

The method applied in this research was qualitative by employing a descriptive approach and case study strategy. In this study, the research subjects were the *muzakki* (*zakat* receivers) who received productive *zakat* and had been free from poverty. The collected data was primary data in the form of a direct open interview and secondary data in the forms of documentation, recording archives, and other physical items relevant to the study's objects. The data validity technique utilized in this research was the data source triangulation. This study applied the purposive method to determine the interviewees. The main interviewees in this study were the *mustahiq* who received productive *zakat* for venture capital from *amil zakat* institutions in Surabaya through empowerment program and were randomly chosen according to interviewees' availability.

In contrast, the supporting interviewees were the leaders or managers of *amil zakat* institutions in Surabaya. The reason for selecting the *mustahiq* who received productive *zakat* for venture capital was to view if *zakat*'s role in transforming their lives in the long-term. Meanwhile, the supporting interviewees were selected to determine how *amil zakat* institutions transformed the *mustahiq* and discovered their programs.

4. Results and Discussion

Some of the *mustahiq* thought to upgrade their business or even challenge themselves to start a business to pull themselves out of poverty. They did not want to live a sedentary life. They wanted to give the best outcome for their family and keep the business running well to fulfill their family needs. Though their business background and basic was initially inadequate, the *mustahiq* did not give up easily. They continued to look for ways to keep them thriving and gave the best outcome for their lives. Having passed some processes, there was no transformation in most *mustahiq*'s conditions. Only a few *mustahiq* improved. There were even two *mustahiq* who were no longer in the group of *zakat* recipients as their economy was so much better than before receiving *zakat*. Hence, it took a long period of managing the business, focusing on running it, and maintaining the *amil zakat* institutions' trust in utilizing the productive *zakat* for venture capital.

The ultimate goal of this *mustahiq* transformation was to generate new *muzakki* who contribute to the remaining *mustahiq* through *zakat* management institutions. It was undeniable that *mustahiq* possessed great potentials when optimally managed, *mustahiq* would influence the success and the progress of the nation in eradicating poverty.

The *mustahiq* variously understood the concept of transformation since each of them had different ways of thinking. Most *mustahiq* perceived transformation as a process where *mustahiq* gained better business conditions. This perspective formed the transformation that leads to an economic dimension, which was a crucial part of the impact resulting from productive *zakat*. However, some *mustahiq* defined the transformation as a manifestation of inner peace. This opinion was a manifestation of the gratitude dimension. Although they had different ideas, it could be concluded that the transformation concept was an

improvement perceived by the *mustahiq* in various dimensions, such as gratitude, politics, religious practice, and so on.

Two reasons were underlying the *mustahiq* to survive in running their business and in transforming themselves. First, they tightened the relationship with the surrounding community to ease them from living their lives, including information about productive *zakat*, especially for business capital. Second, they had experienced difficulties and poverty, which made them want to change their fate because they felt how unfortunate it was to be poor. Islam teaches people always to make efforts, pray as much as possible, and not forget to worship. No matter how hard our condition is, we still have to face it whole-heartedly. By getting closer to God, it will calm people's souls so that there will be no doubt about His sustenance that will be obtained. When running a business without counterbalanced with *tawakal* (trusting God), the company will not run well. The businessmen will always feel lacking because they are not close enough to Allah SWT.

Then, the problem was when receiving productive *zakat* for venture capital; the *mustahiq* spent it for consumptive activities instead. Supervision was essential to create the same vision and missions between the *zakat* institutions and the *mustahiq*.

4.1. The Characters of the Transforming *Mustahiq*

Mustahiq, who was capable of transforming, held particular characters in comparison to those who were not. The characters included (1) hard-working, (2) *Amanah* (trustworthy), (3) willing to cooperate, and (4) *istiqomah* (steadfastness).

Making efforts and struggling are obligations for every Muslim since more efforts and perseverance are required to achieve goals without forgetting the worship. The problem encountered by *mustahiq* was the lack of enthusiasm for working; meanwhile, most successful *mustahiq* were not lazy. Even though the business condition decreased, the successful *mustahiq* still worked as hard as possible and did not give up. They kept trying even though it was late at night so that they could complete their obligations. This achievement improved the *mustahiq*'s performance so that the obstacles and problems which were often encountered could be solved quickly. It was proven that the *mustahiq* who

worked harder were more successful in solving the often-occurring problems. The *mustahiq* who received productive zakat for venture capital had to be successful if they worked hard; thus, any problems could be smoothly solved. This hard-working character would generate people responsible for carrying out their duties as well as possible and the perseverance to obtain the best outcome.

Amanah is a character that reflects the trusts of others towards a person. Many *mustahiq* received productive zakat for venture capital, yet they misused it. Zakat should be used for venture capital for consumptive activities, causing the businesses to become undeveloped. However, for the *mustahiq*, capable of upholding the trust, they became capable of increasing the business capacity better than before receiving the productive zakat for venture capital. Some LAZ understood the *mustahiq*'s needs, so they continued to support any business carried out by the *mustahiq*. They did not interfere but reminded them if there was any misuse. Some other institutions did not care how the zakat was used because they believed that the *mustahiq* themselves *must* take the risk.

Mustahiq, who cooperated in solving problems, most likely, became more successful than those who worked individually. Working together would provide ease in all aspects, as long as it was within tolerable limits, and maintained the goodness to create a sustainable atmosphere towards all working conditions.

Istiqomah is a condition where people uphold their faith in everyday life. When facing difficulties, the person who is *istiqomah* will be patient while making efforts. *Mustahiq*, who was *istiqomah*, always struggled hard to achieve the best outcome. *Istiqomah* had positive impacts for *mustahiq* who received zakat. First, they became courageous. Muslims who hold *istiqomah* will not be afraid to face any tests God gives since the strong belief will form a tough character that is not easily worried about living life. The *mustahiq* who always held onto *istiqomah* still became the best ones. The second reason was inner peace. The *mustahiq* assumed that the wealth obtained in a *halal* way (righteous way) would bring inner peace and become the key to life perfection. Third, they became an optimist. *Mustahiq*, who received productive zakat for venture capital, tend to be courageous in living their lives. They felt happier because their businesses could develop well. Still, their lives became better since it was God's

repayment to those who obeyed Him and always be *istiqomah* in living their lives.

Fourth, giving charity. Many *mustahiq* set aside a part of their wealth, between Rp5,000 to Rp50,000, depending on the charity's income. The more frequently they gave charity, the better the business development was because the blessings they obtained would help develop their business either directly or indirectly. This religious command carried out by the *mustahiq* was a manifestation of their obedience to religion along with the solicitation proposed by LAZ to set aside their wealth for charity for good causes as a medium to cultivate the economy for those who were in need. Fifth, pray frequently. A manifestation of gratitude to God was by keep praying, which encouraged the *mustahiq* to be more devoted and be included as the pious ones. The eminence of people who frequently pray is that they gain the spirit to work and become capable of overcoming their life problems. The *zakat* institutions' spiritual guidance emphasizes the *mustahiq* not to forget praying, especially *salat* (the obligatory five-time prayers) because it would often bring positive impacts either directly or indirectly. A person's worship is reflected in the prosperity which he/she will obtain as the more frequent that worship, the more they will receive. Sixth, accepting change. Accepting the difference is a responsive character towards living conditions. People who hope to change their life will encourage themselves to keep making efforts and not giving up on the conditions they face. The *mustahiq*, who was capable of accepting the changes, gained satisfactory results from their efforts. Taking advantage of the opportunities was among the *mustahiq*'s strategies to improve their business. As information and technology development could not be avoided, it would help increase the business outcome if appropriately used.

4.2. The Implementation of Productive Zakat

Zakat distributions carried out by LAZ were manifested by providing *zakat* for venture capital addressed to the *mustahiq*, who had followed LAZ's spiritual coaching in a certain period to strengthen their faith. The spiritual guidance aimed to increase devotion to God so that the previously still lacking worship can be maintained and motivated in the *mustahiq*'s life. At that point, the institutions provided understanding and socialization about productive *zakat* for venture capital addressed for the

mustahiq, who had entrepreneurship skills to be independent and increase their business capacity.

The money earned from the *zakat* institutions could provide the opportunity for the *mustahiq* to manage it to become a source of capital so that the production increased, followed by an increase in their production capacity. The hawker carts given for the *mustahiq* were also expected to increase the business's value as the customers grew more convinced by the existence of the hawker carts. Besides, to look clean, the carts put a more luxurious impression than the previous venture. The blessings gained from it had caused the business run by the *mustahiq* improve, enabling them to transform better and get better income than the previous venture.

The use of capital for business aimed *mustahiq* to be more independent in running their business. In general, the money could be used optimally to meet the entrepreneurship needs without suffering from lacking. Many *mustahiq* recipients of productive *zakat* for venture capital used the *zakat* to fulfill the business needs as only a few of them used it for consumptive needs. The LAZs fully handed the productive *zakat* to the *mustahiq*, so they had to be capable of keeping the trust given by the LAZs to meet the commitment previously mandated.

Education was essential for the *mustahiq* so that they grew capable of utilizing productive *zakat* for venture capital efficiently and adequately. The LAZs' obligation was to provide education to the *mustahiq*, including delivering Islamic understanding through spiritual coaching, which was the foundation of everyday life. This spiritual coaching would increase the faith and devotion to God and growing confidence in the undertaken business. The LAZs always provided education to the *mustahiq*. The one which was frequently carried out was spiritual coaching. LAZs understood the importance of spiritual coaching. With such programs, the knowledge related to entrepreneurship included the one that would strengthen the *mustahiq's* ability to manage their business. However, there was a problem that often occurred. Not all LAZs paid attention to entrepreneurship education. Some LAZs tend to let go of the *mustahiq*, who had received *zakat* without giving any guidance so that the *mustahiq* had the ability that indicated development. Besides, many *mustahiq* could not participate in the education carried out by *zakat* institutions because of their activities in managing their business. Nevertheless, the LAZs

considered spiritual guidance as to the most prominent one that was used as a guide in sorting out the *mustahiq* to receive the fund ran their business.

5. Conclusion

Productive zakat aimed to transform the *mustahiq* to be free from poverty, be independent in entrepreneurship, and successfully improve their economic standards by using productive zakat obtained from the LAZs. Nonetheless, the productive zakat for venture capital provided by LAZ was relatively small, and they must wait for a certain period to get it, so the outcome could not meet the LAZs' expectations.

Most of the *mustahiq* spent the productive zakat properly to add their venture capital. However, there were a few zakat recipients who paid the productive zakat for consumptive needs. Most *mustahiq* encountered progress in their business because the productive zakat in venture capital could increase their business capacity. Nonetheless, the increase was not balanced with the guidance and further training from some LAZs. Thus, the *mustahiq* as recipients of productive zakat for venture capital tend not to show significant changes.

The transformation on the *mustahiq* who received productive zakat for venture capital in running business included (1) the increase in income, (2) the emergence of the characters of hard-working, *Amanah*, *istiqomah*, able to cooperate, diligent, high-principled as well as intense worship, and (3) eager to develop the business which could become the impetus in running independent business consistently.

The problems often encountered by the *mustahiq* included (1) the difficulty of capital due to the misuse of money, (2) incapability of maintaining their mentality, trust, and intention to remain focus on the business goals, and (3) the seemingly less effective education provided by the LAZs to transform the *mustahiq*.

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Do Agricultural Support Policies Work in Nigeria? Evidence from an ARDL Model

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ABSTRACT

This study analyzes agricultural output in Nigeria between 1987 and 2015 by modeling the existence of a long run relationship between agricultural output, bank credit allocation to the agricultural sector, government spending on agriculture, and interest rates. We employ an error correction model within an autoregressive distributed lag (ARDL) framework as suggested by Pesaran *et al.* (2001). Results from the bounds testing confirm the existence of a long run relationship among the variables. The short run parameters show that commercial bank loans, agricultural credit guarantee funds, and interest rates are all positively related with agricultural output. Interestingly, we find that government expenditure is negatively related to agricultural output, suggesting an important finding that in the short run farmers' production responds more favorably through credit channels than conventional government spending. The long run results confirm that commercial bank loans, government expenditure, and the credit guarantee fund have a positive and significant relationship with agricultural output. Based on our empirical findings, the study recommends that agricultural support policies be considered to attract more credit allocation for the agricultural sector.

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ملخص

تحلل هذه الدراسة الإنتاج الزراعي في نيجيريا خلال الفترة الممتدة بين عامي 1987 و 2015 من خلال عرض مدى وجود علاقة طويلة الأمد بين الإنتاج الزراعي ومخصصات القروض البنكية لقطاع الزراعة والإنفاق الحكومي على الزراعة ومعدلات الفائدة. فقد وظفنا نموذجاً لتصحيح الخطأ في إطار نموذج الانحدار الذاتي للابطاء الموزع (ARDL) كما يقترح بيزاران وآخرون (Pesaran et al., 2001). وتؤكد النتائج الخاصة باختبار الحدود وجود علاقة طويلة الأمد بين مختلف المتغيرات. وتشير المعايير القصيرة الأمد إلى أن القروض التجارية للبنوك وصناديق ضمان الائتمان الزراعي ومعدلات الفائدة كلها عناصر مرتبطة ارتباطاً وثيقاً بالإنتاج الزراعي. والمثير للاهتمام هو أننا توصلنا لكون الإنفاق الحكومي لا يرتبط بشكل وثيق بالإنتاج الزراعي، وهذا يعني أن مستوى إنتاج المزارعين، على المدى القصير، حين يرتبط بقنوات الائتمان يكون أحسن بالمقارنة مع الحالات التي يرتبط فيها بقنوات الإنفاق الحكومي التقليدية. وتؤكد النتائج الطويلة المدى أن القروض التجارية للبنوك والنفقات الحكومية وصناديق ضمان الائتمان الزراعي مهمة جداً على مستوى الإنتاج الزراعي وترتبط به ارتباطاً وثيقاً. وبناءً على النتائج التجريبية التي توصلنا إليها، توصي الدراسة بالأخذ بعين الاعتبار سياسات الدعم الزراعي لجذب المزيد من مخصصات القروض للقطاع الزراعي.

ABSTRAITE

Cette étude analyse la production agricole au Nigeria entre 1987 et 2015 en modélisant l'existence d'une relation à long terme entre la production agricole, l'allocation de crédits bancaires au secteur agricole, les dépenses gouvernementales pour l'agriculture et les taux d'intérêt. Nous utilisons un modèle de correction d'erreur dans un cadre de retard distribué autorégressif (ARDL), comme le suggèrent Pesaran et al. (2001). Les résultats des tests de limites confirment l'existence d'une relation à long terme entre les variables. Les paramètres à court terme montrent que les prêts des banques commerciales, les fonds de garantie du crédit agricole et les taux d'intérêt sont tous en relation positive avec la production agricole. Il est intéressant de constater que les dépenses publiques ont un rapport négatif avec la production agricole, ce qui suggère une conclusion importante, à savoir qu'à court terme, la production des agriculteurs répond plus favorablement par les canaux du crédit que les dépenses publiques traditionnelles. Les résultats à long terme confirment que les prêts des banques commerciales, les dépenses publiques et le fonds de garantie du crédit ont une relation positive et significative avec la production agricole. Sur la base de nos conclusions empiriques, l'étude recommande que les politiques de soutien agricole soient envisagées pour attirer davantage de crédits pour le secteur agricole.

Keywords: agricultural policy, cointegration, ARDL Bounds Test, bank credit

JEL Classification: O2, O13

1. Introduction

Nigeria is a country endowed with an abundance of fertile land, water sources, forests and grasslands, as well as a large population that can sustain a productive and profitable agricultural sector (Nweze, 2014; Adubi, 2000; Obadan, 2000; Anyanwu, 1997). Nigeria also has a highly diversified agro-ecology, which makes possible the production of a wide range of agricultural products. This enormous resource base could support a vibrant agricultural sector, capable of self-sufficiency in food, raw materials for the industrial sector, gainful employment and the accumulation of foreign exchange through exports (CBN, 2000). Despite this enormous endowment, Nigeria spends about 60 per cent of its total crude oil revenue on food imports, among the highest in the world.⁶ There has been an increase in the incidence and severity of poverty in Nigeria, arising in part from the sluggish performance of the agricultural sector where a preponderance of the poor is employed. In response, the government has initiated numerous policies and programs aimed at increasing productivity and output in the agricultural sector.

One of the oft-cited challenges of the Nigerian agricultural sector is inadequate funding by both the government and the private sector. Khandker and Binswanger (1989) argue that credit to the agricultural sector is important because agents in the sector who suffer from a cash flow problem and a liquidity constraint may use sub-optimal inputs. Farmers need financial resources to invest in improved agricultural inputs and technique to increase their output and income level and break the cycle of poverty. Investment in these technologies is usually not feasible without organizations and systems that are capable of adequately providing rural financial services to farmers. Consequently, the effort to develop agriculture may be ineffective in the absence of expanding access to credit for small farmers. Access to credit and agricultural extension services is limited in rural settings. Indeed, about 65% of Nigeria's labor force in the agricultural sector lack access to formal financial services

⁶In 2010 alone, Nigeria spent ₦635 billion on wheat imports, ₦356 billion on rice imports, ₦217 billion on sugar imports, and ₦97 billion imports of fish.

(CBN, 2007). Financial market underdevelopment and disintermediation in less developed countries (LDCs) is often characterized by high interest rates and inadequate financing for both agricultural and non-agricultural activities. Few people have access to financial services because commercial banks consider lending to small farmers risky and costly. Such lending farmers is marked by high transaction costs, low collateral and managerial skill, and insufficient record-keeping. The financial constraint also impacts other parts of the farm's production function, which results in lower human capital, lower infrastructure investments, and reliance on household labor relative to larger firms (Ishrat *et al.*, 2019).

Several scholars have investigated the relationship between bank credit and agricultural performance in Nigeria.⁷ These studies employ a variety of statistical and econometric techniques, but focus primarily on the long run relationship between bank credit and agricultural output.⁸ This paper contributes to the existing literature by estimating both the short run and long run relationships between bank credit allocation and agricultural output in Nigeria using the Autoregressive Distributive Lag (ARDL) bounds testing approach of Pesaran and Shin (1996) and Pesaran *et al.* (2001). In addition, we test the effectiveness of two agricultural support policies aimed at increasing farmers' production. The paper is organized as follows. In section 2, we review the existing literature and focus on empirical studies of agricultural output in developing countries. The theoretical basis for the ARDL modeling strategy is described in section 3, followed by a discussion of the results in section 4. Section 5 offers some concluding remarks and potential avenues for future research.

2. Related Literature

Most of the literature has heretofore focused on the relationship between institutional credit and agricultural output. For example, Qureshi *et al.* (1992) analyze rural credit policy in Pakistan. Their study observed that institutional credit affects agricultural output through the financing of

⁷ These studies include Aduralere (2019), Kolawole (2013), Obilor (2013), Salami and Arawomo (2013), Toby and Peterside (2014) and Anthony *et al.*, (2015).

⁸ Other studies using similar methods include Rahji and Fakayode (2008), Olagunju and Adeyemo (2007), Oboh and Ekpebu (2011), and Adetiloye (2012).

capital investment.⁹ Iqbal *et al.* (2003) study the impact of institutional credit on agricultural production in Pakistan and found that institutional credit and the share of production loans in total loan advanced has been increasing from 1981 to 1990s. Their regression analysis confirmed that institutional credit is directly related to agricultural production. Water availability at the farm gate, labor and cropping intensity are the other variables that positively affect agricultural output.

Olangunju and Adeyemo (2007) investigate the extent to which the Small Holder Loan Scheme (SHLS) program has been able to meet the credit needs of farmers to improve agricultural production in Nigeria. Their study evaluated the production efficiency of farmers participating in the credit scheme. Using regression on a sample of 216 beneficiaries, they found significant differences in the production behavior of farmers who received loans. Farmers who received a loan were more productive than those that did not. Such findings are not unique to Nigeria. Artha and Dartanto (2018), Ismail *et al.* (2017) and Kasali *et al.* (2016) provide evidence that access to microcredit can lessen supply constraints, increase farm productivity, and alleviate poverty.

Iganiga and Unemhilin (2011) examine the effect of federal government agricultural expenditure on the value of agricultural output in Nigeria, from 1970 to 2008 using total commercial credits to agriculture, consumer price index, annual average rainfall, population growth rate, food importation and GDP growth rate as the model variables. The study employed the Cobb-Douglas growth model and Johansen co-integration and the error correction mechanism methodology to distill both long-run and short-run dynamic impacts of these variables on the value of agricultural output. Their results indicate that federal government capital expenditure was positively related to agricultural output.

Examining the dual role of commercial and non-commercial agricultural credit, Anthony *et al.* (2015) model the role of farm credits from banks and agricultural credit guarantees on the growth of the agricultural sector in Nigeria between 1988 and 2011. Results from their analysis reveal that both bank loans and the agricultural credit guarantee fund have a positive relationship with the output of the agricultural sector. Using standard

⁹They also find that the responsiveness of agricultural output is larger to institutional credit than that of output to fertilizer.

OLS estimation, they find that the agricultural credit guarantee fund and bank deposit interest rate are both insignificant.

Adetiloye (2012) and Obilor (2013) evaluate the impact of commercial banks' credit to agricultural sector performance under an agricultural credit guarantee fund (ACGSF) in Nigeria, spanning from 1978 to 2006, and 1983 to 2001 respectively. The ACGSF is one of the policies used by the Nigerian government to support farmers and the agricultural sector. Established in 1978, this program is an effort by the government (in collaboration with the central bank) to ameliorate the constraints faced by farmers in accessing credit facilities. The purpose of the fund is to guarantee credit facilities extended to farmers up to 60 percent of the total sum in default net of any security realized (Nwosu *et al.*, 2010). That is, government covers losses up to 60 percent arising from failure of the farmers to repay the loan due to unforeseen circumstances, while the banks in direct contact with the farmers bear the remaining 40 percent (Atagana and Kalu, 2014). Adetiloye (2012) finds that the ACGSF variable is positive and significant, but notes that funding has not been maintained relative to the growth of the economy. The study recommends public awareness campaigns and programs to bring the youth into agriculture and the management of the ACGSF by highly trained professionals.

Kolawole (2013) examines the impact of interest rates and other macroeconomic variables on agricultural performance in Nigeria, from 1980 to 2011. Constructing a vector error correction model (VECM), they find a negative relationship between agricultural value added and the interest rate spread in the country. Finally, Chisasa and Makina (2015) analyze the relationship between bank credit and agricultural output in South Africa, using data from 1970 to 2011. Bank credit and agricultural output are found to be cointegrated, and in the long run credit and capital formation have a significant positive impact on agricultural output. Perhaps unexpected, the VECM reveals a short run negative relationship between bank credit and agricultural output. This result could be attributed to the credit cycle whereby banks may require farmers to repay loans even before harvesting and selling their produce (i.e., a mismatch

between production and repayment cycles would adversely affect output).¹⁰

3. Methodology

The objective of this study is to investigate the relationship between bank credit allocation and agricultural sector performance in Nigeria. We estimate an ARDL model that hypothesizes an endogenous long run relationship among the following variables:

$$agdp = f(cbla, gexpa, acgsf, intr) \quad (1)$$

where *agdp* is agricultural performance proxied by agricultural GDP; *cbla* is bank credit proxied by commercial bank loans to the agricultural sector; *gexpa* is government expenditure (in local currency) on the agricultural sector; *acgsf* is the value of the agricultural credit guarantee fund (in local currency), and *intr* is the interest rate for one-year bank deposits.

3.1 Model specification

We posit that access to bank credit (*cbla*) and agricultural support programs (*gexpa* and *acgsf*), will, *ceteris paribus*, positively influence agricultural output (*agdp*). As a measure of the cost of borrowing, the interest rate (*intr*) is often hypothesized to have a negative impact on output. However, there are several complicating factors that make any *a priori* assumptions about the relationship between the interest rate and agricultural output unclear.¹¹

An econometric form of equation (1) is expressed as:

$$agdp_t = \beta_0 + \beta_1 cbla_t + \beta_2 gexpa_t + \beta_3 acgsf_t + \beta_4 intr_t + \xi_t \quad (2)$$

where β_0 is the constant; $\beta_1 \dots \beta_4$ are the coefficients of the variables, and ξ_t is the stochastic error term. Equation (2) is re-specified in log form as:

¹⁰ High interest rates charged on loans to farmers, and the uncertain nature of agricultural output are likely contributing factors. Notwithstanding the negative impact in the short term, the adjustment process to positive equilibrium position is rapid and evidenced with a highly significant, negative error correction coefficient.

¹¹ These factors include the elasticity of agricultural output to the interest rate, and the business cycle.

$$\ln agdp_t = \beta_0 + \beta_1 \ln cbla_t + \beta_2 \ln gexpa_t + \beta_3 \ln acgsf_t + \beta_4 \ln intr_t + \zeta_t \quad (3)$$

3.2 Estimation technique

Most studies using endogenous time series data have employed the Johansen cointegration technique to determine the long-term relationships among variables of interest. This remains the technique of choice for many researchers who argue that it is the most accurate method to apply for $I(1)$ variables. However, a series of papers by Pesaran¹² introduced an alternative to cointegration known as the autoregressive distributed lag (ARDL) bounds test. This technique has several advantages over the Johansen cointegration technique.

First, the ARDL model is a more statistically significant approach to determining the cointegration relation in small samples (Ghatak and Siddiki, 2001), while the Johansen cointegration techniques require large data samples for validity. A second advantage of the ARDL approach is that while the cointegration technique requires all the regressors to be integrated of the same order, the ARDL approach can be applied whether the regressors are $I(1)$ or $I(0)$. Thus, the ARDL approach avoids the pre-testing problems associated with standard cointegration, which requires that the variables be already classified into $I(1)$ or $I(0)$ (Pesaran *et al.*, 2001). According to Pesaran and Pesaran (1997), the ARDL approach requires two steps. In the first step, the existence of any long-term relationship among the variables is determined using an F-test. The second step of the analysis involves an estimation of the coefficients of the long run relationship and determination of their values, followed by the estimation of the short run elasticity of the variables with an error correction representation of the ARDL model. By applying the ECM version of the ARDL, the speed of adjustment to equilibrium can be computed. The ARDL model is represented by equation (4).

$$\phi(L, p)y_t = \sum_{i=1}^k \beta_i(L, q_i)x_{it} + \delta'w_t + u_t \quad (4)$$

where

$$\phi(L, p) = 1 - \phi_1 L - \phi_2 L^2 - \dots - \phi_p L^p$$

and

¹² Pesaran and Shin (1996); Pesaran and Pesaran (1997); Pesaran and Smith (1998) and Pesaran *et al.* (2001). $\beta_i(L, q_i) = \beta_{i1} - \beta_{i2}L - \dots - \beta_{iq_i}L^{q_i}$, $i = 1, 2, \dots, k$

In equation (4), y_t is the dependent variable, x_{it} denotes the independent variables, L is a lag operator, and w_t is a vector of deterministic variables, including intercept terms, dummy variables, time trends and other exogenous variables. The optimum lags are selected according to the Akaike Information Criterion (AIC) and Schwarz Bayesian Criteria (SBC). The long-run coefficients and their asymptotic standard error are then computed for the selected ARDL model.

The ECM version of the selected model can thus be obtained by writing equation (4) in terms of the lagged levels and the first difference of y_t , x_{it} , and w_t as follows:

$$\Delta y_t = -\phi(1, \hat{p})EC_{t-1} + \sum_{i=1}^k \beta_{i0} \Delta x_{it} + \delta' \Delta w_t - \sum_{j=1}^{\hat{p}-1} \varphi^* y_{t-j} - \sum_{i=1}^k \sum_{j=1}^{\hat{q}_{i-1}} \beta_{ij}^* \Delta x_{i,t-j} + u_t \quad (5)$$

In equation (5) above, ϕ , δ and β_{ij} are the coefficients related to the short run dynamics of the model's convergence to equilibrium, and $\phi(1, \hat{p})$ is the speed of adjustment. The bounds test for this study starts with the estimation of an unrestricted error-correction model (UECM) of the form:

$$\Delta \ln agdp_t = \beta_0 + \sum_{i=0}^n \beta_{1i} \Delta \ln cbla_{t-i} + \sum_{i=0}^n \beta_{2i} \Delta \ln gexpa_{t-i} + \sum_{i=0}^n \beta_{3i} \Delta \ln acgsf_{t-i} + \sum_{i=0}^n \beta_{4i} \Delta \ln intr_{t-i} + \xi_t \quad (6)$$

where Δ is a first difference operator and ξ_t is the stochastic disturbance term assuming white noise is normally distributed.

4. Empirical Results

We used the annual value of agriculture output in Nigeria to measure the performance of the agricultural sector. Commercial bank loans to agriculture represents the total commercial bank credit given to the agricultural sector while the agricultural credit guarantee fund is a government policy aimed at supplementing bank credit for the agricultural sector. The interest rate variable reflects the cost of borrowing in the economy. The time series data were collected from the Central Bank of Nigeria Statistical Bulletin for the period of 1987 to 2015. Descriptive statistics of the variables, which are all normally distributed, are shown in Table 1.

Table 1: Descriptive Statistics

Variable	Observations	Mean	Std. Dev.	Min	Max
lnagdp	36	13.3637	2.490869	9.21149	16.86003
lncba	36	9.867496	2.067113	6.135998	13.12547
lnexpa	36	7.34586	2.974377	2.549445	11.08828
lnacgsf	36	13.10121	2.2139057	10.19939	16.45457
intr	36	17.69176	4.767831	7.8	29.8

In Tables 2 and 3 below, the Augmented Dickey Fuller (ADF) and Phillips-Perron (PP) unit root tests confirm that all the variables for this study are non-stationary at level excluding the interest rate. This implies the existence of unit roots. Both tests confirm that they are stationary after first difference. Therefore, the variables are integrated of order one, $I(1)$, except for the interest rate, which is integrated of order zero, $I(0)$. The results of these tests support the choice of an ARDL estimation technique. Next, we test for the existence of a cointegrating relationship among the variables.

Table 2: Unit root test (Augmented Dickey Fuller test)

Levels						First difference					
Variable	t-statistic	Critical values			Prob.	Variable	t-statistic	Critical values			Prob.
		1%	5%	10%				1%	5%	10%	
lnagdp	-1.330	-3.68	-2.97	-2.61	0.6152	lnagdp	-4.353	-3.68	-2.9	-2.61	0.004**
lncba	-0.929	-3.68	-2.97	-2.61	0.7782	lncba	-6.769	-3.68	-2.9	-2.61	0.0000**
lnexpa	-1.158	-3.68	-2.97	-2.61	0.6915	lnexpa	-8.204	-3.68	-2.9	-2.61	0.0000**
lnacgsf	-0.090	-3.68	-2.97	-2.61	0.9504	lnacgsf	-6.162	-3.68	-2.9	-2.61	0.0000**
intr	-3.271	-3.68	-2.97	-2.61	0.016**	intr	-9.883	-3.68	-2.9	-2.61	0.0000**

** indicates significance at the 5% level

Source: Authors' computation using Stata 13

Table 5 shows the long run and short run estimates for the variables of this study. The long run elasticities for bank credit allocation to agriculture, government expenditure on agriculture, the ACGS fund and interest rate are 0.39, 0.39, 0.18 and 0.02 respectively. The estimates carry the expected signs and are statistically significant at the 5 percent level except for the interest rate, which is not significant. The results imply that for a one percent increase in bank credit allocation to agriculture, there is a 0.39 percent increase in agricultural output. Moreover, a one percent increase in government expenditure on agriculture induces a 0.39 percent increase in agricultural output, and a one percent addition to the agricultural credit guarantee fund leads to a 0.18 percent increase in agricultural output.

Table 5: Results of autoregressive distributed lag (ARDL) model

Dependent Variable $\Delta \ln agdp$	Coef.	Std. Err.	t-stat	Prob.
Error Correction term EC_{t-1}	-0.4537***	.1330	-3.41	0.004
Long Run Model				
$\ln cbla$	0.3950***	.1313	3.01	0.009
$\ln gexpa$	0.3990***	.0832	4.79	0.000
$\ln acgsf$	0.1819***	.0564	3.22	0.006
$\ln tr$	0.0217	.01757	1.24	0.235
Short Run Model				
$\Delta \ln cbla_{t-2}$	0.1567*	.0774	2.02	0.061
$\Delta \ln gexpa$	-0.1263**	.0439	-2.88	0.012
$\Delta \ln gexpa_{t-1}$	-0.1136***	0.036	-3.11	0.007
$\Delta \ln gexpa_{t-2}$	-0.1128***	.0280	-4.02	0.001
$\Delta \ln acgsf_{t-2}$	0.1231**	.0551	2.23	0.041
$\Delta \ln tr_{t-1}$	-0.0146**	.0063	-2.32	0.035
$\Delta \ln tr_{t-2}$	-0.0104**	.0047	-2.32	0.042
constant	1.836	.5230	3.51	0.003

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

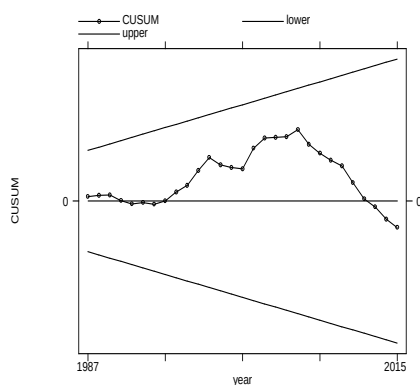
The coefficients for the short run estimates in Table 5 are significant and correctly signed, apart from $\Delta \ln gexpa$. The hypothesized positive affect of government spending on agriculture in the short run is rejected, but it is not entirely unexpected. Government expenditures on agriculture may

not yield the desired impact instantaneously due to various implementation lags, and most agricultural ventures take some time to yield output. Furthermore, rent-seeking and corruption—particularly in the short run when it can be difficult to audit programs—cannot be ruled out as a possible explanation as well. According to our estimates, the elasticity of bank credit to agriculture is 0.15 and is (weakly) significant, while that of the ACGSF fund and interest rate are 0.12 and 0.14 respectively, and both are significant at the 5 percent level.

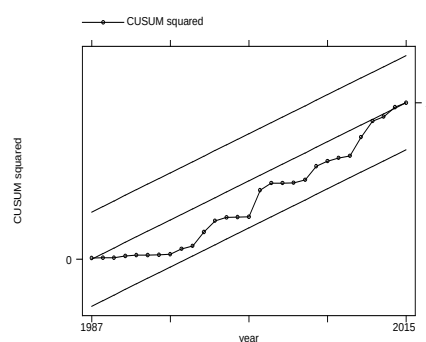
The error correction term, EC_{t-1} , carries the correct (negative) sign and is statistically significant at the one percent level. This confirms the existence of a long run relationship among the model variables. The error correction term coefficient of -0.45 implies that following a shock, the variables will return to their long run equilibrium at a rate of approximately 45 percent per year. In Figure 1, we confirm the stability of the parameters with the Cumulative Sum and the Square of the Cumulative Sum tests for recursive residuals. Other standard diagnostic tests indicate that the model conforms to standard statistical properties.¹³

Figure 1: Cumulative Sum (CUSUM) Test for Stability

(a) CUSUM at 5% Significance



(b) CUSUM of Square at 5% Significance



¹³ The Ramsey RESET test shows that the model for this study is well specified, while the Breusch-Godfrey LM test for serial autocorrelation indicates that there is no serial correlation. The Lagrange Multiplier Jarque-Bera Normality test confirms that the error terms are normally distributed. Lastly, White's test demonstrates the model's errors are homoscedastic. These test results are available as an appendix upon request from the authors.

5. Conclusion

In this paper, we estimated the impact of credit and government support programs on agricultural performance in Nigeria. We employed an autoregressive distributed lag (ARDL) bounds testing approach to model the long run equilibrium relationship among the variables. The diagnostic tests confirmed the model is robust, reasonably specified, stable with normally distributed errors, and has no autocorrelation.

The long run estimates reveal that commercial bank loans, government expenditure, and the ACGS fund each has a significant, positive relationship with agricultural output. The interest rate is not statistically significant. In the short run analysis, the Wald test confirms a positive joint effect of commercial bank loans, agricultural credit guarantee fund and the interest rate on agricultural output. However, the coefficient of government expenditure (*Ingexpa*) is negative, suggesting an important finding that in the short run agricultural output responds more favorably through credit channels than conventional government spending.

These results hold policy implications for both individual investors and the government of Nigeria. Our findings imply that agricultural output can be increased through targeted credit and spending levers. Given the enormous potential of the agricultural sector in Nigeria, government can complement private sector investment by increasing credit allocation to farmers. Government spending on public goods and infrastructure (e.g. accessible roads, power supply and security) would also be a cost-effective policy that would likely attract private sector participation and crowding-in investments. A limitation of the study is based on the relatively small data set of a single country. The results for Nigeria may not hold more generally, and thus future research that applies the ARDL and panel methods to other developing countries has great promise.

Acknowledgments

Funding for this research was provided by the TETUFUND. The authors are grateful for the comments and suggestions from the anonymous referees, which greatly improved the quality of the paper.

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Dutch Disease Symptoms in Azerbaijan Economy

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ABSTRACT

The longstanding dominance of the extractive industry in Azerbaijan has created a situation that can be understood with the help of the Dutch disease model. The oil boom period (2008–2011) brought high levels of mineral revenue. The chronic overvaluation of the national currency during the oil boom, coupled with an appreciation of real wages in the mining industry that outperformed other sectors—particularly the manufacturing sector—reflect the first two symptoms of the phenomenon. In Dutch disease economies, the increased share of the services sector in the output (the third symptom of the disease) during unrecovered manufacturing (the fourth symptom) leads to a major slowdown in industrial production—also known as de-industrialization. Azerbaijan has suffered from unregulated investments, untargeted policies, and opportunistic behavior that has meant that mineral revenue has been spent rather than saved or redirected toward rebuilding the country's industrial heritage. This study evaluates the presence of Dutch disease in Azerbaijan using the available statistical data and through comparisons with other resource-rich countries to outline policy recommendations.

ملخص

ساهمت الهيمنة الطويلة الأمد لقطاع الصناعة التعدينية في أذربيجان في خلق وضع يمكن تحليله وفهمه بشكل جيد من خلال اعتماد نموذج المرض الهولندي. فقد نتج عن فترة الطفرة النفطية (2008-2011) مستويات عالية من إيرادات المعادن. ويمثل عاملي التقدير المفرط للعملة الوطنية خلال فترة الطفرة النفطية والزيادة في الأجور الفعلية في مجال الصناعة التعدينية التي تفوقت على باقي القطاعات، لا سيما قطاع التصنيع، أولى أعراض هذه الظاهرة. وفي الاقتصادات المتأثرة بالمرض الهولندي، تؤدي الحصة المرتفعة لقطاع الخدمات في الإنتاج (العرض الثالث للمرض) في مرحلة التصنيع غير المسترد (العرض الرابع) إلى تباطؤ كبير في الإنتاج الصناعي، وهو ما يعرف أيضا بانخفاض الأهمية النسبية للتصنيع. وتتميز أذربيجان بمرحلة تتميز بوجود استثمارات غير منظمة وسياسات غير واضحة الأهداف وسطوة السلوكيات الانتهازية، أي أن عائدات المعادن يتم إنفاقها بدلا من توفيرها أو إعادة توظيفها في إطار إعادة بناء التراث الصناعي للبلد. وهذه الدراسة تقيم مدى وجود المرض الهولندي في أذربيجان من خلال الاعتماد على البيانات الإحصائية المتاحة ومن خلال إجراء مقارنات مع باقي البلدان الغنية بالموارد، وذلك بهدف رسم توصيات متعلقة بالسياسات.

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ABSTRAITE

La domination durable de l'industrie extractive en Azerbaïdjan a créé une situation qui peut être comprise à l'aide du modèle de la maladie hollandaise. La période du boom pétrolier (2008-2011) a apporté des niveaux élevés de revenus miniers. La surévaluation chronique de la monnaie nationale pendant le boom pétrolier, associée à une appréciation des salaires réels dans l'industrie minière qui a dépassé les autres secteurs - en particulier le secteur manufacturier - reflète les deux premiers symptômes du phénomène. Dans les économies touchées par le syndrome hollandais, la part accrue du secteur des services dans la production (le troisième symptôme de la maladie) lors de la fabrication non valorisée (le quatrième symptôme) entraîne un ralentissement majeur de la production industrielle - également appelé désindustrialisation. L'Azerbaïdjan a souffert d'investissements non réglementés, de politiques non ciblées et de comportements opportunistes qui ont fait en sorte que les revenus miniers ont été dépensés plutôt que sauvés ou réorientés vers la reconstruction du patrimoine industriel du pays. Cette étude évalue la présence du syndrome hollandais en Azerbaïdjan en utilisant les données statistiques disponibles et en effectuant des comparaisons avec d'autres pays riches en ressources afin de définir des recommandations politiques.

Keywords: Dutch disease, Azerbaijan, Real effective exchange rate, Real wages, Increased services, Industrial slowdown

JEL Classification: F41, F43, L60, P27, Q33

1. Introduction

Dutch disease occurs when a shift in production factors occurs in the favor of booming export sector(s), leading to increased price levels of non-tradables. These patterns lead to an appreciation in real wages in booming sectors, real effective exchange rate overvaluation, de-industrialization of manufacturing, and eventually to a loss of competitiveness among non-booming sectors. The original theory (Corden and Neary, 1982; Corden, 1984) differentiates between the two effects of resource movement and spending. The resource movement effect is either the withdrawal of the labor force from the lagging tradable sectors into booming sectors (direct de-industrialization) or the luring the labor force out of lagging sectors into non-tradable sectors (indirect de-industrialization). Generally, rapid economic growth based on favorable factor prices runs current account surpluses and as the result of it, government expenditures rise towards the economy attracting labor force out of the lagging sectors into the non-

tradable sectors creating the real appreciation of the national currency (increased price levels).

The presence of Dutch disease in Azerbaijan is elusive in nature. Early concerns held that the institutionally underdeveloped country would experience the phenomenon in the middle and long-term due to a lack of necessary management incentives and revenue mismanagement (Laurila, 1999; Mahnovski, 2003; Kaser, 2003). High dependency on mineral exports and international prices, as well as the polarization of FDIs into the extractive industries triggered an occurrence of Dutch disease (Auty, 2001; Lee, 2005). In fact, Azerbaijan has been considered under the “resource curse” by Gojayev (2010); however, early empirical investigations by Gahramamov and Fan (2002) concluded otherwise². Studies by Hasanov (2010), Hasanov (2011), Hasanov and Hasanli (2011), and Hasanov (2013) conceptualize the effects of Dutch disease, focusing mainly on real effective exchange rate (REER) and inflationary effects and identify a strong relationship between booming and appreciation trends. In contrast, studies by Bayramov and Conway (2010); Şanlısoy and Ekinici (2019) and Égert (2012) do not find evidence of the Dutch disease phenomenon in Azerbaijan.

The current state of the examination of the Dutch disease symptoms in the Azerbaijan economy is quite ambiguous and focuses only on highly available and aggregate variables like oil GDP, non-oil GDP, oil prices, and employment. While the studies from Laurila (1999), Mahnovski (2003), and Kaser (2003) were concerned with the political economy aspects, Hasanov (2013), Niftiyev (2020) conducted a descriptive evaluation. The employed variables are usually in the form of year-on-year growth, as a percentage share of total or in raw time series. This points to the research gap which can be filled by cumulative variables and new indicators obtained from the organization like SOFAZ (State Oil Fund of the Republic of Azerbaijan). Furthermore, this paper argues about the possible trajectories of the Dutch disease syndrome in a more comparative and critical manner by reconciling the macroeconomic variables of interest in the context of economic policy.

² However, it should be noted that the oil boom was ahead during the research years. In 2002, the adopted methodology was not sufficiently comprehensive to diagnose Dutch disease based on the possible monetary pressure that huge mineral revenue generally brings into the economy.

In this study, the economic performance of Azerbaijan between 1991 and 2018 is analyzed against a background of the Dutch disease model to answer the following research question: did the economy of Azerbaijan experience the main symptoms of Dutch disease, such as REER appreciation alongside the appreciation of real wages, increased role of services and industrial slowdown, as the model originally proposed by Corden and Neary dictates (Corden and Neary, 1982; Corden, 1984)? The paper evaluates new target variables like real wages and employment changes in cumulative growth terms. In comparison to the previously done studies by Gahramanov and Fan (2002), Hasanov (2013), and other similar studies, cumulative growth rates in relation to the main macroeconomic indicators provide better visualization of the dynamics that explain Dutch disease signs. A distinctive characteristic of this paper stands on its comprehensive and systematic descriptive evaluation of the Dutch disease phenomenon in Azerbaijan which also makes the research findings and policy recommendations widely usable and highly functional. The policy recommendations that support the analysis provides the necessary conceptualization of Dutch disease syndrome during the highly cyclical global world economy. This study contributes to the body of literature related to the Azerbaijan economy by directly investigating the Dutch disease symptoms vis-à-vis the macroeconomic dynamics of the country.

The next section of this study reviews the main literature examples related to Dutch disease and its presence on other post-soviet economies, as well as in Azerbaijan. The second section describes the data via the summary statistics and informs about the constructed variables of interest. The third section outlines the recent trends in the economy of Azerbaijan, mainly during the transition period. The polarized economic structure and its sensitivity to sudden changes in commodity markets, as in 2014–2015, are described to conceptualize the Azerbaijani economy in the context of the booming and lagging sectors. Then, the fourth section of this paper evaluates the Dutch disease symptoms, similar to Dobrynskaya and Turkisch's (2010) examination of Dutch disease in Russia's case, focusing on criteria like the exchange rate, real wages, increased role of services, and industrial slowdown. Lastly, policy recommendations based on the brief evaluation of other countries' experiences shed light on both applied activities and gaps in the context of the Dutch disease

phenomenon in Azerbaijan and the paper concludes with the limitations of the study.

2. Literature Review

2.1. The Presence of Dutch Disease in Post-Soviet Economies

Several resource-rich countries of the world economy like Australia (Corden 2012), Nigeria (Otaha 2012), Indonesia (Pangestu 1990), Mexico (Auty 1991), Colombia (Kamas 1986), Norway (Larsen, 2006), and the United Kingdom (Hutchison 1994) have been considered as “Dutch disease-infected” because of the common characteristics like having a booming sector, undiversified economy (having various lagging sectors), contracted manufacturing due to the dominant sectors and real exchange rate appreciation. Among them, the post-soviet resource-rich countries play a significant role. Despite rapid economic catch-up and modernization since independence, scholars and policymakers still are not sure about the sustainable long-term growth that Dutch disease syndrome endangers among ex-soviet economies. Furthermore, even the precise diagnosis of the Dutch disease effects is highly challenging because of data problems, the pass-through of oil prices to the nominal and real effective exchange rates are highly visible (Égert, 2009). Thus, there is a chief rationale to argue about Dutch disease syndrome among the oil-rich post-soviet countries.

The biggest mineral exporter among post-soviet countries is Russia. Mironov and Petronevich (2015) defended the thesis that Russia has Dutch disease signs because a 1% increase in oil exports had led to the real exchange rate appreciation by 0.2%. The authors argued that the real exchange rate is the main channel for Dutch disease and also mining sector’s output and profitability sky-rocketed, alongside the increased role of services which point to the partial spending effect of Dutch disease. Similar findings come from Algieri (2011) who by applying the VECM framework documented the three cardinal signs of Dutch disease: exchange rate appreciation, oil-led GDP growth, and contracted ratio of manufacturing output over services output. However, Dobrynskaya and Turkisch (2010) argued that despite there was a strong real appreciation in the Russian ruble, real wage increase, manufacturing decrease in employment, and rise in services employment, de-industrialization did not happen. On the contrary, Russia’s case shows increased industrial

production and productivity upheavals. Koomes and Kalcheva's (2007) found similar outcomes like Dobrynskaya and Turkisch (2010).

The other countries that were intensively considered within the Dutch disease hypothesis were Kazakhstan, Uzbekistan, and Ukraine. It is not a secret that the Kazakhstan economy is also highly oil and gas dominated. Kutan and Wyzan (2005) investigated the possibilities of the Dutch disease effects in the Kazakhstan economy and evaluated it as vulnerable to it in the long-term rather than having it during the investigation period. The other research from Égert and Leonard (2008) concluded that because of the absence of the connection between real exchange rate and non-oil manufacturing open sectors in Kazakhstan, oil prices hikes do not negatively influence non-oil exports. The work from Kuralbayeva et al. (2001) approximated the same results and evaluations of the above-mentioned literature examples.

Similarly, having higher productivity and profitability in natural gas and fuel sectors put Uzbekistan's foreign investments in a highly concentrated form in oil tradable sectors expecting certain signs of Dutch disease (Barry, 2009). Lastly, in the case of Ukraine, there are very few studies but the strong emphasis is based on the weak manufacturing sectors that lagged for a long time, without catching up with the pre-soviet levels of production and exports (Bezrukova and Svichkar, 2014).

2.2. Dutch Disease Studies about Azerbaijan Economy

Early studies regarded the actuality of Dutch disease in Azerbaijan was based on the rationalizations from the international experiences of the other resource-rich countries and theory when a booming sector takes over the national economy. Singh and Lauria (1999) pointed to the fact that in the short-term real exchange rate appreciation is not a danger; however in the medium- and long-term it poses serious risks. In the other paper Lauria (1999) strongly mentioned that any delay in the structural reforms and economic mismanagement might harm the economy Azerbaijan. The point of departure of Mahnovski (2003) and Kaser (2003) regarded Dutch disease syndrome in Azerbaijan was the examination of the political regimes and economic diversification level of the Caspian basin countries. They argued that the big role of the state in the economy, the nature of the political regimes, and low level and lack of attention on

the non-oil industrial products sooner or later will bring Dutch disease into the economy.

Then, as the statistical data were collected and the possibility of methodological examinations expanded, new studies examined Dutch disease effects in the Azerbaijan economy. The most fundamental study was from Hasanov (2013). The study concluded that public expenditures exhibited positive and long-run relationships with non-oil GDP which signifies the relevance of spending effect compared to the resource movement effect. Moreover, oil prices had a statistically significant effect on a real appreciation of the exchange rate, and the rise of real wages was due to the spending effect of Dutch disease rather than productivity growth. But earlier, Gahramanov and Fan (2002) concluded that Dutch disease is absent in Azerbaijan because of the lack of monetary evidence of its existence. However, the studies related to the real effective exchange rate, inflation, non-oil exports, non-oil GDP by Huseynov (2009), Hasanov (2010), Hasanov and Samadova (2010), Hasanov (2011) revealed that the most important factor behind the inflation, real exchange rate appreciation, and lagging non-oil sectors is oil prices and the presence of Dutch disease effects.

The cyclicity of the Azerbaijan economy concerning oil prices is quite high (Niftiyev and Namazova, 2020). Various studies examined Dutch disease effects in line with the outcomes of the procyclical developments of the national economy that also sheds light on the presence of Dutch disease. For instance, Zulfugarov and Neuenkirch (2019) applying VAR (Vector Autoregressive Models) between 2002Q1-2018Q1 concluded that Dutch disease hypotheses in Azerbaijan are observable.

To address Dutch disease in the economy, Azerbaijan should fully continue to collect taxes (not solely relying on the royalties and oil sector taxes), to diversify the national economy, to fight dollarization, to increase savings, to strengthen state institutions, etc. (Mahmudov, 2002). Also, institutional regulations should be tightened to overcome Dutch disease-related de-industrialization (Niftiyev, 2020).

3. Data and Methods

This paper employs a descriptive graph analysis of the development of Dutch disease in the Azerbaijan economy. To do so, annual data from the

State Statistical Committee of the Republic of Azerbaijan (SSCRA), Central Bank of Azerbaijan Republic (CBAR), the SOFAZ, the World Bank (WB), the International Monetary Fund (IMF), and others, are used to outline trends in fiscal policy, employment, industrial production, real wages, and tertiary sectors. The sample contains oil and non-oil tradable sectors, as well as, mining, manufacturing, and services to compare and analyze the variables' trajectories. Oil tradable is the total of the mining industry and petroleum and fuel production. Non-oil tradable contains manufacturing activities in the economy which excludes oil or fuel related processes.

The paper heavily uses graph analysis to track the multiple trends alongside the time-series. Table 1 reports the summary statistics and the measurement level of the main variables of interest used throughout the paper. Different indicators cover different periods. That is why the data range and the data sources have been indicated in each figure.³

Table 1: Summary statistics of the main variables of interest

Variable name	Min.	Max.	Mean	St.Dev.	CoV
Employment in Agriculture, thousand persons	1509.40	1769.30	1626.43	78.81	0.048
Employment in Manufacturing, thousand persons	184.50	254.80	211.89	20.62	0.097
Employment in Mining thousand, persons	37.90	44.30	41.26	1.91	0.046
Employment in Services, thousand persons	1948.50	2746.30	2350.00	239.58	0.102
Exports, non-oil tradable sectors, % of total	2.50	34.20	12.81	8.43	0.658
Exports, oil tradable sectors, % of total	65.80	97.50	87.19	8.43	0.097
External debt, % of GDP	0.89	41.73	20.00	10.66	0.533
Variable name	Min.	Max.	Mean	St.Dev.	CoV
GDP growth rate, % change of annual real GDP	0.79	37.21	13.76	13.09	95.128
General government total expenditures, % of GDP	18.66	38.38	30.05	5.46	0.182
Government expenditure, % of GNI	18.66	38.38	30.04	5.61	0.187

³ Sample size or observation numbers can be easily obtained from the corresponding figures.

Non-oil manufacturing growth rate, in %, year-on-year	-49.80	24.60	-1.06	17.62	-16.689
Non-oil tradable, industrial production, % of total	0.11	0.83	0.31	0.21	0.670
Oil prices, BRENT trademark, USD per barrel	12.72	111.97	49.59	33.18	0.669
Oil REER/Non-oil REER, ratio	1.00	1.13	1.05	0.04	0.038
Oil tradable, industrial production, % of total	0.12	0.84	0.61	0.22	0.365
Overall manufacturing growth rate, %, year-on-year	-32.80	22.40	-1.61	12.40	-7.700
Real wages in Manufacturing, AZN	101.6	448.4	273.1	114.9	0.421
Real wages in mining, AZN	262.4	2120.4	1119.2	557.8	0.498
Real wages in Services, AZN	103.9	448.0	323.9	120.7	0.373
REER in non-oil sectors, in %. December 2000=100%	73.80	125.60	99.05	15.95	0.161
Share of SOFAZ transfers in the state budget, in %	7.30	58.20	36.41	19.66	0.540
SOFAZ's expenditure, million AZN	0.81	9223.53	3693.86	3107.24	0.841
SOFAZ's revenue, million AZN	221.90	15628.00	7064.97	5490.52	0.777
Total REER, in%. December 2000=100%	74.20	134.60	104.70	19.69	0.188

Note: CoV denotes "coefficient of variation"

4. Recent Trends in the Economy of Azerbaijan

Nuri Aras et al. (2016) describe the Azerbaijani economy during the Soviet Union as a time in which exporting raw materials was cheaper and importing ready products was expensive. The main exports during this period were oil, machine building, weaving, and wine products. The economy was a centrally planned command economy with an industrial production that catered to union-wide demands. Economic growth between 1960 and 1970 was 5.2%, compared to 7.4% in 1970–1980 (Nuri Aras et al., 2016). However, a severe decrease in GDP occurred from 1985 to 1991 (Cornel, 2015). The reason for the slowdown in economic growth was the gradual shift in oil and gas production from Azerbaijan to Siberia and Kazakhstan, leading to labor migration, a decrease in the extractive industry's output, and the withdrawal of investment that was originally channeled to oil and gas sources in Baku near the Caspian Sea (Laurila, 1999).

Azerbaijan underwent a transition period after independence from the Soviet Union. Nuri Aras et al. (2016) divide this period into three stages, which are summarized in Table 2.

Table 2: Main stages of the transition period after the collapse of the USSR in Azerbaijan

	Main developments	Reforms and decisions
<i>1st period after independence 1991–1994</i>	- Loss of the common market; - High unemployment and inflation; - Political instability; - War with Armenia and loss of 20% of territories; - Decrease in production; - Deficit in state budget and shortcomings from tax collections.	- Laws on Private Property, Foreign Directed Investments, and Execution-Bankruptcy were enacted; - Manat became the national currency; - Ceasefire with Armenia; - Trade liberalization and privatization.
<i>2nd period after independence 1995–2003</i>	- The contract of the century that attracted huge Foreign Directed Investments (FDI) on the oil and gas industry; - Agricultural lands were rapidly privatized and excluded from taxes (with the exception of land tax); - Infrastructural modernization.	- State Program on Poverty Reduction was adopted; - Various laws such as Land Reform and Public Procurement; - Tax code.
<i>3rd period after independence (from 2003)</i>	- The oil extraction, refinery, chemical industry, petrochemical and electricity industry gained big share in the economy; - Reconstruction of the energy sector via the privatization;	- The State Program on the Socio-Economic Development of Regions.

Source: Nuri Aras et al. (2016)

The most recent developments in the Azerbaijan economy are the decreased macroeconomic performance and certain economic policy responses of the government to the sharp downturn commodity prices that occurred between 2014 and 2015. The revenue of the SOFAZ fell to 7,721 million AZN in 2015, down from 11,227 million AZN in 2014. This influenced transfers from the sovereign wealth fund to the state budget. The share of the transfers was 50.7% in 2014; however, it fell to 43.5% and 37.1% in 2016 and 2017, respectively. Furthermore, during the oil revenue and output booming period (2008–2011), the average oil and gas

GDP was 21,139.05 million AZN in current prices; however, in 2015 it fell to 15,382.2 million AZN and in 2016, it increased its value to 19,552.6 million AZN. Similarly, during the booming period, savings were 49.4% of GDP, but this fell to 27.5% in 2015. Savings were their lowest value since 2002 in 2016 at 22.08%. Overall, industry value-added dropped to 18.01 billion USD, without considerable improvement until 2018, but it had peak shares of 32.01, 40.71, and 42.31 billion USD in 2008, 2011, and 2013, respectively. In October of 2014, the CBAR had 17.3 billion USD international reserves (the highest level since independence) but this fell to 4.03 billion USD in February 2016 as the devaluation process occurred twice in 2015. Finally, the downward trend in the shadow economy was replaced by an upward trend. The share of the shadow economy increased to 43.7% of GDP in 2015; however, it was 42.2% in 2014, the lowest indicator since the independence.

Policy responses to the macroeconomic performance of the economy covered activities like “Cancellation of the Inspections in Entrepreneurship” in 2015, the “Strategic Roadmap of the Azerbaijan Republic on National Economic Perspectives” in 2016, “Establishment of the Legal Entity of Public Law Center for Analysis of Economic Reforms and Communication” in 2016, “Financial Stability Committee” in 2016, “Additional Actions to Investment Promotions” in 2016, and “Additional Measures on Promotion of the Non-oil Products” in 2016 (Ministry of Justice, <http://www.e-qanun.az/>). These interventions aimed to address the current and future challenges brought about by decreased commodity prices. Thus, considering the dependency of the economy on the oil and gas industry, as well as the positive effect of the boom because of higher commodity prices in the international markets, the Dutch disease model can be used to evaluate the structural tendencies.

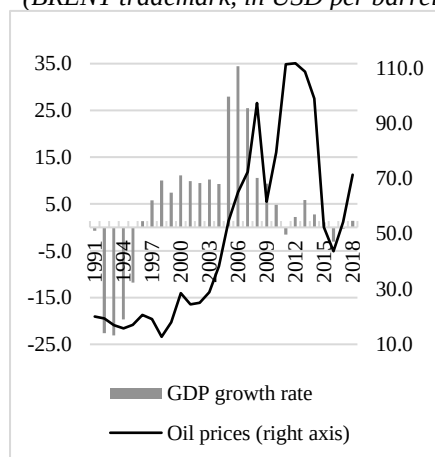
As the Dutch disease model is only applicable for open systems, it cannot be used to analyze the USSR period. Moreover, compared to the Netherlands, the country in which the model was first considered, Azerbaijan did not discover oil and gas resources after industrialization, so its economy was already based on the extractive industry with the necessary regulations from Moscow. However, the effects of Dutch disease since the independence, such as REER appreciation, the appreciation of real wages, increases in the tertiary sectors, and industrial slowdown as a result of the booming sector feeds into the original model. Thus, starting from the connection between the GDP growth rate and oil

prices and the structure of exports the relevant extension of the analysis might be able to argue about the presence of the thesis.

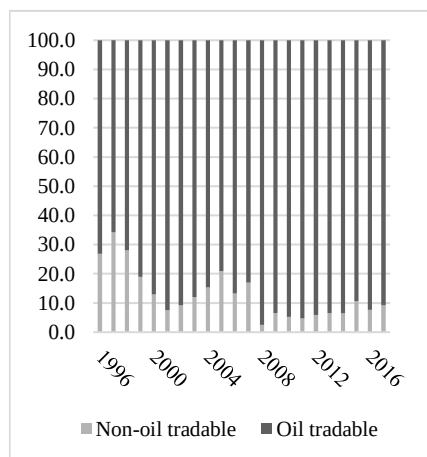
High oil prices in the world market have contributed to economic growth in Azerbaijan, as mineral products have increased the country's share in exports and oil prices have steered large amounts of foreign currency into the economy (Fig. 1 *a* and *b* panels). The GDP growth rate reached impressive levels on the edge of the oil boom, however also immediately responded to the global financial crises (2009) and the recent commodity price slowdowns (2014-2015) which allows to us to underline the strong positive correlation between these two crucial indicators. Dependence on mineral exports can be easily seen in the *b* panel in Figure 1. Starting from 2008, the oil tradable sector gained significant shares, mainly accounting for over 90%, which demonstrates the heavily influence of the oil sector on macroeconomic stability.

Figure 1: As the main source of economic growth, the connection between GDP growth rate and oil prices underscores the dependent nature of the economy of Azerbaijan.

a. GDP growth rate (in %) and oil prices (BRENT trademark, in USD per barrel)



b. Export structure, in %.



Source: World Bank national accounts data, OECD National Accounts data files, SSCRA, and author's own calculations.

5. Dutch Disease Symptoms

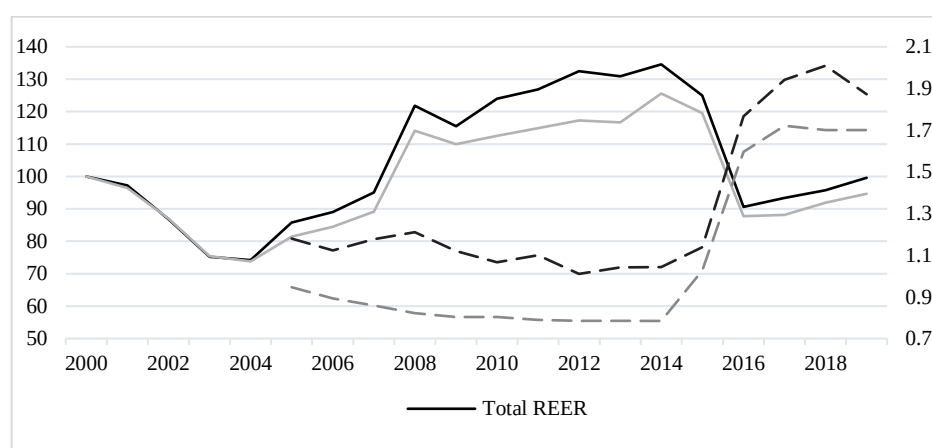
This section provides an evaluation of statistical data regarding the symptoms of Dutch disease, similar to the analysis by Dobrynskaya and

Turkisch (2010) of Dutch disease in the Russian economy, which was based on the original theory modeled by Corden and Neary (1982) and Corden (1984). Here, the REER, real wages, increased role of services, and industrial slowdown are evaluated as signs of Dutch disease based on the available data related to Azerbaijan.

5.1. Exchange Rate

Several studies have shown that oil prices strongly influence the value of the national currency in Azerbaijan (Huseynov, 2009; Hasanov, 2010; Hasanov and Samadova, 2010; Ağazade, 2018; Dikkaya and Doyar, 2017). In the Dutch disease model, the role of REER is highly important and has an impact on the competitiveness of the manufacturing sector. As they are so strongly linked with the value of the national currency, oil price slumps severely impact the economy. Hasanov (2011) shows the negative welfare cost of inflation arising from the booming sector. Similarly, a study by Hasanov and Hasanli (2011) conceptualizes the long-term irrelevance of the money market approach in Azerbaijan and points to the importance of resource dependence in terms of the value of the national currency. Figure 2 shows the appreciation of the national currency during and after the oil boom period (2008–2011) and the inevitable depreciation after the sharp downturn in commodity prices in 2014–2015. The AZN to USD and euro exchange rate increased as the oil price shock eroded the central bank's foreign exchange reserves. The CBAR adopted a fixed exchange rate policy to decrease the monetary risks associated with the huge inflow of foreign currency between 2005 and 2014. As there was low demand for foreign currency by households and firms, the main buyer was CBAR. Transnational Companies (TNCs) that were heavily involved in the oil industry also needed to convert foreign currencies to the local currency to pay taxes and royalties. A high supply of foreign currency coupled with low demand for it increased the reserves of CBAR. Therefore, the CBAR applied a fixed exchange rate regime in an attempt to appreciate the manat. Without this regime, the lagging sectors would have likely experienced an even more drastic collapse due to the overvalued national currency. Even though the years of 2014–2015 were the tipping point of the exchange rate in Azerbaijan, the CBAR continues to apply the fixed exchange rate regime, despite announcing a transition to floating regimes (Statement of the Central Bank of the Republic of Azerbaijan 2015a; 2015b).

Figure 2: The real effective exchange rate and exchange rate of the Azerbaijani manat (AZN) against the USD and euro.



Source: CBAR

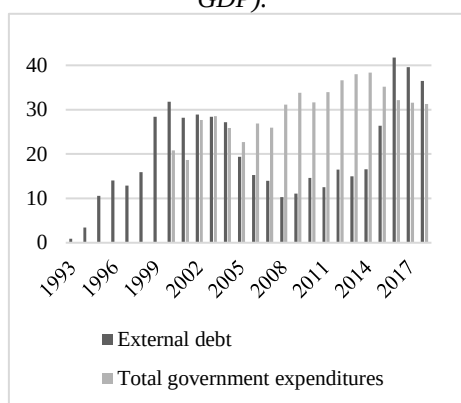
Note: Data for 2019 is based on the available months

During the period in which the national currency appreciated (mainly 2008–2014), government expenditure had higher share of GDP (between 31.1 % and 38.4%), though external debt was low (Fig. 3, panel *a*). The oil price slumps during 2014–2015 increased the external debt from 10% in 2008 to 41.7% in 2016. Moreover, considering the strong connection between REER and industrial output, the number of declining years for non-oil manufacturing sectors was 15 (1991–2017), while the number of declining years in mining was just 7 (Fig. 3, panel *b*), indicating the diminished production of the lagging sectors.

As factor prices have increased rapidly since the early 2000s, the oil sector has created a huge challenge in terms of the appreciation of the local currency, as can be seen from the index depicted in Figure 4. During the oil booming period, the coefficient of total REER over non-oil REER reached 1.13 after the balance levels of 1 and 1.01 between 2000 and 2004. Commodity price slumps then pushed down the appreciating power of the oil industry (which total REER includes) to 1.03 in 2015. The post-2015 period shows an upward increase in the favor of oil industries as well.

Figure 3: The main consequences of REER appreciation as the main channel of Dutch disease syndrome on external debt and on the growth of industrial output.

a. Changes in government expenditure (% of GNI) and external debt (% of GDP).



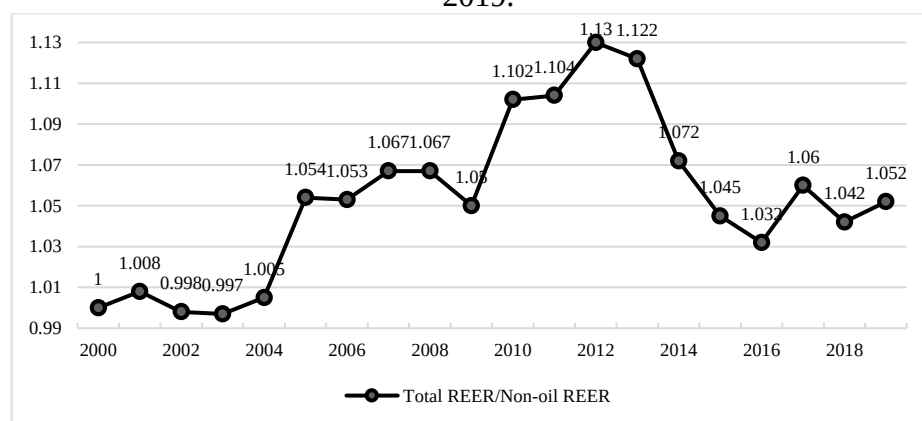
b. The frequency of the growth in industrial output between 1991–2018 in years.



Source: www.theglobaleconomy.com, World Bank, IMF - World Economic Outlook Database, SSCRA.

Another challenge for exchange rate stability and predictability is the major share of the informal economy, as discussed by Ahmadov (2016). The higher the share of the informal economy, the higher the probability of tax evasion and untracked household real income and transactions. Consequently, the informal economy is hugely problematic in terms of economic policy, particularly in the context of an undiversified and Dutch disease-experiencing economy. The first symptom of Dutch disease in Azerbaijan is in the trends corresponding to the considerations of the broad literature.

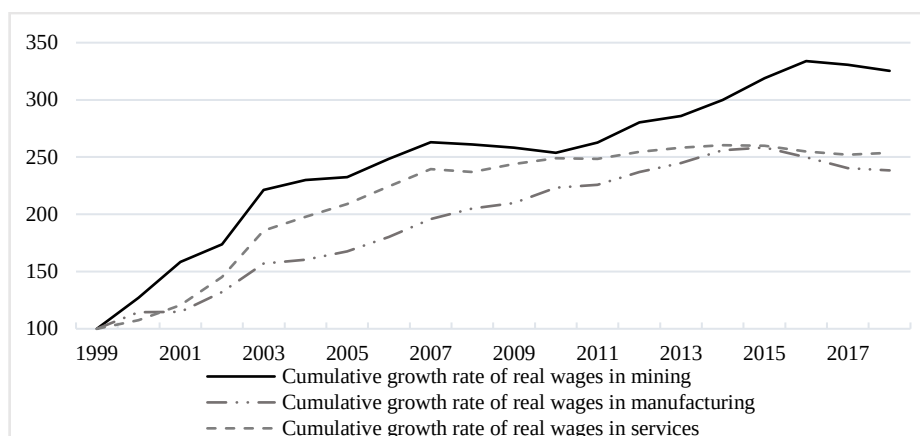
Figure 4: The ratio of total REER over REER in non-oil sectors, 2000–2019.



Source: CBAR, author's calculations.

5.2. Real Wage Trends

The second symptom of Dutch disease is the appreciation of real wages in the booming sector with increased employment (resource movement effect) resulting from the attractive status of the booming sectors. In addition, if the spending effect of Dutch disease is more powerful, the real wages in services can outperform others. Can these trends be seen in the economy of Azerbaijan? As Figure 5 shows, in cumulative growth terms, real wages had their highest appreciation in the mining sector, outperforming services in 2017 almost three-fold compared to 1999. Manufacturing was the worst performing of the three sectors, despite having an upward trend until 2015. As the economy of Azerbaijan is heavily dependent on oil revenues, the tertiary sectors have long been nourished by government expenditures, slightly losing their upward trend as the high oil price era ended in 2014–2015. Mining and manufacturing began to slow after this period. Overall, the cumulative growth rate dynamics of real wages indicate the presence of the second sign of Dutch disease. However, empirical data on the employment dimensions of the theory should be also considered.

Figure: Real wage trends in %, 1999=100%, 1999–2018

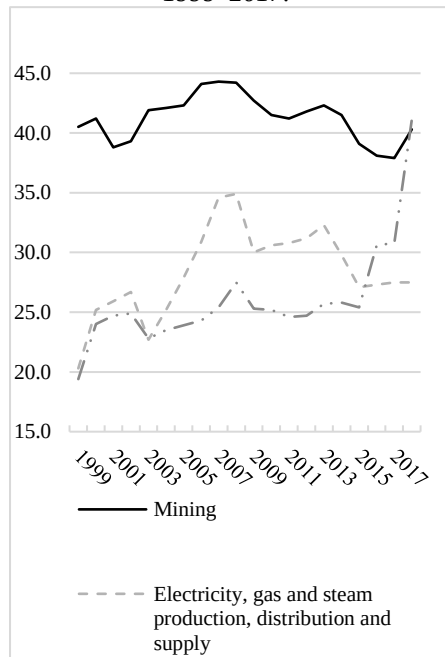
Source: SSCRA, Author's own calculations.

Note: Real wages have been calculated based on CPI-adjusted nominal wages.

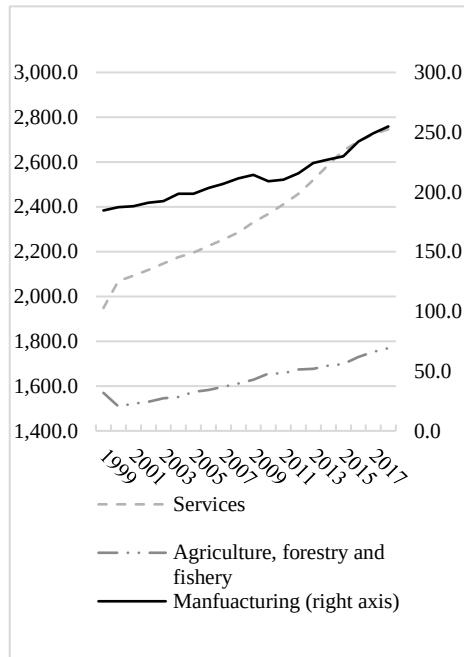
The resource movement effect states that the booming sectors should attract the labor force from the non-booming sectors due to increased marginal product. However, Figure 6, panel *a* shows a decreasing trend in mining employment, pointing to a decreased demand for labor in the mining sectors as the main oil and gas extraction projects were finalized. Other closely associated sectors, such as electricity, gas and steam production, started to employ fewer workers; however, water supply and waste treatment and disposal increased its share twofold between 1999 and 2018. Panel *b* in Figure 6 shows that manufacturing increased its share of the employed labor force from 184.5 to 254.8 thousand people. This is not a noteworthy increase among manufacturing sectors, but still contradicts the resource movement effect of Dutch disease. Services gained an upward trend in the employment and obviously it can be the illumination of the indirect de-industrialization as Corden (1984) documents being the result of spending effect which is the withdrawal of the labour resources from booming sectors and lagging sectors into the non-tradable sectors. Thus, employment data does not support the second symptom while real wages in cumulative terms are compatible with the model.

Figure 6: Distribution of employment in natural value across various sectors.

a. Employment in mining and closely related sectors in thousand persons, 1999–2017.



b. Employment in services, agriculture and manufacturing in thousand persons, 1999–2017.



Source: SSCRA, Author's own calculations.

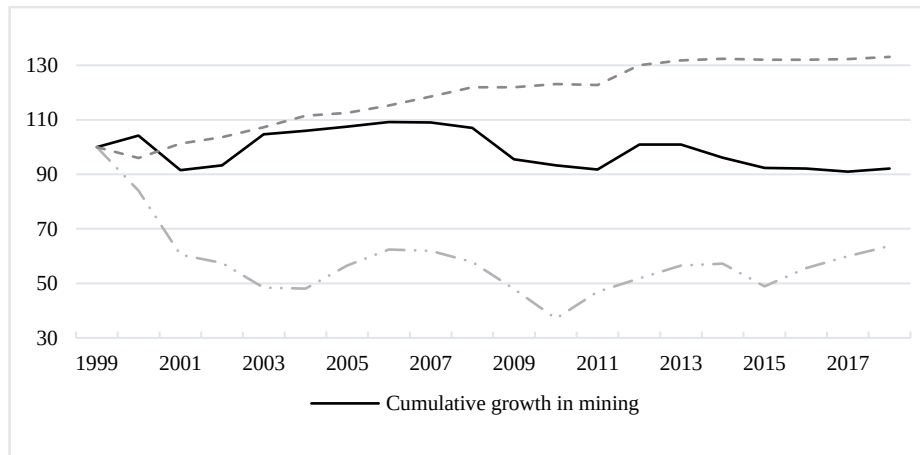
5.3. Increased Role of The Services

The increased role of services is closely related to revenue from the oil boom. Governments of mineral-rich countries or resource owners tend to spend more when favorable oil prices attract huge revenues from international commodity markets. By itself, spending on infrastructure and social projects is not bad in nature; however, without the development of the non-resource tradable sectors, fiscal expansion can harm economic growth in the long-term (Corden and Neary, 1982). Subsequently, compared to the experience of developed countries, in mineral-rich countries, tertiary sectors grow because of mineral exports rather than because of solid industrialization. However, not every mineral-rich country experiences this kind of trend. In fact, as Dobrynskaia and Turkisch (2010) argue, the increased role of services in Russia is a direct consequence of the rapid development of services starting from the mid 1990s, which were underdeveloped during the Soviet period. The authors

note that the elevated employment in services resulted from the increase in the productivity of manufacturing technology that decreased the labor demand and escalated labor force's preference to work in it because of its prestigious status. Therefore, in Russia, the increase in services is not consistent with export revenues, as stipulated in the Dutch disease model.

In Azerbaijan, despite an appreciation of real wages in mining, employment in the booming sectors has not shown any significant upturn in cumulative growth terms (Fig. 7). The manufacturing sectors also have not experienced any major upheaval in employment, which experienced sequential falls particularly during the post-boom period, compared to minor developments during the pre-boom period. The only stable trend that can be observed in services is mainly upwards, indicating the spending effect of the phenomenon, rather than the resource movement effect.

The painful transition process and the government's emphasis on the extractive industry put major pressure on the labor force in the Azerbaijan economy. The role once manufacturing value-added possessed in the Soviet Union regarded labor force disappeared. Furthermore, due to the low employment opportunities in mining, the labor force headed towards services as the government also increased spending from capital accrued from mineral exports. Subsequently, the cumulative growth of employment in services had the most stable upward trend (Fig. 7). After big oil and gas extraction projects were finalized, the mining sector started to employ less. However, the most drastic structural recession in the labor market occurred in manufacturing from 1999 until 2010. The cumulative growth of manufacturing has had a slightly upward trend since 2010, but there has been no noticeable recovery from pre-boom era levels.

Figure 7: Employment trends in %, 1999=100, 1999–2018

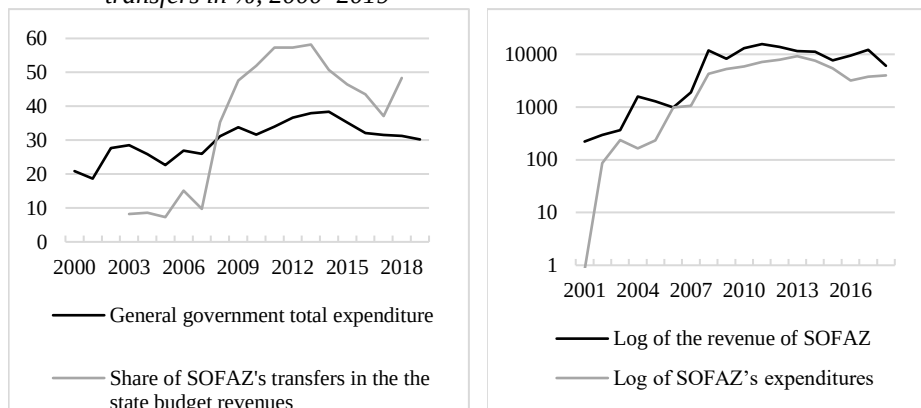
Source: SSCRA, Author's own calculations.

The *a* and *b* panels in Figure 8 show the increasing log of revenue of the SOFAZ and its share of the state budget, as well as the state's decision to spend more during the oil and gas boom. While the shares from the SOFAZ of the state budget increased noticeably, a slightly upward trend can be observed in overall government expenditure. These dynamics overlap with the increased share of services in the total employment, coinciding with the spending effect element of the theory, because the increased demand for labor in services was met with an oversupply of the labor force that was crowded out for a while from the manufacturing or any similar lagging sector. Hasanov et al. (2019) document the statistically significant relationship between the non-tradable sectors and government expenditure and observe that the non-oil tradable sectors benefited less from government spending than the non-tradable sectors, and benefited mainly from infrastructure investment over any other expenditure category. Consequently, as Aliyev and Gasimov (2018) stress, after the downturn in commodity prices, the stable expansionary fiscal policies that the government applied during the oil boom period were replaced by contractionary policies, which undermined the development of the non-oil and the non-tradable sectors and created new challenges for the economy.

Public services also rose following higher state financing. In 2007, the Public Service Index provided by the Fund for Peace was 6, but it has fallen to 4.8 in 2019 at a stable pace over an 11 year timescale, indicating the increased share of public services ([Fragile States Index](#))⁴.

Figure 8: Expenditure patterns and its source from the perspective of the mineral revenue coming from the SOFAZ.

a. General government total expenditures, % of GDP, 2000–2018 and share of SOFAZ transfers in %, 2000–2019 *b. Log of the revenue and expenditures of SOFAZ, in million AZN, 2001–2018*



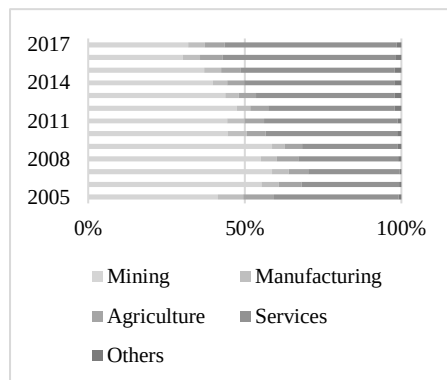
Source: Author's own calculations based on the reports of the State Oil Fund of the Republic of Azerbaijan.

Finally, the decomposition of the real GDP reveals the increased role of services in the economy of Azerbaijan (Fig. 9, panel *a*) alongside the high shares of SOFAZ in the state budget, despite the very small increases or even negative growth in exports of mineral products (Fig. 7, panel *b*). It is also worth mentioning that compared to countries like Canada and the Netherlands, in Azerbaijan, the incongruousness of the resource movement effect means that the source of the spending effect is not the income of households in the booming sectors, but is in fact government expenditure. Thus, the increased role of services is clearly observable as the third symptom of Dutch disease.

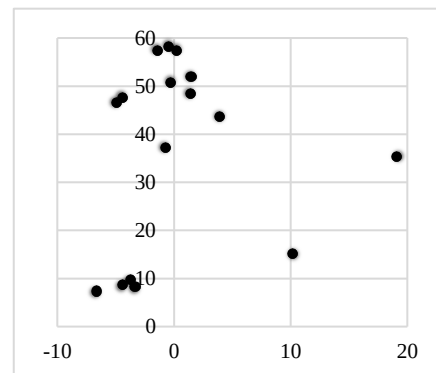
⁴ Lower indicator means a higher share of public services.

Figure 9: The increased role of services in the real GDP and its main source as increased shares of SOFAZ in the state budget.

a. Decomposition of real GDP value-added, chain-linking method in %.



b. Change in the exports of the mineral products (X-axis), in %, Share of the transfers from SOFAZ in the state budget (Y-axis) in %, 2003–2018.



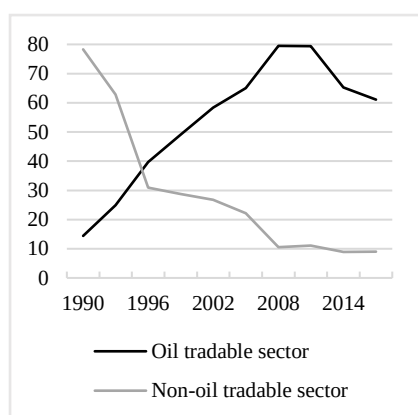
Source: SSCRA, Annual Reports of State Oil Fund of the Republic of Azerbaijan, author's own calculations.

5.4. Slowdown of Industrial Production

When it comes to the composition of production activities, the available data indicate that the oil tradable sector gained a major share, while the non-oil sectors in the economy of Azerbaijan show the opposite trend since independence (panel *a* of Fig. 10). The striking feature of the dispersion of the industrial structure is that the slowdown of non-oil industrial production occurred while the extractive industries and petroleum or fuel production leveraged their share up to 80% in 2008–2011 (the oil boom period). A considerable proportion of the growth of non-oil tradables only occurred in recent years (2014–2017) (Fig. 10, panel *b*). However, it is also necessary to consider the effect of devaluation of the national currency on the value of production, as a depreciated national currency stimulates an increase in industrial production and exports due to the increase in the price competitiveness.

Figure 10: Share of the sectors in the industrial products and year on year growth rate dynamics.

a. Oil and non-oil tradable sectors, % of total industrial products, selected years between 1990–2017.



b. The average growth rate of the selected periods of overall manufacturing and non-oil manufacturing between 1991–2017, in %.

Periods	Overall manufacturing growth rate	Non-oil tradable manufacturing growth rate
1991-1996	-6.95	-19.36
1997-2002	-9.53	-13.93
2003-2008	-8.68	-13.32
2009-2013	0.16	0.78
2014-2017	6.5	9.38

Source: SSCRA, author's own calculations.

The slowdown of non-oil tradable sectors in the 1990s is understandable in post-soviet and transition countries. However, it is interesting that after overcoming several major challenges and applying numerous reforms, the non-oil tradable sector did not show any noticeable recovery during the huge influx in oil revenue in Azerbaijan. This was a problem for the government as the mineral tradable sectors had a very limited employment capacity. The average number employed in the mining sector was 36.96 thousand persons between 1998 and 2018. The increased role of services provided steady employment in the tertiary sectors; however, the non-oil manufacturing sectors had a greater opportunity to provide employment.

Other resource-rich countries have experienced similar slowdowns and have been examined based on the Dutch disease hypotheses. For example, based on the Vector Autoregression (VAR) model for the years 1993–2016, research from Taguchi and Ganzorig (2018) shows that the Mongolian economy experienced Dutch disease as the manufacturing sectors shrank while the mining sectors dominated.

In contrast to the previously discussed symptoms of Dutch disease, industrial slowdown within a Dutch disease framework differs from

country to country. Despite being resource-rich, Canada and Russia have not shown any collapse in manufacturing comparable to Azerbaijan. According to Mackdonald (2007), durable goods production rose by 4.8% while non-durable goods production fell by 3.4% during the high oil prices (2003–2006) in Canada. A similar study on Canadian case by Petrunia and Matteo (2016) argues that manufacturing is flat or growing at a low rate compared to G7 countries, so the presence of the Dutch disease cannot be directly observed. Similarly, Dobrynskaya and Turkisch (2010) clearly show that Russia exhibited a steady increase in its manufacturing output, without showing any major signs of Dutch disease. In addition, Shafiullah et. al (2019) reveal that Australia does not suffer from Dutch disease in all regions of the country. However, the abovementioned countries are large countries in terms of their geographical area and have strong economic potential. Small, transitional, and institutionally underdeveloped countries like Azerbaijan better fit the Dutch disease hypotheses and show all signs of it, including manufacturing slowdown. This is why de-industrialization in small oil exporting countries should be considered separately from big, developed countries.

6. Policy Recommendations

When it comes to policy design in booming economies general characteristics of resource exporting countries have to be considered as a starting point. Oil-exporting countries experience severe challenges during low oil prices. Ismail (2010) identifies four main patterns among them: (1) oil price shocks lower the output of non-oil sectors, (2) especially in countries where capital markets are more open to foreign investment. (3) The relative factor price of labor to capital and capital intensity rises due to windfall increases, and finally, (4) if the manufacturing sector is capital-intensive rather than labor-intensive, price volatility in the international commodity markets may have less of an effect. Thus, resource-rich developing countries with Dutch disease should adopt policies that minimize the damage of a boom followed by a bust. This supports the example of Azerbaijan, because a fall in oil prices and oil GDP decreased the output of the non-oil sectors that heavily depend on government subsidies and protection, while the same challenges were not seen in the mining sector, which is dominated by foreign investment. A lack of data on labor costs prevents us from concluding the third finding of Ismail (2010). However, based on the

historical patterns, manufacturing in Azerbaijan has for a long time been labor-intensive in nature rather than capital-intensive, and it is not wrong to assume that price volatility impacts non-oil sectors severely.

The end of the commodity super cycle that began in the early 2000s and ended toward the end of 2014 and beginning of 2015 shows the lack of preparedness of the monetary system in the Azerbaijan economy. Recent trends following the sharp commodity price slumps of 2014–2015 are summarized by Ahmadov (2016):

- a) The strengthening of financial security and predictability that achieved stability in the exchange markets, in addition to the establishment of a new entity named the Financial Market Control Chamber (in November 2019, this organization was closed down and its responsibilities transferred to the Central Bank).
- b) The liberalization of the economy and improvements to its entrepreneurship capabilities to reduce dependence on the extractive industry. The president signed several decrees to enforce non-oil exports alongside customs reforms and to ensure the simplification of grants of licensing and permits.
- c) Non-oil sector improvements based on the institutional arrangements—these measures mainly relate to the continuation of the privatization process that slowed during the oil boom period.

The question is what the government of Azerbaijan should do based on the successful and failed examples of countries that have fought Dutch disease. A study by Usui (1997) shows the difference in the approaches of Mexico and Indonesia to overcoming the effects of Dutch disease. For example, as the fourth symptom examined in this study, a slowdown in manufacturing did not occur to a great extent in Indonesia, while Mexico was not able to avoid this. The share of the public sector rose in Mexico, as did heavy investment in the oil sector, without any policies directed toward the tradable sectors. The case of Mexico is reminiscent of the economy of Azerbaijan and the challenges faced by the non-oil manufacturing sectors. However, as Usui (1997) documents, agriculture and related activities were heavily subsidized by the Indonesian government to use oil revenue more efficiently to defend this sector from “lagging” status. Moreover, the case of Indonesia supports policy instruments like the devaluation of 1978 and the running of budget surpluses to successfully overcome Dutch disease, because currency

devaluation and budget surpluses were able to reverse real exchange rate appreciation and increase the output of the tradable sectors (Usui 1996).

Gurbanov and Merkel (2009) discuss the example of Norway, where successful policies minimized Dutch disease effects, leading to better economic structures. Norway neutralized the resource movement effect of the Dutch disease via the formation of a highly centralized wage system and income coordination that prevented low real wages in the manufacturing sector. Subsequently, through fiscal discipline, the Norwegian government spent resource revenues abroad rather than injecting them directly into the economy, which allowed for an escape from chronic real exchange rate appreciation, as well as increased price levels in non-tradable sectors. All these examples indicate that Dutch disease can be overcome or decreased through well-designed policies.

In Azerbaijan, as Hasanov et al. (2019) note, expansionary fiscal policy was replaced by contractionary policy in 2015, which negatively influenced the non-oil tradable sectors. Government spending must be made more efficient, and investment should be made in non-oil sectors to improve their competitiveness. Hasanov et al. (2019) argue that the labor force shifted to non-oil tradable sectors from other sectors following heavy investments. This indicates that if the necessary amount of attention is dedicated to the non-oil tradable sectors, human capital can be attracted to reinforce production and innovation.

Among the important policy considerations for avoiding Dutch disease are monetary regulations that can stabilize exchange rate fluctuations. Hasanov and Samadova (2010) state that exchange rate appreciation prevents the exports of non-oil sectors, discouraging the production of the value-added in Azerbaijan. The devaluation of the national currency in 2015 and the CBAR's announcement that AZN was under the floating exchange rate regime (Statement of the Central Bank of the Republic of Azerbaijan 2015a; 2015b) cannot be proven empirically (Fig. 2). This is why the Strategic Roadmap of Azerbaijan adopts "the transition to the fully floating regime" of AZN until 2020, which serves to fulfill priority number 1.3—the application of efficient monetary policy under a new economic model (the Strategic Roadmap of Azerbaijan). Some experts argue that the floating exchange rate regime is an important step toward sustainable development, while the others highlight the serious risks associated with a heavy dependency on mineral exports (ARB24). Similar

events have also occurred in Russia and Kazakhstan—other post-soviet resource-rich countries that are heavily dependent on mineral exports, but which have not experienced Dutch disease as severely as Azerbaijan thanks to the greater diversification of their economies. Mironov (2015) argues that devaluation alone is not a solution to every challenge souring from Dutch disease signs and in Russia's case, he argues, it does not mean that the economic recession because of the recent decrease in commodity prices cannot be considered defeated. It has been argued that the lack of a floating exchange rate regime distorts prices, creating a welfare cost (ARB24). The lack of a comprehensive monetary policy framework to regulate the exchange rate signs of Dutch disease represents a major obstacle in overcoming this phenomenon in the Azerbaijan economy.

7. Conclusion and Limitations

This study aimed to outline the main symptoms of Dutch disease in the context of Azerbaijan since independence based on the original theory modelled by Corden and Neary (1982) and Corden (1984). The main intention was to answer the following research question via the statistical analysis of the collected annual data from various sources like SSCRA, the SOFAZ, the WB and etc.: did the economy of Azerbaijan experience the main signs of Dutch disease, such as REER appreciation alongside the appreciation of real wages, increased role of services and industrial slowdown between 1991 – 1998?

The main findings indicate the fact that there is a high dependency on mineral exports meaning the economy of Azerbaijan has high growth rates during favorable commodity prices, but decreased macroeconomic performance after a super cycle ends. The oil boom period brought huge amounts of foreign currency into the economy, appreciating the local currency, decreasing the competitiveness of the manufacturing sector, and increasing the tertiary sectors resulting from government expenditure, all of which point to the first sign of Dutch disease. The second sign of the model is also apparent in Azerbaijan, because real wages appreciated in mining, while the performance of manufacturing as a lagging sector suffered. Even if in year on year terms, employment in the manufacturing and agriculture sectors did not fall, in cumulative terms, the worst performer was the manufacturing sector, while services have increased their role (the third sign). This is mainly due to increased and unregulated government expenditure from transfers from the SOFAZ. The last sign

that was clarified by this study is decreased and unrecovered non-oil production. Interestingly, despite having had a moderately an upward trend in the overall industry (in year on year terms), the non-oil sectors have not caught up with pre-2000 indicators in terms of industrial products.

However, several potential limitations of this study should be mentioned too. Generally, Dutch disease studies provide more insightful knowledge when a model approach is adopted to describe the crucial casualty between explanatory variables and dependent variables. Excessive reliance on the descriptive analysis narrows down the precise diagnosis of Dutch disease in Azerbaijan but still using cumulative growth rates and contrasting year on year term indicators in this research allowed to have a comparative perspective in line with the main trends of the economy. Some time-series tools like VAR (Vector Autoregression), SVAR (Structural Autoregression), or VECM (Vector Error Correction) models might be insightful to test the long-term casual relationship among the variables of interest. Then, further studies of Dutch disease symptoms in Azerbaijan should address the subsectoral scope of the phenomenon regarded agriculture and manufacturing to outline the consequences at the individual level. Aggregated sectoral data might be biased because a decrease in one manufacturing sector may be crowded out by an increase from other subsector and vice versa. At the same time, it is very important to separate the transition effect, political reasons and global financial crises, otherwise, it is difficult to clarify Dutch disease effects from other macroeconomic trends.

Policymakers and decision-makers should acknowledge the presence of Dutch disease creating the necessary incentives to construct proper measurement tools to measure it in a better way. The data and the statistical analysis show that the economy of Azerbaijan sounds with the original model exhibiting several overlapping symptoms of the phenomenon. However, further research should employ such indicators as return on capital in different sectors of the economy and unit labor costs in specific sectors in Azerbaijan which currently are not comprehensively provided by officials. Upcoming Dutch disease research should also incorporate institutional aspects, as well as human capital and political economy challenges to have more complete picture of the syndrome.

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Small Fish, Big Pond: Post-Brexit Challenges and Opportunities for Small Economy Trade Policies

Paul Pounder¹ and Alexander Wollenberg²

ABSTRACT

This research purposefully examines the existing literature on trading blocks, and reviews the trade balances between CARICOM, UK and the EU with a view of determining likeness of a Post-Brexit era and policy framework for CARICOM. The methodology entails a review of Brexit developments; discusses the likely consequences of a Brexit on CARICOM countries using quantitative economic analysis of longitudinal trade data incorporating a summary of several views held by scholars, statutory boards and expert opinions; and finally, the research identifies steps towards the development of a policy framework. The main findings highlight that the impact on CARICOM following a post-Brexit will be substantial owing to its large share of EU-bound trade being with the UK. Post-Brexit, the UK is likely to lose its advantage regarding customs duties, however, some of the impact will be cushioned as re-exports will be channeled to the EU bypassing the UK.

ملخص

يدرس هذا البحث الأدبيات القائمة التي تتناول مسألة التكتلات التجارية، ويستعرض التوازنات التجارية بين الجماعة الكاريبية والمملكة المتحدة والاتحاد الأوروبي بهدف تحديد الصورة العامة لفترة ما بعد خروج بريطانيا من الاتحاد الأوروبي وإطار السياسات الخاص بالجماعة الكاريبية. وتستلزم المنهجية مراجعة التطورات المتعلقة بخروج بريطانيا من الاتحاد الأوروبي، وتناقش العواقب المحتملة لخروج بريطانيا من الاتحاد الأوروبي على دول الجماعة الكاريبية، من خلال التحليل الاقتصادي الكمي للبيانات الطولية للتجارة التي تتضمن ملخصاً لعدد من آراء المتخصصين والمجالس التشريعية والخبراء، وفي الأخير تحدد الدراسة البحثية عدداً من الخطوات بهدف تطوير إطار خاص بالسياسات. وتبرز أهم النتائج أن التأثير على الجماعة الكاريبية جراء خروج بريطانيا من الاتحاد الأوروبي سيكون جلياً بسبب حصتها الكبيرة من التجارة المرتبطة بالاتحاد الأوروبي كونها تابعة للمملكة المتحدة. وبعد خروج بريطانيا من الاتحاد الأوروبي، قد تفقد المملكة المتحدة المزايا المتعلقة

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بالرسوم الجمركية، لكن بعض الأثر سيخف مع مرور عمليات إعادة التصدير إلى الاتحاد الأوروبي عبر المملكة المتحدة.

ABSTRAITE

Cette recherche examine délibérément la littérature existante sur les blocs commerciaux, et passe en revue les balances commerciales entre la CARICOM, le Royaume-Uni et l'UE afin de déterminer la ressemblance d'une ère post-Brexit et d'un cadre politique pour la CARICOM. La méthodologie implique un examen des développements de Brexit ; elle examine les conséquences probables d'un Brexit sur les pays de la CARICOM en utilisant une analyse économique quantitative des données commerciales longitudinales incorporant un résumé de plusieurs points de vue tenus par des universitaires, des conseils statutaires et des avis d'experts ; et enfin, la recherche identifie les étapes vers le développement d'un cadre politique. Les principales conclusions soulignent que l'impact sur la CARICOM à la suite d'un accord post-Brexit sera substantiel en raison de la part importante des échanges commerciaux de l'UE avec le Royaume-Uni. Après la réforme, le Royaume-Uni va probablement perdre son avantage en matière de droits de douane, mais une partie de l'impact sera amortie car les réexportations seront canalisées vers l'UE en contournant le Royaume-Uni.

Keywords: Brexit, CARICOM, European Union, WTO, Gravity Models, Trade Policy

JEL Classification: F13, O11, O24

1. Introduction

Following the United Kingdom (UK) vote to leave the European Union (EU), the paper will discuss implications for small economies of the Caribbean Community (CARICOM) states on their trade relationship with the UK and the EU. Specifically looking at the impact on CARICOM in post-brexit era. Due to the advantageous position of CARICOM having concluded an Economic Partnership Agreement (EPA) with the EU, the paper focuses on trade post-Brexit. The sole intent of the paper is to discuss implications on CARICOM trade with UK and EU.

From the perspective of the UK being a part of the EU trading bloc or to remove itself, the authors consider the pros and cons of trading blocs. In the last two decades, the world has come to see the evolving of many existing trading blocs, especially as membership is changing. Chase (2005, 1), noted that “trading blocs have been dramatically expanding

throughout the world economy.” These trading blocs promote free trade agreements, customs unions, eliminate tariffs and other barriers to trade between the member countries; while leaving trade barriers with excluded countries. Research has shown that motives for trading blocs stem around economics (Viner 1950, 355), protectionism (Krugman 1991), “trade politics” (Krugman 1993, 61), and in more recent times “security externalities” (Gowa 1994, 41). While Levy (1993) argues that regional blocs neither promote nor hinder global trade. In general the characteristics of trading blocs have shown to be similar in economic structures, compatible laws and policies, and closeness in location to each other (Schott 1991; Thoumi 1989). These changes have led to much discussion by academics and practitioners as to the strengths and weaknesses of partnering with other countries to formulate trading blocs. Notably, economists have failed to rationalise trading blocs from a local perspective as they conflict with national wellbeing assumptions which are key to most trading simulations as mentioned by Trebilcock and Howse (2005). While liberals have recognized the positive political context of international trade. Lawrence (1996) states that groups of countries with similar political, institutional, and cultural backgrounds can achieve deeper integration than is feasible multilaterally. Further to this, much has also been said about legitimacy and consequences of trading blocs. Grieco (1988) alluded to the “relative gains argument” to assess the possibility of cooperation between trading partners.

The authors have noted that even though there is still no consensus of preferential trading blocs in the published literature; it is recognized that trading blocs allow for privileged treatment of its members over non-participating members. One sentimental view from Viner (1950) stated that based on the effects of the customs union, the protectionist is right and the free trader is wrong. Lawrence (1991) argues that blocs offer benefits like stimulating growth and enhancing the role of market forces. Further support for trading blocs is established by recognizing that tariffs to non-members and by negotiating as a combined grouping, there is potential to create better economic leverage, than was possible individually (Viner 1950).

The literature also looks at whether trading blocs have promoted trade among themselves while discriminating against other countries or at their expense. Lawrence (1991) expressed the concern that customs unions and free trade agreements would be “stumbling blocks” to multilateral

agreements. Trebilcock and Howse (2005) allude to trade diversions with regard to lower-cost producers who are part of the regional trading bloc and are discriminated against. Though it is thought that members within a bloc are closer and may be expected to trade more, due to lower cost structures related to transportation and supply chain management, this is not always the case. However, little is known about the degree of discrimination arising.

The following sections discuss in detail the key Brexit developments, the CARICOM-UK-EU trade relationship, as well as implications for CARICOM member states post-Brexit.

2. Brexit Developments and Their Significance for CARICOM as a Small Economy

We discuss the area of trade in greater detail as a focus point for this paper, with the CARICOM not wanting to make significant changes in principle to fulfilling its existing trade flows to either the UK or the EU.

In July 2018, the UK published a White Paper on the future relationship between the UK and the European Union post-Brexit in which the UK government outlined its positions regarding the aspects of the economic partnership, security partnership and further institutional arrangements. The highest priority has clearly been the economic partnership with the EU. In the Policy Paper, the UK proposed comprehensive frameworks including a free trade area focused on goods, which will be discussed in further detail in this section. According to the White Paper (2018), the UK proposes establishing a free trade area for goods, where the UK and the EU would maintain a common rulebook for frictionless trade at the border.

The proposal for the phase-in of the free trade area includes the introduction of a new version of a Facilitated Customs Agreement that represents a highly customized and unprecedented customs union. According to the White Paper (2018) it would “remove the need for customs checks and controls between the UK and the EU as if in a combined customs territory, while enabling the UK to control tariffs for its own trade with the rest of the world and ensure businesses pay the right tariff.”

There are several implications for CARICOM arising from the recent Policy Paper, which although initially met with criticism by the chief EU negotiator Michel Barnier, is likely to be adopted in a compromised amended version as the EU since has given further signals in the affirmative. For CARICOM, even a partial adoption of the terms of this Policy Paper would mean that goods could still enter the UK and once entered, be shipped onward to EU countries without further tariffs. With the UK's proposal, therefore, the only potential obstacle for CARICOM would be the UK itself and the speed at which the UK negotiates a new trade deal with CARICOM to replace the existing EU-CARICOM EPA. As a result, CARICOM should be prepared to trade with the UK on World Trade Organization (WTO) terms in the time following Brexit even with the Policy Paper being adopted as an official blueprint for UK-EU relations. Consequently, CARICOM businesses need to proactively start increasing trade links with the EU directly and not rely on the UK for a speedy renegotiation of the EPA with CARICOM (Bishop and Clegg, 2018). As a result, we believe the UK's recent Policy Paper does not change the current situation for CARICOM and its future relationship with the UK. CARICOM thus needs to continue its strategy of focusing on negotiating its future relationship with the UK and establishing new trade and supply chain links with the EU where CARICOM was too reliant on the UK in the past and take advantage of the EPA with the remaining EU-27 members (Bishop and Clegg, 2018).

3. Consequences of Trade (Desires and Losses)

It is recognized that international trade comes with its advantages and disadvantages. However, small island developing states like the ones within CARICOM have disproportionate dependence on international trade and because of their fragile environments are therefore more vulnerable to external shocks. The research has shown that trade creates opportunities for improving overall standing of a nation by spurring competition, increasing quality of life through consumption and improving efficiency within the economy. For instance, Widodo (2009) posits that comparative advantage derived from the efficiency of production can enhance the chances of international trade. With larger economies focussing on standardized and scale-intensive industries (Bastos and Cabral, 2007); while smaller developing countries specialize in standardized products (Bojnec, 2001). Additionally, Melitz (2003) highlighted that lowering barriers and advances in productivity from trade

liberalization may accrue disproportionately to the bigger businesses, thus weeding out smaller less productive local businesses. In more recent research, a paper by Arkolakis et. al. (2012) which reviews a series of heterogeneous and homogeneous trade models highlights that a country's domestic trade share and the elasticity of trade with respect to variable trade costs are adequate statistics for the aggregate gains from trade. Ossa (2015) and Sampson (2016) in conducting further research on trade disparities show that gains from trade can be magnified through differences across industries based on the trade elasticity and by trading in intermediate inputs. Other areas needing consideration that are more specific to CARICOM realities are the distance between trading countries and the number and frequency of practical routes. In addition, the Region has been plagued with many challenges and barriers in the maritime sector. Many problems created through inefficiencies in the maritime sector related to Port fees and inadequate supply of transport lines is the shipment of goods (cargo), transport costs, custom duties of importing countries and port security. Thus making a case for the development of a framework of standards to secure and facilitate global trade between CARICOM, UK and the EU; especially as there is intensification of global competition, and as the Region engages in collaborative and integrated activities to mitigate their inefficiencies (Pounder et. al, 2013).

4. Methodology

This research gives an understanding of the post-Brexit implications to CARICOM trade. The research involved three main stages. Firstly, the paper gives a review of Brexit developments, synthesizing and combining relevant data as highlighted by Grant et al. (2009). Secondly, the paper discusses the likely consequences of a Brexit on CARICOM countries using quantitative economic analysis of longitudinal trade data incorporating a summary of several views held by scholars, statutory boards and expert opinions as purported by Van Steen and Cooke (1989). Thirdly, the paper identifies steps towards the development of a policy framework as advocated by Walt and Gilson (1994).

5. Trade Analysis and impact

5.1. CARICOM's Trade with EU, UK

The following tables represent the value of trade in goods and services between CARICOM and the UK, and EU, respectively. It is worthy to note the high share of trade with the UK.

Table 1: Value of CARICOM Countries' Total Exports to the United Kingdom in USD: 2006-2015

CARICOM COUNTRIES	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
CARICOM	540,278,118	731,491,177	839,053,802	806,760,729	498,072,996	670,693,384	569,484,742	470,629,018	495,508,865	195,642,980
MDCs	457,855,817	620,212,923	738,868,410	675,968,560	397,965,143	592,351,648	478,142,472	362,431,480	380,213,815	105,226,861
BARBADOS	33,024,904	28,579,484	41,156,301	32,816,764	52,629,077	55,035,476	31,252,552	8,632,892	16,748,181	14,046,023
GUYANA	99,260,573	151,111,606	140,375,906	111,915,002	48,162,678	77,590,170	114,773,610	116,459,325	97,065,788	91,180,838
JAMAICA	204,667,370	215,994,448	222,793,776	129,649,487	83,925,772	111,617,286	45,086,396	81,769,904	75,903,629	-
SURINAME	-	-	-	-	-	-	-	-	-	-
TRINIDAD & TOBAGO	120,902,970	224,527,385	334,542,427	401,587,307	213,247,616	348,108,716	287,029,914	155,569,359	190,496,217	-
LDCs	82,422,301	111,278,254	100,185,392	130,792,169	100,107,853	78,341,736	91,342,270	108,197,538	115,295,050	90,416,119
BELIZE	44,309,996	47,990,040	58,082,265	79,578,499	71,187,695	66,514,313	78,403,842	86,337,273	89,802,250	81,896,961
OECs	38,112,305	63,288,214	42,103,127	51,213,670	28,920,158	11,827,423	12,938,428	21,860,265	25,492,800	8,519,158
ANTIGUA & BARBUDA	-	4,129,558	3,644,029	9,984,387	6,835,752	2,418,664	5,374,775	6,812,467	6,155,147	6,796,994
DOMINICA	7,653,000	5,186,708	5,325,858	3,841,949	2,676,412	461,791	340,065	405,294	-	-
GRENADA	228,162	298,479	504,223	572,234	250,516	110,330	309,156	471,653	1,479,124	693,709
MONTserrat	197,586	166,187	118,555	152,562	-	-	48,378	7,947	1,346	-
ST. KITTS & NEVIS	949,461	1,069,134	2,879,747	426,765	255,601	165,675	83,201	370,273	17,423	-
SAINT LUCIA	19,407,364	43,014,856	24,913,430	31,527,254	14,403,404	7,758,608	6,002,944	13,441,124	16,753,920	-
ST. VINCENT & GRENADINES	9,676,732	9,423,292	4,717,285	4,708,519	4,498,473	912,355	779,909	351,507	1,085,840	1,028,455

5.2. Total exports from CARICOM to the UK 2006-2015

From 2006 to 2008, there were increases of 35.4% and 14.7% respectively in CARICOM exports to the UK. In this pre-financial crisis period many CARICOM economies showed resilience in building trade with the diaspora, building capacity and developing export readiness initiatives. Many countries in the Region streamlined their objectives on increasing their focus on entering new geographic markets in the diaspora and developing new products. This strategy led to a growth pattern during this period as company strategies led to increased exports. However by 2010 decreases in trade dropped by 38.26%. This large drop can be linked to the failure of the free market as we know it. As the secondary credit market, investment banks and unregulated financial market disappeared. This created many challenges for CARICOM countries to export. Though supply of CARICOM products was available, the demand among UK consumers was down as disposable income was reduced among consumers. The relatively weak performance in trading was attributed to high business overall costs.

The period from 2010 to 2013 resulted in gradual fluctuations in trade figures. These fluctuations could have been attributed to the financial volatility, and client uncertainty in the market place. As CARICOM is made up of developing countries, this group is usually more exposed and sensitive to the effects of macroeconomic ups and downs. Therefore it can be stated that concomitant to the severe financial shock in the US and UK, is the trade collapse within the CARICOM region. The major factor explaining the decline in trade during the crisis period is the decline in demand. Reduction in tourism mainly, which is one of the biggest foreign exchange earners for the CARICOM. Post-crisis, the expectation is for growth to continue at pre-crisis rates, however, this is not exactly the case. The period 2014 to 2015 started to show signs of increased growth at 5.29%.

Notably, where there is a short fall off, the following periods had quick spikes. As the individual economies of CARICOM recovered, showing there is a representative bounce back in trade. Further, the increasing difficulty in obtaining trade finance post-crisis was viewed as the main contributing factor to explaining declines and fluctuations. The general consensus was that exporters were less willing to give importers products on credit. However, existing trade agreements have proved to be one of the best ways to open up foreign markets to CARICOM exporters and this is an area to be pursued with the UK.

Table 2: Value of CARICOM Countries' Total Imports to the United Kingdom in USD: 2006-2015

CARICOM COUNTRIES	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
CARICOM	588,330,845	671,197,720	613,806,815	511,251,769	474,497,441	495,998,185	520,092,894	590,711,868	591,288,582	205,040,271
MDCs	454,938,650	520,679,975	484,282,693	383,599,341	357,644,026	381,493,171	410,630,748	479,176,943	480,757,498	116,286,583
BARBADOS	94,939,984	101,407,109	92,521,025	67,181,358	64,194,426	71,638,385	66,342,615	71,624,249	69,531,706	68,197,528
GUYANA	42,475,961	61,398,630	51,114,358	41,754,262	58,832,912	62,093,013	48,873,303	45,784,584	48,708,726	40,194,817
JAMAICA	133,030,188	129,290,783	104,571,422	77,930,682	82,424,377	95,923,427	86,053,355	68,132,921	62,723,539	-
SURINAME	5,278,155	5,003,179	5,518,822	6,921,878	9,556,563	7,965,916	8,828,486	9,081,803	5,057,492	7,894,238
TRINIDAD & TOBAGO	179,214,362	223,580,274	230,557,066	189,811,161	142,635,748	143,872,430	200,532,989	284,553,386	294,736,035	-
LDCs	133,392,195	150,517,745	129,524,122	27,652,428	16,853,415	114,505,014	109,462,146	111,534,925	110,531,084	88,753,688
BELIZE	9,074,844	10,288,333	12,793,494	9,446,794	10,869,584	11,990,667	10,545,926	10,621,111	12,872,822	23,626,958
OECs	124,317,351	140,229,412	116,730,628	118,205,634	105,983,831	102,514,347	98,916,220	100,913,814	97,658,262	65,126,730
ANTIGUA & BARBUDA	23,149,560	36,807,370	13,515,520	28,180,467	23,068,323	16,642,991	20,646,861	14,176,886	16,830,903	18,868,042
DOMINICA	9,550,139	10,573,501	10,723,354	11,629,685	8,818,296	9,415,960	8,393,831	8,726,219	9,783,751	9,964,559
GRENADA	16,680,954	15,446,894	16,826,343	11,933,628	13,149,893	12,209,846	9,816,648	12,987,434	9,193,170	12,190,995
MONTserrat	1,524,748	1,980,080	1,818,281	1,677,451	1,067,332	1,590,868	1,611,383	1,606,388	1,660,512	-
ST. KITTS & NEVIS	13,152,675	11,060,437	14,555,859	13,018,095	7,412,193	10,113,077	9,997,277	7,041,052	7,773,868	-
SAINT LUCIA	40,806,344	37,255,448	37,150,158	30,528,191	31,504,715	33,293,010	29,585,684	28,991,445	28,709,672	-
ST. VINCENT & GRENADINES	19,452,931	27,105,682	22,141,113	21,238,117	20,963,079	19,248,595	18,864,536	27,384,390	23,706,386	24,103,134

5.3. Total Imports by CARICOM from the UK 2006-2015

The period 2006-2007 showed an increase in imports from the UK at a rate of 14%. The bulk of the imports into CARICOM remain to be fuel and lubricants, followed by food for final consumption. From 2007 to 2010 CARICOM imports from the UK showed a relentless decrease of 9%, 17%, and 7% respectively. The authors believe that imports were reduced in the 2007 to 2010 period as Governments sought to stabilize their Countries' balance of payments mainly through large reductions in consumption goods. From 2011 to 2013, showed a gradual increase 5%, 5% and 14% in trade imports to the CARICOM from the UK. Firms in the UK have been able to reposition to markets further afield and outside EU and this has helped boost overall export growth to the CARICOM Region. Noticeably, the CARICOM industries are struggling to compete against international competitors, especially as Governments remove tariffs to satisfy WTO regulations which may have discouraged consumption of imports and encourage consumption of domestic goods. The gradual increase of CARICOM imports from the UK is linked to the rejuvenation of UK's manufacturing base which is on the up and up.

5.4. Decrease in trade volumes with the UK following Brexit

Table 3 summarises the declines in trading volumes with the UK. For the first scenario, the UK is excluded from the EPA with the EU. It is unlikely that members of CARICOM and the UK would reach an alternative EPA-style agreement since the UK would be more inclined to re-negotiate bilaterals with larger trading partners first (Ebell and Warren 2016). The Commonwealth framework is not a substitute because it is not currently a trading framework that uniformly provides for tariff-free trade as does the EPA. The option of re-exporting CARICOM goods to the EU market would thus become unavailable. Currently, approximately 30% of UK exports to the EU are of non-EU origin. Only a customs union with the EU would solve this problem. However, the outcome is uncertain because neither Norway nor Switzerland are part of a customs union with the EU and therefore do not serve as precedents. The declines in re-exports of CARICOM goods to the EU (via the UK) export market shares would lead to declines in total trade of CARICOM members with the UK as shown in the table 3 below.

As the literature and datasets in this area are not conclusive on the impact of various free trade agreements on trade; we have observed some authors having made strong cases for both positive and negative impacts. Therefore, in addressing the issue of declining trade, we independently examined the impact of free trade agreements on goods and services and obtained estimates based on four of the most pertinent papers as addressed by Ebell and Warren (2016): Baier et al. (2008), van der Marel and Shepherd (2013), Ceglowski (2006), and Egger et al. (2011).

Table 3: Trade impact of leaving the EU on UK's total trade with CARICOM

	Declines in UK Export Market Share to EU		Declines in UK's Total Trade³ with CARICOM	
Scenario	Optimistic	Pessimistic	Optimistic	Pessimistic
WTO	50%	72%	20.7%	29.2%

Source: Ebell and Warren (2016)

5.5. Goods trade

In reference to a panel-data analysis on the goods and services trade within European Free Trade Association (EFTA) spanning 40 years (1960 to 2000) conducted by Baier et al. (2008), Ebell and Warren (2016) give an explanation. Ebell and Warren (2016) state that 1990 marked a turning point in which the value of the UK's trade in services with EFTA began to exceed the value of trade in goods and the share of services in the UK trade balance has grown since. Therefore, reaching an agreement for the UK that covers services trade is important. Unfortunately, the negative precedent here is Switzerland, which does not have passporting rights for its banks to trade in the EU. Passporting rights allow financial institutions in the UK and its overseas territory of Gibraltar full access to the EU without having to obtain any separate licenses or operating permits in other EU member states (Clegg, 2016). Non-EU members such as Switzerland do not enjoy passporting rights. In the UK and Gibraltar, banks and insurance companies have benefited immensely from this privileged access, giving them an edge over competitors such as

³ Declines in total trade are calculated as $(X_{\text{brexit}} - X_{\text{baseline}}) / X_{\text{baseline}}$

Switzerland (Clegg, 2016). Under a likely WTO scenario, Ebell and Warren (2016) compile findings by several authors with respect to the negative development of trade with the EU. Baier et al.'s (2008) model is based on ordinary least squares (OLS) and gravity modelling using trade data of bilateral trade in goods in areas with any level of trade agreement. The specific model is discussed in the following section in more detail and compared to other predictive methodologies.

Table 4: Trade Impact of Leaving the EU on UK Re-exports to EU Market Shares (declines)

	Goods	Services	Total			
Authors	Baier et al.	Vd Marel, Sheperd	Ceglowski	Baier et al. + v d Marel, Sheperd	Baier + Ceglowski	Egger et al.
WTO	53%	43%	63%	50%	56%	72%

Source: Ebell and Warren (2016)

5.6. Goods and services trade

Ebell and Warren (2016) argue that the most current and likely estimate is provided by Egger et al. (2011) who used a perspective of preferential trade agreements to arrive at their conclusion of 72% trade reduction with no post-Brexit deal. Their model is based on the broader concepts of preferential trade agreements (PTAs) rather than free trade agreements (FTAs) as PTAs call only for the reduction of tariffs between signatories rather than elimination as in FTAs. A PTA is therefore akin to (Most Favoured Nation) MFN status, which we would find under WTO rules. For this reason, the range of inputs used by Egger et al. (2011) covers a higher range of data points compared to using only FTA data, thereby resulting not only in a higher value of the dependent variable (trade decline) and but also a higher confidence interval.

Santos Silva and Tenreiro (2006) use a simplified method to approach this problem. They posit that under weak conditions, e.g. when the gravity model contains only the correct set of explanatory variables - the Poisson pseudo-maximal likelihood estimator provides close estimates of the original nonlinear model. Therefore, it is equivalent to a non-linear least squares model in the original equation. As it is a pseudo-maximum likelihood estimator, the data does not in fact have to be distributed as

Poisson. Although Poisson is appropriate as an estimator for counting data models, it is appropriate to apply; it is also possible to apply it more generally in nonlinear models such as gravity.

Furthermore, the Poisson estimator used by Egger et al. (2011) is realistic in that it includes all trade values including those that are zero. The frequency of a trade value of zero can be high because not all countries trade all goods with other countries. Therefore, in a Pseudo-Maximum Likelihood estimator model, values of zero can be automatically dropped from the OLS regression. The properties of Pseudo-Maximum Model estimators without the Poisson distribution can make the model prone to instability due to the presence of fixed effects. A Poisson estimator adds consistency even in the presence of fixed effects within OLS modelling. Therefore, Egger et al.'s (2011) Poisson Pseudo-Maximum Likelihood estimator, indicating a decline in trade to the extent of 72% in the absence of any preferential trade agreement between EU and UK (ie. The no-deal scenario) can be considered the most realistic value among those shown in table 3.

Even Baier et al. (2008) who use OLS regressions and gravity models and account for endogenous and exogenous macroeconomic effects of changes in the trade of goods, price levels, derive their data from bilateral goods trade from country pairs in a loose concept of economic integration agreements (EIAs), which include customs unions, FTAs, common markets, and economic unions worldwide (not limited Europe).

By contrast, Ceglowski's (2006) study similarly use gravity models but focuses on the services trade while limiting data to Organisation for Economic Co-operation and Development (OECD) countries. Findings by van der Marel and Sheperd (2013) are similarly restricted to the services trade and OECD countries, while a gravity model is used. Therefore, the predictive value of decline in trade is smaller than in the comprehensive study by Egger et al. (2011).

Taking into account the findings of other studies in the table which indicate a smaller extent of decline in trade, we could therefore reasonably expect a decline in trade in the range between maximum and minimum values.

5.7. Tariffs and Macroeconomic Effects

Under WTO rules, MFN status would apply to the UK with all its trading partners who are WTO members including all EU countries unless the UK negotiates other terms on bilateral levels, keeping in mind that no EU member country can enter bilateral trade agreements as the EU negotiates as a whole. Currently, average MFN import tariffs are 9%; while the type of goods the UK produces, however, would average out to a 5% increase in tariffs (HM Treasury 2016). Given these tariffs, some leeway exists for concluding some preferential trading agreements.

The table 5 below shows other studies that give us estimates of effects of reductions of trade on macroeconomic indicators on the UK and CARICOM assuming a prior balance of trade (idealistic). In pessimistic scenarios, we predict a decline of between 3.7% and 9.5% in Gross Domestic Product (GDP) in both CARICOM and UK. An important factor for the decline in GDP can be the decline in productivity due to higher transaction costs and redeployment of trade routes and supply chains, as well as the presence of higher regulation. These factors are difficult to estimate ex-ante, hence the wide range in predictions of GDP decline.

Table 5: Synthesis of recent studies on the impact of Brexit on CARICOM and UK

Estimates by:	OECD	LSE ⁴		TREASURY		FTA		WTO		NIESR ⁵		FTA		WTO		NIESR	
		WTO/FTA	EEA/FTA	EEA						EEA						WTO+	
Reduction in total trade (%)		-10 to -20	-12.6	-9						-11 to -16				-21 to -29		-22	
Reduction in FDI (%)		-10 to -45	none	-10						-10				-24		-24	
EU budget savings (% of GDP)		0.3 to 0.4	0.0	0.4						0.0				0.3		0.3	
Method	NiGEM		Estimated elasticities	tradeNiGEM						NiGEM						NiGEM	
GDP (% change)																	
Central estimate (%)		-5.1	-7.9	-3.8						-1.8				-3.2		-7.8	
Range (%)		-2.7 to -7.7	-6.3 to -9.5	-3.4 to 4.3						-1.5 to -2.1				-2.7 to -3.7		-7.8	
Wages (% change)																	
Central estimate										-2.7				-5.5		-7.0	
Ratio of GDP to trade declines		0.27 – 0.39	0.5 – 0.75	0.42						0.13				0.13		0.35	
Channels																	
Reduced Trade with EU	x		x	x						x				x		x	
Productivity losses from reduced trade in x			x	x												x	
CARICOM																	
Productivity losses from reduced trade in x			x	x												x	
UK																	
Reduction in FDI (UK and CARICOM)	x			x						x				x		x	
Productivity losses from reduced FDI (UK and CARICOM)				x													
Productivity gains from deregulation	x																

Source: Ebell and Warren (2016)

⁴ LSE – London School of Economics⁵ NIESR – National Institute of Economic and Social Research

5.8. Further Considerations and Potential Obstacles

With its recent Policy Paper, the UK seeks to accomplish two things at the same time. It envisages a facilitated customs agreement with the EU, in which the UK would recognize EU rules and tariffs and apply them if goods are destined for the EU (via the UK), but apply its own tariffs if the final destination for the goods is the UK. In the EU, all trade matters, including tariffs, are under the authority of the European Commission and are applied to all non-EU countries equally. The common practice of the EU is to establish common tariffs for goods from outside the EU – in the White Paper, however, the UK is proposing common internal UK-EU tariffs but being able to set its own tariffs to goods from outside the UK.

The above proposal has met with strong rejection by the EU. In the words of Michel Barnier, chief negotiator for the EU: “The EU cannot - and the EU will not - delegate the application of its customs policy and rules, value added tax (VAT) and excise duty collections to a non-member who would not be subject to the EU’s governance structures,” (Bleikinsopp and Bartunek, 2018). The issue is more profound as legislation would need to be changed within the EU to allow for such an arrangement. According to Barnier, “This complex customs system also poses a more fundamental question: How can the Union delegate the application of its customs rules to a non-member of the EU, who would not be subject to governance structures? Would that be acceptable or, simply, legally possible?” as stated by Bleikinsopp and Bartunek (2018).

In summary, the proposal relating to trade as outlined in the UK’s Policy Paper amounts to a customs union in which the UK would benefit from free trade. It will further ask the EU to relinquish its sovereign control of payments of customs duties for goods that arrive from outside the UK-EU customs area to a non-EU party, the UK in this case, for which there are no legal precedents. Barnier has called this an example of British cherry picking as indicated by Bleikinsopp and Bartunek (2018). As part of any customs union with the EU, treaty countries are restricted from negotiating free trade agreements with members outside such customs union. However, the UK’s Policy Paper is proposing just this – namely being part of the customs union while having control over trade with non-members. In other examples, the EU’s customs unions with Turkey, San Marino, and Andorra restrict those countries from engaging in free trade negotiations with non-EU countries due to the common application of

external tariffs. In other words, countries relinquish sovereignty over their trade deals with the rest of the world to the EU to be able to be part of the customs union. As a result, it is difficult to justify why the UK should be any different. Setting a precedent by acceding to the UK's request would put the entire trading structure of the EU into question, although the EU has since given cautious affirmative signals. This discussion therefore highlights the complexity of reaching an agreement relating to trade before the Brexit deadline in March 2019.

6. CARICOM Trade Facilitation Challenges

As CARICOM is a set of developing nations, a series of challenges have been identified that create barriers to trade facilitation. Some of the broad areas of concern are identified below:

- Excessive Government bureaucracy
- Inadequate customs procedures
- Poor utilization of information technology
- Lack of transparency
- Minimal cooperation between institutions supporting trade

Thus, any effort going forward must be designed to overcome these challenges and provide the fundamental conditions and tools to support a modern customs administration, which can facilitate international trade. Moreover, any deal and policy put in place must be geared towards promoting and expanding economic and technical cooperation among the developing countries within CARICOM.

7. Steps towards the Development of a Regional Policy Framework for Trade

In order to enhance this research agenda towards guiding future studies, the authors have proposed a framework that incorporates insights from the theoretical literature and practical approaches observed in trade policies. The research highlights that the main rules and regulations that constitute the main components of a trade policy. These are usually derived and implemented by Governments to govern cross border

transactions, however, they are sometimes constrained by international rulings. Thus with the globalization of the trade and the supporting systems, the movement of goods, evolving industrial bases and advances in information and communication technology (ICT), the trade policy framework requires professional operating systems that can be streamlined into new and existing institutions. It is further recognized that any post-Brexit trade policy developed for the CARICOM must involve a series of diverse policy instruments geared towards influencing the physical cross border movements of products, and the provision of services and economic exchange. In addition, such a framework must encompass policies to create a conducive environment for local traders or private companies to produce and trade. Thus the creation of enhanced trade liberalization environment and a reduction in barriers to trade.

For the purpose of this research, a list of concepts is formed, based on combining insights from the three institutional sources (World Bank, World Trade Organization, and the International Trade Centre) and satisfy the purpose of being meaningful to outlining a framework. Six processes are identified as important for the system to be performed effectively: namely, knowledge and capability development; building institutional and infrastructural capacity; developing tariffs, quotas and taxes; managing dispute settlement; coordination and integration of local expediences; and coordination of private sector development and investment.

7.1. Knowledge and capability development

The demanding requirements of global trade has fundamentally changed the way how trading has been done. As such, there is a need to upgrade the knowledge and capacity of the personnel involved in the trading of goods and services. Building networks can catalyse international knowledge diffusion and provide new opportunities for local capability. Ernst and Lundvall, (2000) discuss the importance of tacit knowledge in managing the uncertainties in globalization. This research is quite relevant in guiding the way how knowledge should be shared.

7.2. Building institutional and infrastructural capacity

The institutional role of government in the process of trade is providing a stable, supportive, and appropriately competitive environment for stimulating trade. Thus building institutional and infrastructural capacity entails the creation of an enabling environment with appropriate policy and legal frameworks. It further involves the development of the resources (human, material and financial) essential for effectively and efficiently managing the institution (White, 2007; Mullins and Christy, 2010).

7.3. Developing of tariffs, quotas and taxes

In general, there are two major techniques utilized to control trade imports; namely tariffs and quotas. A tariff is a tax on imported goods. A quota is a quantity limit. Quotas define the maximum amount that can be imported within a year. In general, the tariff must incorporate the preparation of a technical schedule of duties, or taxes on imported goods. For instance, Rege (2002) highlights the benefits that can accrue to trade as a result of binding of tariffs and the rules that are applied for valuation.

7.4. Managing dispute settlement

Unlike developed countries, the CARICOM region observe several drawbacks in attempting to successfully litigate trade disputes before dispute settlement panels and securing remedies against developed WTO member states. Thus making this part of the framework difficult to navigate. The main processes to be highlighted in the dispute resolution methods should simplify systems of litigation and arbitration which usually pass through the courts. However, prior to such means of dispute settlement, consideration in the framework should highlight less costly and time consuming methods like negotiation, enquiry, mediation, and conciliation

7.5. Coordination and integration of local expediencies.

The framework requires the identification and recruitment of adequate personnel with the required knowledge, expertise, experience, competence and leadership to coordinate and integrate local practicalities. For instance, there is a need for measures for effective cooperation between customs and other trade facilitation institutions. In addition, there

is a need for a joint approach to compliance and audit as methods that can enhance cooperation and coordination between relevant departments.

7.6. Coordination of private sector development and investment

The framework requires the promotion and expansion of the sale of goods between CARICOM – UK and CARICOM – EU, with emphasis on facilitating such imports and exports. Thus from a CARICOM standpoint, there is a need to support investments aimed at taking advantage of the opportunities and strengthening the competitiveness of the CARICOM business community in the UK and EU markets. Such development would inspire the enablement of the creation and operation of regional joint ventures and the development of technical and scientific cooperation activities, which would spur business activities.

8. Conclusion

The impact on CARICOM following a Brexit will be substantial owing to its large share of EU-bound trade being with the UK. Post-Brexit, the UK is likely to lose its advantage regarding customs duties, however, some of the impact will be cushioned as re-exports will be channelled to the EU bypassing the UK.

Owing to CARICOM countries being developing states with low levels of processing industries, CARICOM is more vulnerable to other global events close to home and further afield exposing it to the effects of macroeconomic ups and downs as severe financial crises in the US and UK have shown previously, leading to a fall in trade within the CARICOM region. Overall, the existence of the EPA is advantageous and cushions some of the negative effects of post-Brexit. However, the redeployment of current trade routes to the EU via the UK and a renegotiation of trade terms with the UK following Brexit, will likely lead to further volatility in the region, which is not helped by the fact that currencies are pegged to the US Dollar, meaning reduced demand for CARICOM goods will cannot be compensated for by devaluating local currencies, but rather leading to higher interest rates which may stifle macroeconomic activity in the near to medium term. To reduce negative impact, an EPA with the UK needs to be negotiated and ratified as soon as possible. As an organisation of many states, CARICOM's voice carries some importance and negotiating power.

As the priority for the UK to negotiate an EPA with CARICOM is not currently known following the EU's stance to negotiate the exit first before any future relationship is negotiated, it would be in the best interest of CARICOM to develop its trading relationships with the remaining EU-27 bearing in mind the inevitability of post-Brexit era. In the long term having a strong trading relationship with both the EU and post-Brexit UK would be beneficial for CARICOM. Thus there is definitely a need for the development of a policy framework for trade that maintains a mutually beneficial agreement of wants and needs while trading.

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Challenges for the Islamic Finance and banking in post COVID era and the role of Fintech

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ABSTRACT

Novel Corona Virus (COVID-19) pandemic has created a huge disruption in the finance world and it poses another challenge to Islamic finance after the global financial crisis to provide an alternative and sustainable finance. Islamic finance has a large market share in industries such as, microfinance, small and medium enterprises, and retail lending. They are the worst hit during the ongoing pandemic. The magnitude of the ongoing financial crisis is expected to be different from the global financial crisis of 2008; therefore, it poses different challenges for Islamic finance and banking. It requires a different set of financial services, strategies, and technologies to overcome this challenge. Against such a backdrop, the present study aims to analyze the challenges posed by COVID-19 to the Islamic finance and how disruptive technological innovation called Fintech can be utilized to address those challenges. The study also presents a critical analysis of the Islamic finance and the role of Islamic finance in creating a more sustainable financial system post COVID.

ملخص

تسببت جائحة فيروس كورونا المستجد (كوفيد-19) في اضطرابات كبيرة على مستوى عالم المال، وبذلك شكلت تحدياً إضافياً في مجال المالية الإسلامية بعد الأزمة المالية العالمية بخصوص توفير تمويل بديل ومستدام. فالمالية الإسلامية تحظى بحصة مهمة في السوق على مستوى عدد من المجالات مثل التمويل الأصغر والمشاريع الصغيرة والمتوسطة والقروض الصغيرة. وهذه المجالات عي الأكثر تأثراً بتداعيات الجائحة التي لم يتم بعد السيطرة عليها. ويتوقع أن تختلف حدة الأزمة المالية الراهنة عن الأزمة المالية العالمية لعام 2008، لذلك فهي تطرح تحديات متنوعة أمام الخدمات المصرفية والمالية الإسلامية. ولتجاوز هذه التحديات يتعين توفير مجموعة مختلفة من الخدمات وتطوير استراتيجيات وتقنيات جديدة في مجال المالية. وعلى إثر هذه الخلفية،

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تروم هذه الدراسة تحليل التحديات التي تفرضها جائحة كوفيد-19 على المالية الإسلامية والسبل الممكنة لاستخدام الابتكار التكنولوجي المضطرب، أو ما يسمى بالتكنولوجيات المالية، في التصدي لهذه التحديات. كما تعرض الدراسة تحليلاً نقدياً للمالية الإسلامية ودورها في إحداث نظام مالي أكثر استدامة بعد مرحلة كوفيد-19.

ABSTRAITE

La nouvelle pandémie du virus Corona (COVID-19) a créé un énorme bouleversement dans le monde de la finance et pose un nouveau défi à la finance islamique après la crise financière mondiale, afin de mettre en place une finance alternative et durable. La finance islamique a une grande part de marché dans des secteurs tels que la microfinance, les petites et moyennes entreprises et les prêts de détail. Ils sont les plus touchés par la pandémie actuelle. L'ampleur de la crise financière actuelle devrait être différente de celle de la crise financière mondiale de 2008 ; par conséquent, elle pose des défis différents à la finance et à la banque islamiques. Pour relever ce défi, il faut un ensemble différent de services financiers, de stratégies et de technologies. Dans un tel contexte, la présente étude vise à analyser les défis posés par COVID-19 à la finance islamique et la manière dont l'innovation technologique perturbatrice appelée Fintech peut être utilisée pour relever ces défis. L'étude présente également une analyse critique de la finance islamique et du rôle de la finance islamique dans la création d'un système financier plus durable après la COVID.

Keywords: COVID 19; Corona virus; Fintech; Islamic finance; sharia; Financial crisis; Pandemic

JEL Classification: C36, C51, G01, G11

1. Introduction

First COVID-19 case was reported in China on 17 November 2019. Currently more than 40.35 million people are infected and around 1.11 million have already lost their lives. (As on 19/10/2020, 4 PM GMT. (Source www.who.int). Governments all around that world have responded with a lockdown to prevent the spread of virus. Consequently, it has brought economic activities to a halt resulting in a steep fall in production, disruption in supply chains, loss of income, and disruption in the flow of credit (Fernandes, 2020). The health emergency has turned into a financial crisis mainly due to two reasons. First, the spread of virus encourages lockdowns, social distancing, and quarantines by governments around the globe, which results in the shutdown of economic activities, financial markets etc. Second, the rate at which the virus is

spreading creates a panic and uncertainty in the market encouraging customers to opt for safety in consumption and investments (Ozili, 2020).

There is still no consensus about the definition of Fintech and exactly it means. Conceptually, FinTech is a new type of financial services provided through technologies to broad type of users (Schueffel, 2016). Fintech is defined as “The fusion of Information Technology and Finance for providing the financial services at an affordable cost with a seamless user-friendly experience” (Rabbani et al., 2020).

Islamic Fintech can be defined as –

- Delivery of Islamic finance products with the use of technology,
- Any Fintech catering to the unmet needs of Islamic finance customers with an objective of financial inclusion, removal of income inequality and bringing social justice (Haider et al., 2020),
- Or in simplest of the words, “It is the digital delivery of Islamic finance.”

Both Fintech and Islamic Fintech share the same meaning as far as the definition is concerned. The differences lie in ‘sharia’. Islam accepts any innovation and disruption with open arms if it does not violate the basic ethos and principles of sharia. For example, any Fintech is permissible and acceptable as per Islamic finance if there is clear evidence that it does not violate or contradict any principle laid down by the sharia. In other words, any innovation is welcome in Islam if there is no clear evidence prohibiting it (Hasan, 2020).

Islamic finance challenges post COVID

The COVID 19 pandemic has already done a considerable amount of economic destruction and caused a significant amount of damage to every facet of life including financial markets (Baker, 2020). The post COVID challenges for Islamic finance can be summarized as follows:

- The magnitude and enormity of the crisis is expected to be very different from the global financial crisis of 2008 and will have to be managed differently. Global financial crisis are more suited to the nature of Islamic financial services and it is

unscathed because of its prohibition from speculation and risky assets (Kayed and Hassan, 2020).

- Islamic financial market is still young and in the growing stage. This growth results in a large number of competitors, who are trying to compete to grab a significant portion of market. According to the Islamic Finance development report the Islamic finance market grew to around US\$ 2.4 trillion in 2018, an increase of 3% as compare to 2017 (IFDI, 2018).
- The growth of the Islamic finance is slowing in the last few years due to the slowdown in the three leading market layers including Saudi Arabia, Iran, and Malaysia. These three countries contribute around 65% of the total Islamic finance assets. The causes of slowdown in these countries are attributed to the fall in crude prices along with other factors (Ready, 2018).
- Islamic finance has a large market share in other Islamic Financial Institutions (OIFI). The total value of assets grew to around 140 billion in 2018 (Reuter, 2018). The OIFI includes the institutions like microfinance, small- and medium-sized enterprise (SME), Investment firms and funds etc., and these institutions are the worst hit due to current pandemic (McGeever, 2020).
- The top two markets for Islamic finance, Iran and Saudi Arabia, are largely an oil dependent economy and sharp declines in crude prices poses another challenge for the Islamic finance. Forecast suggest it will fall further by around 10% (Albulescu, 2020).
- To give relief to the citizens and bank customers, the regulators have announced the postponement of loan payments for the bank's customers from 3 months to 6 months. This decision by the regulators is not a happy sign for the Islamic bank as the banks will have virtually zero cash inflows in the next six months. Banks around the world are facing liquidity problems and have already run out of cash (Alvarez, 2020).

- Globally, banks will have to brace themselves with either zero or very low profits for a prolonged period due to the disruptions caused by COVID 19. If we take the example from the last quarter (April to June 2020), the banks are expected to have negative operating leverage due to less revenue as cost is expected to remain stagnant. Due to this fear, banks are not serving new customers as they fear that they might lose the existing liquidity (Acharya, 2020).

This current situation is unique, though it is often compared with the global financial crisis of 2008. The comparison of COVID 19 with the global financial crisis is summarized in following points.

Table 1: Comparison between Global recession and Global pandemic

Global Financial Crisis 2008	COVID 19
Started in real estate and spread only to financial and real economy.	COVID 19 is exerting a more real and abrupt damage to the real economy. It has affected both demand and supply chain simultaneously.
Slow: Subprime loan are granted to the Americans with no job and assets until 2007. Later the risk is transferred to other sectors resulting in uncertainty and policy makers have time to react and tackle this unprecedented situation.	Fast and hardly any time to react: COVID 19 starts in January 2020 and spread to the whole world within 5 months taking the world economy to a standstill. Policy makers and regulators hardly have time to react.

Common view by Islamic financial scholars on Economic Impact of COVID-19

The majority of the Islamic scholars are of the opinion that the financial crisis is due to the global pandemic could have been avoided if we had Islamic financial system in place since it is a sheer failure of conventional financial system to respond in an ethical manner. Maximization of profit and greed is inherent in the conventional finance world. This focus results in changes in behavioral patterns of the consumers and their reluctance to

spend and unwillingness to help those who are in need. Islamic scholars are further on of the opinion that a more compassionate, caring and ethical approach is needed to tackle such crises. Islamic finance tools such Waqf, Qardh-Al-Hasan, Sadaqa and Zakat will help in injecting immediate liquidity into the market (Haider et.al. 2020; Radwan, 2020; Zandifar, 2020; Al-Tawfiq, 2020).

As the world is still forced into quarantine and isolation due to the prolong lockdown to stop the spread of the virus (Anderson et.al., 2020), the discussion is turning to the road ahead regarding the financial and economic impact and what role Islamic finance is going to play. Furthermore, the role it plays in the countries in which it operates comes under consideration. The present paper analyses the economic impact of COVID 19 and role of Islamic finance in overcoming this crisis and how Fintech can be utilized by the Islamic financial institutions to do so.

2. IN SEARCH FOR ‘THE SOLUTION’: Does Islamic finance have the solution?

As discussed above, the current crisis is unlike the global financial crisis of 2008 where Islamic finance established itself as the potential challenger to the conventional financial system (Ahmed, 2010). There is no denying that the nature and characteristics are different, and it will need a herculean task to get rid of this crisis. Now, the million-dollar question is, **Does Islamic finance have the solution?**

The answer is in affirmative, Yes, it has the solution and Islamic finance will lead the global financial system to overcome this crisis. There are strong theoretical and behavioral justifications to this argument. Let us discuss how Islamic finance will lead the finance world post COVID 19 in fight of the economic consequences from COVID 19.

- ▶ Islamic finance can be evaluated on its two basic components:

1) It is expected that the crisis will have minimum or no effect on the Islamic financial institutions because of its deep-rooted values.

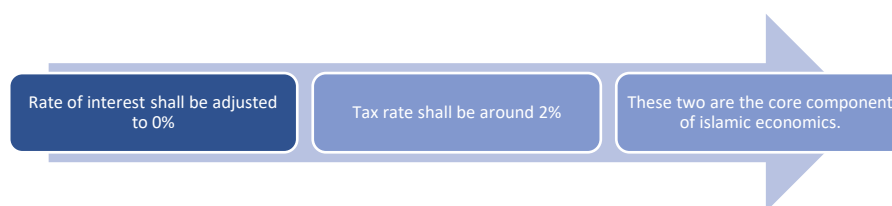
- Islamic finance prohibits interest and Islamic banks do not have any toxic assets.

- Lack of financial reengineering in Islamic finance and prohibition of assets like, options, futures and swaps.

2) Islamic finance is expected to deliver a significant contribution in the field of finance in recovery post COVID.

- ▶ Islamic finance considers money as a medium of exchange and no direct financing is allowed without assets backing. Instruments like social Sukuk are issued with backing from real assets only.

A famous French economist and Nobel laureate M. Allais is of the opinion that structural reform is the way to get out of such crises (Allais, 2013). He proposed the idea that-



There are many other economists and cotemporary researchers who believe like Allais that, structural reforms are the way to go forward and Islamic finance is naturally positioned to do so (Hassan, 2010; Poon, 2018), as in case of Islamic finance,

Islam prohibits interest (*riba*). Islam considers money as a medium of exchange and it must not be used as a commodity. Muslim legists who contributed to the development of Islamic finance considers *riba* as ‘interest’ and ‘predetermined return on capital’, as it literally means an increase, expansion or growth or benefit accrues to the lender in a loan transaction. Prohibition of *riba* in Islamic finance maintains that Islamic finance is interest free financial system and is based on the principle of profit and loss sharing (Saeed, 1996).

- ▶ Zakat is one of the basic pillars of Islam and everyone is required to pay a *Zakat* 2.5% of the assets they have owned over a year.
- ▶ *Zakat* is a major financial instrument intended to remove income inequality and bring socio-economic justice in the society. Zakat is one of the basic requirements which

Muslims must perform as it has been performed historically. Zakat is an important tool in poverty alleviation and helping poor as during the period of *Khalifa Umar Bin Khattab* and *Umar Bin Abdulaziz*, poverty was eliminated (Nadzri, 2012).

Islamic finance has various social finance tools which can be utilized and customized according to the varied needs of customers. The following are the Islamic finance tools which can be used at different stages of COVID.

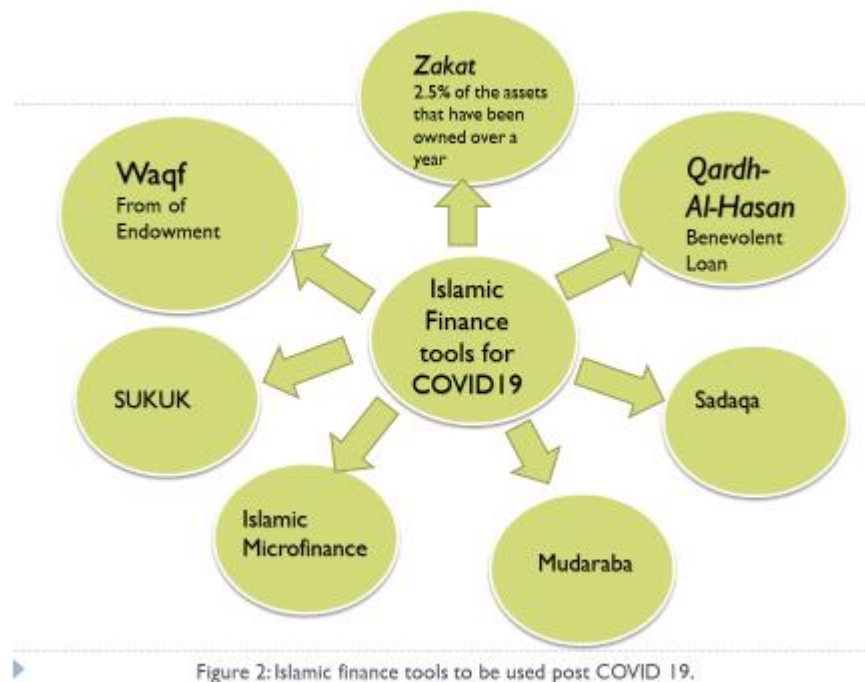
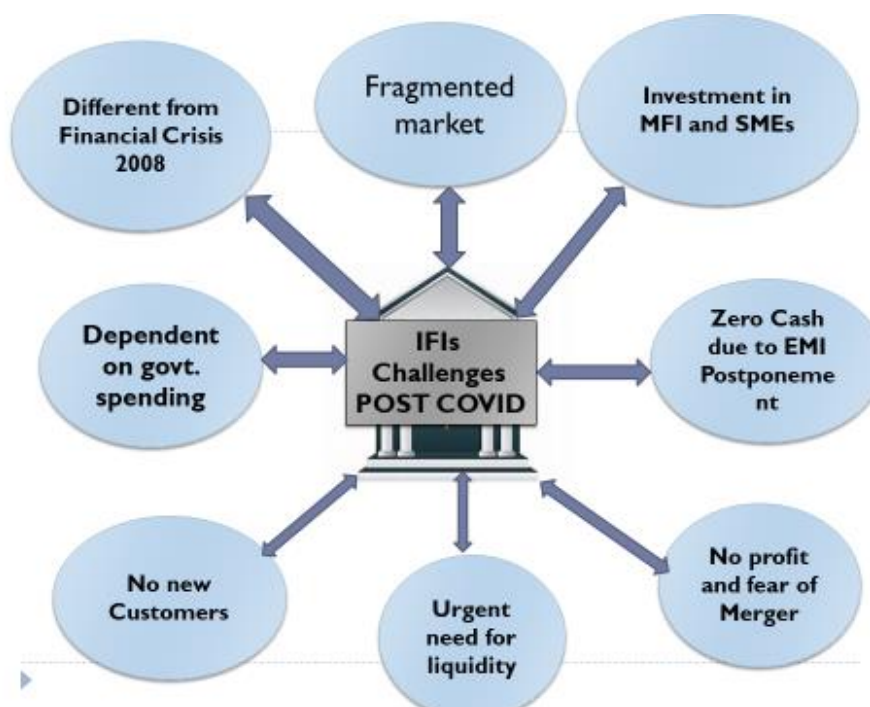


Figure 2: Islamic finance tools to be used post COVID 19.

Post COVID challenges for Islamic Fintech: COVID 19 has traumatized the world and has presented a big challenge in front of the scholars, regulators, and policymakers to find an immediate solution with Islamic finance no exception. The challenges posed to the Islamic finance is summarized in the following figure.

Figure 3: Islamic Fintech Challenges Post COVID

Some of the biggest challenge for the Islamic finance are-

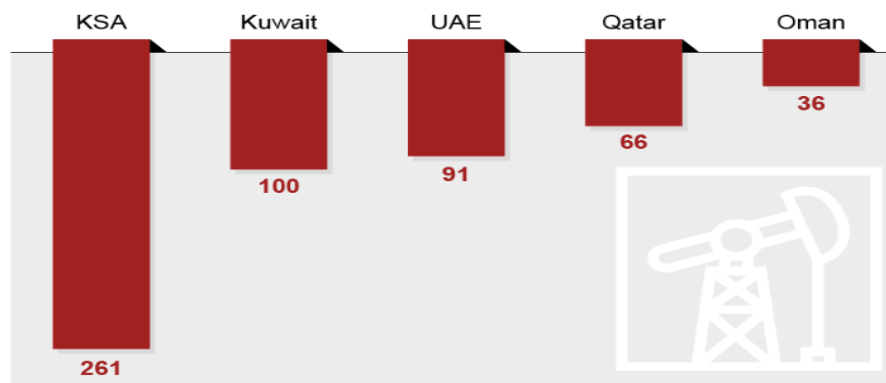
Fragmented market: The pandemic has almost froze the entire world. As the virus started to spread globally, the countries started to isolate themselves, create restrictions on travel and communication. The world economy is almost certain to witness a financial crisis more severe than Global financial crisis of 2008 (Ozili, 2020).

Investment in MFI and SMEs: In African and Asian countries, Islamic finance has a large market share in MFI, SME, and retail lending. The worst hit due to COVID are the SMEs, low income and daily wage workers. The large corporations have a large capital cushion and government support.

Dependent on govt. spending: Unlike the situation for IBs in Asia and Africa, the Islamic banks in Arab countries are dependent on government spending. The huge drop in oil prices have serious implication for them.

The dual shock has slashed oil revenues

Loss in state oil revenues* for 2020, in US\$ millions per day



* Assuming oil price is sustained at \$20 per barrel for rest of the year
Source: HIS Markit, Flightradar24, Strategy and analysis

Source: HIS Markit, Flightradar24, Strategy and analysis.

Zero Cash due to EMI Postponement: Islamic banks are facing liquidity problem due to EMI postponement announced by the government. Islamic banks are forced to offer flexibility to restructure the ongoing loans. Islamic banks have virtually no cash due to no inflow of cash.

Urgent need for liquidity: Liquidity has an asymmetric effect on bank's lending. The negative effect on liquidity is more significant than positive effect or an increase in liquidity. Islamic banks are particularly exposed to the market liquidity due to COVID 19.

No new Customers: The customers are reluctant to invest due to fear and uncertainty. Due to the liquidity risk, the IBs are not ready to serve new customers. No new customers can affect the profit adversely.

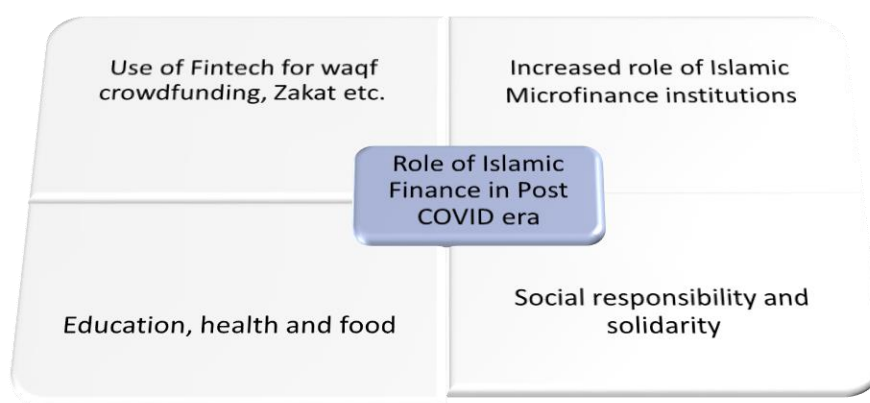
No profit and fear of Merger: Asset quality of loans for banks right now is the biggest concern which will impact profitability. Once profit goes down, capital and equity deteriorate and shareholders, with multiple institution, will go for a merger. The regulators might also encourage merger and consolidation.

The role of Islamic finance in Post COVID era.

Islamic finance has the potential to overcome any challenge posed by the economic disruption, such as financial crises and COVID 19 at the

individual and corporate levels (Haider et. al., 2020; Kayed and Hasan, 2011; Hassan and Kayed, 2009). COVID 19 has ominously slowed down the core of the Islamic economies including Saudi Arabia, Iran, and Malaysia. Social instruments under Islamic finance, such as *Qardh-Al-Hasan*, *Zakat*, *Social Sukuk* and *Waqf* are viable options to be used by the Islamic banks and IBs during and after COVID to help the affected individuals, SMEs, and corporations by providing direct cash transfer and giving access to the health care and education facilities (Haider et. al., 2020). Islamic finance is based on the principle of social justice and equitable distribution of income and these two characteristics make it as the suitable path under crisis (Smolo & Mirakhor, 2010).

Figure 2: Role of Islamic finance in the post COVID era



The role of Islamic finance in Post COVID era can be explained in the following points:

1. Use of Fintech for Waqf crowdfunding, Zakat etc.

Fintech has already changed our day to day lives with its disruptive technological innovations in the field of finance (Rabbani, 2020). Our daily lives are now being knotted to the technological innovations where financial services are delivered through the artificial intelligence-based technologies (Haider, 2020) and, robots are the financial advisors (Khan and Rabbani, 2020a; Khan and Rabbani, 2020b). Most of the financial

services are now tied to technology for its delivery. The use of Blockchain and artificial intelligence has already revolutionized the finance world (Hasan and Hassan, 2020). The use of Fintech in delivering Islamic financial services such as Waqf, Crowdfunding, and Zakat etc. will make it more transparent, efficient, innovative, attractive, and user friendly to deliver the financial services to the customers (Todorof, 2018).

2. **Increased role of Islamic Microfinance institutions:** The concept of Microfinance comes from a Bangladeshi economist, Dr. Mohammad Yunus, founder of Grameen Bank Bangladesh and Nobel peace Prize winner in 2006. Dr. Yunus describes microfinancing as, “the mode of finance for providing money to the poor to assist them and become self-employed and independent” (Tevanti, 2013). Many researches have proved that poverty alleviation can be achieved by providing assistance to the last man standing in the queue or by fulfilling the social needs: extending credit to the more potential recipient, poorer in the far reaching, hard to reach geographical location (Amran et. al., 2014; Hassan and Ashraf, 2010; Choudhury, 2014). Islamic Microfinance Institutions (IMFIs) are considered as a successful tool in financing the interest free loan to the poor in the form of *Qardh-Al-Hasan* (Amran et. al., 2014). As the number of poor around the world is expected to increase post COVID, IMFIs are going to play the huge role in healing the damaged caused by the COVID 19 on the poor and vulnerable. The financing activities performed by the IMIs do not involve anything prohibited under sharia law like, *riba*, *maysir*, or *gharar*. Moreover, visualizing the post COVID scenario, it is a more practical and appropriate financing method as the loan is given without interest, no guarantor required.
3. **Education, health and food:** Some of the more important areas that need immediate attention during and post COVID are education, health, and food security to the poor and vulnerable section of society (Deai, 2020). Islamic considers these three as fundamental rights of human beings besides the other rights, such as right to justice, right to respect, and right to freedom (Hassan, 2003). Islamic finance is positioned to play a decisive role in providing food, health, and education to the society. For Muslims, Holy Qur'an being the god's own word and is the principal and most trustworthy source of information as Qur'an powerfully supports and encourages the ultimate human rights (Hassan, 2003).

4. **Social responsibility and solidarity:** The accelerating social and economic problem posed by the globalisation and growth of technologies has elevated new questions regarding the corporate social responsibility, ethical, and moral compass where business is being done. Corporate Social Responsibility (CSR) has emerged and developed into a field of study and a lot of western scholars' have given theoretical groundings for the CRS initiative. The concept and theory of Islamic finance related to social responsibility has gained popularity and acceptance among the western scholars and policy makers (Hassan & Harahap, 2010). Among the most important objective of Islamic finance is the creation of social justice, responsibility, solidarity, and the purging of corruption in the business transaction (Elmelki, 2009).

3. COVID 19 and role of Islamic Fintech

Islam embraces all innovations as long as it does not violate the ethos and principles of sharia. Islamic Fintech firms represent the next wave of disruptive growth in the field of Islamic finance industry for providing the seamless user experience at the least cost (Rabbani and Khan, 2020). Fintech is already very popular among the Islamic finance consumers as there has been around a 72% increase in the users of Fintech in last 5 Months-Feb to June 2020 (Fu & Mishra, 2020). The Islamic Fintech is going to be the game changer for Islamic finance mainly due to the following reasons-

Figure; 5. Characteristics of Islamic FinTech. Source: adapted from Rabbani et. al., 2020

As put by the (Rabbani et al., 2020) the Islamic Fintech is flexible, attractive, efficient, and it leads to financial inclusion and innovation.

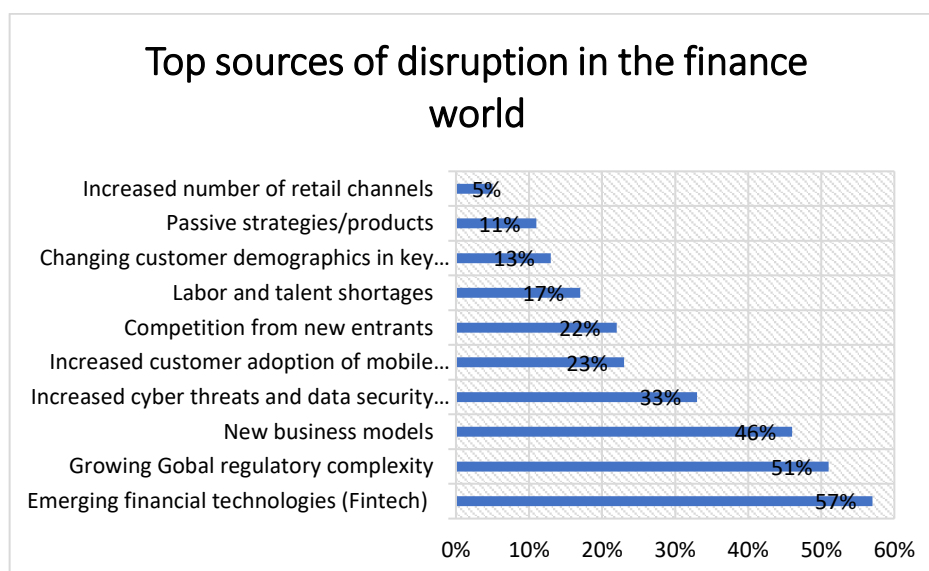
The success of Islamic finance and magnitude of the role it will play in recovery post-COVID will mainly be determined by the use and adoption of Fintech in the next couple of months (Haider, 2020). Fintech and delivery of financial services by Islamic banks and financial institutions are going to be complementary to each other, due to the following infrastructural, behavioral, and technological changes in the society.

Social Distancing for the Foreseeable Future: Social distancing has been discovered as one of the important tools to mitigate the spread of the corona virus and it is going to stay for a considerable period of time even after the virus ends (Painter, 2020). The world post COVID is going to be different and it is expected that there will a significant change in the behavioral pattern of the people. Social distancing is here to stay even after the COVID because it has put a psychological mark on the lives of individuals (Pathan, 2020).

A Cashless Post-COVID Society: Across the globe, as the lockdown has eased up and the economy is moving back to the normal, traders and customers are looking to minimize the fear of spreading the virus and maintaining the social distancing. Cash is making people nervous. Shopkeepers and business owners are asking the customers to use cards, digital payment apps and other Fintech based payment services instead of cash. Some researchers, like Olagbaju et. al., believe the finance world post COVID is going to be cashless. As cashless is easy, convenient, and efficient, COVID has only given a strong reason to the people that cashless is the way to go forward by getting rid of cash and risk associated with it. Going cashless has its own risks, such as compulsive shopping, online hackers, and glitches. The present study believes that this digital shift is inexorable, and the world should embrace this shift rather than resist it.

Greater Integration with Fintech Companies and Financial Institutions: Fintech is the biggest disruption in the field of finance and evolution. Fintech companies have forced the Islamic banks, Takaful companies and other Islamic financial institution to face the new reality. The bestselling products, services, and business models are no longer valid in the current digital market space. It must be replaced by the digital, more efficient technologies. KPMG conducted a survey on the greatest source of disruption in the world of finance. The results are shown in figure 4.

Figure 5: Source: compiled from KPMG International global Fintech survey, 2017



As it can be seen from the above figure that Fintech is the biggest disruption of present time (57%), followed by the complexity in regulation and new business models with 51% and 46% respectively. There is a strong opportunity for the Islamic banks and Islamic financial institutions to partner with these Fintech companies and take advantage of the growing market.

Application of Fintech services such as KYC / AML, Blockchain, Big data and Machine Learning

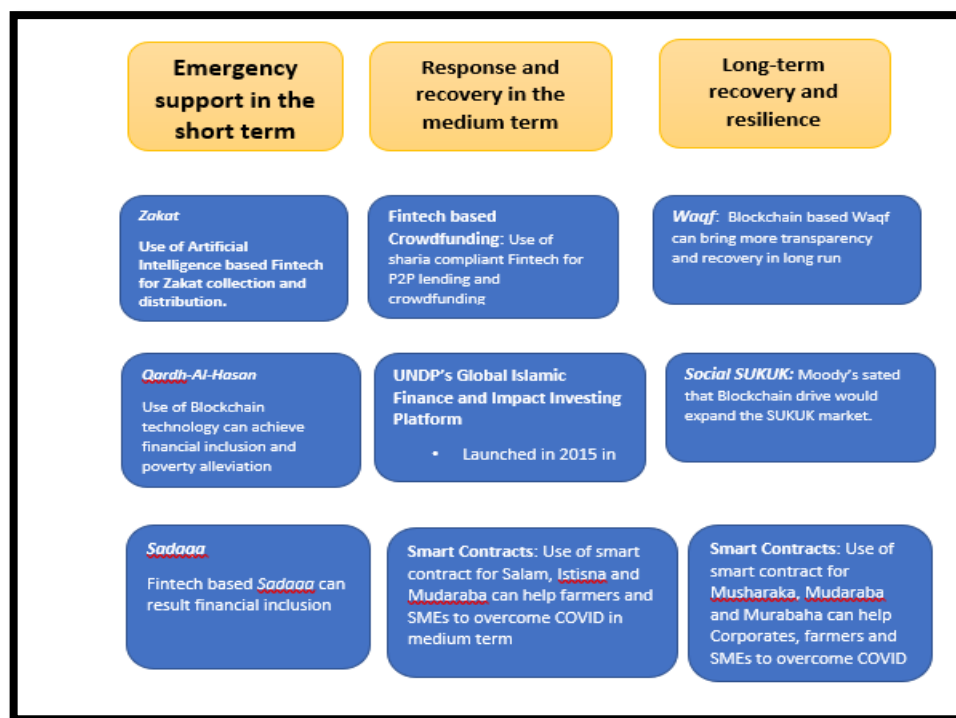
in Islamic Finance:

The Fintech services are available for Know your customer (KYC) and Anti money laundering (AML) since they automatic identify and verify transactions done by the Fintech to ensure the safe and secure online transaction. The first step for the AML is KYC and it is performed by the high-tech artificial intelligence-based Fintech applications. Also, the use of Blockchain, big data, and machine learning in Islamic finance will bring more efficiency and transparency for the consumers as well as regulators and IfIs (Sun et al. 2020; Rabbani, 2020a).

From all the above arguments, it can be safely said that COVID 19 provides an opportunity for the Islamic Fintech to grow and provide an alternative financial system. Also, Islamic Fintech can serve the unserved through financial inclusion and poverty alleviation. The focus of Islamic Fintech is on delivering innovative financial services by complying sharia. The brightest part is that the Islamic financial institution and Islamic banks have realized that, and Islamic Fintech are partnering with Islamic banks instead of competing with them (Khan and Rabbani 2020).

The use of Fintech post COVID:

Figure 6: Use of Fintech post COVID

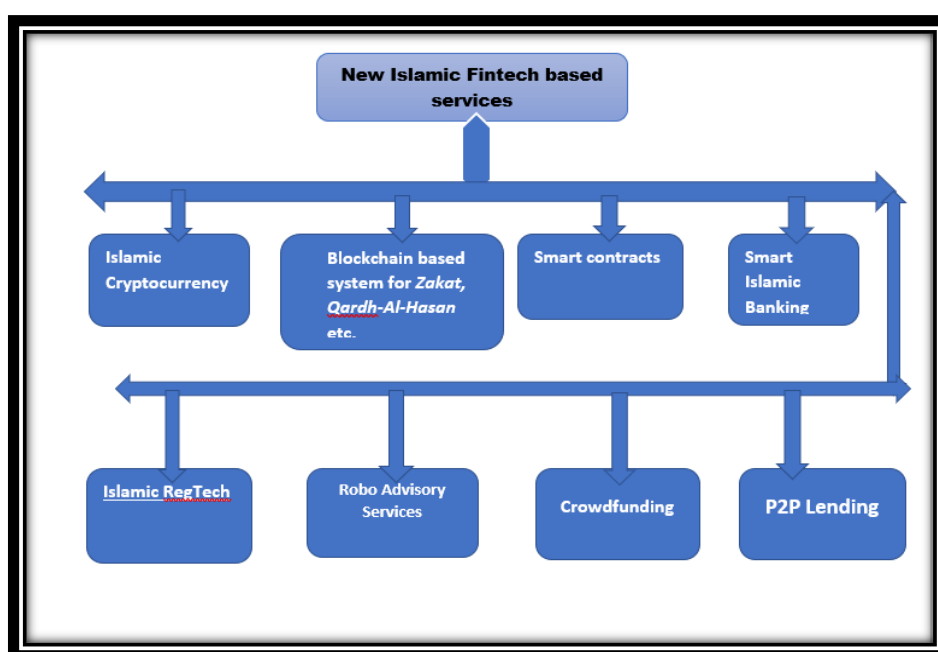


New Islamic Fintech based Financial Services Post COVID:

Epidemic coronavirus (COVID-19) has snowballed into an economic crisis, causing massive emotional and financial challenges for consumers, societies, and harmed projects. Companies wrestle with a number of challenges, from the logistics sector to workplace and supply chain operations, finance and cash, tax, and trade. In addition to meeting its own

problems, the Islamic finance is well positioned to fight this pandemic with help of Islamic Fintech., Fighting is going to be challenging and interesting for Islamic financial institutions. The present situation provides a major opportunity for IFIs and the reaction to which will have a profound effect on their long-term performance, achievement, and industry positioning. It gives a perfect platform to Islamic financial institutions to try and launch new and innovative Fintech based financial services and tap the untapped market.

Figure 6: New Islamic Fintech based services



Islamic cryptocurrency:

A cryptocurrency is an internet based digital asset secured by the technology called cryptography. It is very secured as it is almost impossible to double spend or counterfeit. There is a large pool of Muslim investors who want to invest in bitcoin but are reluctant due to sharia compliance. They must be given an option of investment in a less volatile Islamic cryptocurrency (Baker, 2017). There is possibility to issue the Islamic Cryptocurrency if the volatility issue is resolved (Alzubaidi, 2017). Islamic Cryptocurrency can be a popular Islamic finance tool post COVID to attract new investors and mobilize resources.

Sharia compliant gold backed cryptocurrencies are already in the market, Eg. X8 currency, OneGram etc.

Blockchain based system for *Zakat, Qardh-Al-Hasan* etc.

Blockchain is the decentralized distributed ledger to record the financial transaction. Blockchain technology can be applied in the financial services such as- *Zakat, Qardh-Al-Hasan, P2p lending and Mudaraba* etc. Blockchain technology will bring more transparency and efficiency (Khan, 2020). Blockchain technology can also be used for other transactions, such as recording land deal etc.

Smart contracts:

Smart contract are used to facilitate the transfer of digital assets based on pre-agreed terms and conditions. One of the basic objectives of Islamic finance is to bring transparency and efficiency in its dealing and smart contracts help to achieve this objective. The digital smart contract is definitely the future of finance and it will replace the traditional paper based contract since it helps in bringing more reliability and transparency without endangering its legitimacy (Rahim, 2018).

Smart Islamic banking

The world smart is very often used now a day for smart cities, smart phones, and smart banking. The "smartness" is fundamentally attained by embracing the innovative and disruptive technologies such as automation, cloud IoT, etc. Smart banking means more intelligent and tech based approach to customer service in providing financial services. Smart Banking is a new concept in Islamic banking where customer engagement and satisfaction is taken to another level. Example: Qitmeer is the first next generation Islamic banking platform based on BlockDAG, which will serve the Islamic bank customers for ethical investments asper the *Quran* and *Sunnah* (Rabbani, 2020).

Islamic RegTech

Islamic RegTech is a blend of both regulation and technology, which is aimed at enhancing the transparency, consistency, and standardization of regulatory processes in Islamic finance. It is critical to ensure that technological advancement does not compromise the principles of sharia.

There is need to have a balanced RegTech to promote innovation and to keep a check on the sharia compliance of the Fintech innovations.

Robo advisory services

The role of Artificial intelligence (AI) is becoming increasingly important in the study of banking and finance. Banks and financial services organisation are using the robo advisory services for providing financial services to customers. It will change the financial services experience forever. Robo advisory services for Islamic banks include Chatbot for financial advice and AI based Zakat calculation. (Khan and Rabbani, 2020a; Khan and Rabbani, 2020b)

Crowdfunding and P2P lending

A FinTech initiative, P2P lending and crowdfunding has provided that avenue to the borrowers. It is easy, faster, cheaper, and affordable medium of obtaining finances directly from the public. Crowdfunding has become the first-choice source of financing startups experiencing very high growth. It has the potential to become the largest challenger to the traditional medium of finance. Crowdfunding and P2P lending is going to be the future medium of finance (Taha, 2014).

Conclusion:

COVID 19 has disrupted the entire finance world as everyone around the globe from researchers to policy makers are trying to find a solution and provide a stable and sustainable economic system. Although, the nature of current crisis is different from the crisis in 2008, but the experience and confidence of Islamic finance will play a crucial role in re-establishing Islamic economics as an alternative system to the conventional economics. The disruptive innovation such as Islamic Fintech provides an equal ground to the Islamic finance to compete and thrive. Assuming that the outbreak will be a defining moment in the recent times is logical, and we draw the conclusion that now the world we humans enter will be significantly different than the one we thought we knew before. We are expected to see an increase in digital Fintech based operation because of the COVID-19 issue. The role of Islamic Fintech and adoption of Fintech by the Islamic finance customers will be significant in recovery post COVID.

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Exploring the Impacts of Inflation, Interest Rates, and their Uncertainty on Deposits and Advances of Conventional and Islamic Banks of Pakistan

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ABSTRACT

This paper examines the effects of inflation, the nominal interest rate, and their uncertainty on deposits and advances of conventional and Islamic banks of Pakistan. The main aim of the paper is to examine whether the effects of both types of uncertainty differ for conventional and Islamic banks. To carry out the empirical analysis, annual data covering the period 2008-2015 for a sample of 25 banks are used. To overcome the problem of heteroskedasticity in the dataset, the generalized least square (GLS) estimation method is applied. We find that the capital adequacy ratio, bank size, the inflation rate, inflation rate uncertainty, and interest rate uncertainty have significant impacts on conventional banks' deposits. We also find that although unexpected variations in the inflation rate have positive impacts, unexpected variations in the interest rate adversely affect conventional banks' deposits. In the case of Islamic banks, only the capital adequacy ratio, bank size, and the inflation rate have a significant impact on deposit growth. The results also reveal that the capital adequacy ratio, credit risk, bank size, the inflation rate, the interest rate, and its uncertainty have significant impacts on conventional banks' advances. Yet, we show that unexpected variations in the interest rate positively affect conventional banks' advances. Regarding Islamic banks, the capital adequacy ratio, credit risk, bank size, the rate of inflation, and the interest rate all have significant impacts on advances.

ملخص

تناقش هذه الورقة البحثية آثار التضخم وسعر الفائدة الإسمي وأوجه عدم اليقين التي تفرضها على الإيداعات والقروض المصرفية في باكستان على مستوى البنوك التقليدية

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والإسلامية على حد سواء. ويتمثل الهدف الرئيسي لهذه الورقة البحثية في دراسة ما إذا كانت تأثيرات كلا وجهي عدم اليقين تختلف على صعيد البنوك التقليدية والإسلامية. ولأغراض التحليل العملي، تم الاعتماد على بيانات سنوية تغطي فترة 2008-2015 لعينة تغطي 25 بنكا. ولتجاوز مشكلة اختلاف التباين في مجموعة البيانات، يتم تطبيق طريقة مقدر المربعات الدنيا (GLS) المعممة (GLS المعممة) وتوصلنا إلى أن العوامل المتمثلة في نسبة متانة رأس المال، وحجم البنوك، GLS المعممة (GLS المعممة) ومعدل التضخم، وأوجه عدم اليقين المتعلقة بالتضخم، وأوجه عدم اليقين المتعلقة بأسعار الفائدة لها آثار كبيرة على إيداعات البنوك التقليدية. كما توصلنا أيضا إلى أنه رغم كون بعض المتغيرات غير المتوقعة في معدل التضخم لها آثار إيجابية، إلا أن المتغيرات غير المتوقعة على مستوى أسعار الفائدة تؤثر سلبا على إيداعات البنوك التقليدية. أما في حالة البنوك الإسلامية، فإن نسبة متانة رأس المال وحجم البنوك ومعدل التضخم فقط هي العوامل التي لها تأثير كبير على نمو الإيداعات. وتشير النتائج أيضا إلى أن العوامل المتمثلة في نسبة متانة رأس المال، والمخاطر الائتمانية، وحجم البنوك، وأسعار الفائدة وأوجه عدم اليقين المرتبطة بها لها آثار كبيرة على قروض البنوك التقليدية. لكن نسجل أيضا أن المتغيرات غير المتوقعة على مستوى أسعار الفائدة تؤثر إيجابا على قروض البنوك التقليدية. أما بخصوص البنوك الإسلامية، فإن العوامل المتمثلة في نسبة متانة رأس المال، والمخاطر الائتمانية، وحجم البنوك، ومعدل التضخم، وأسعار الفائدة كلها لها آثار كبيرة على القروض.

ABSTRAITE

Ce document examine les effets de l'inflation, du taux d'intérêt nominal et de leur incertitude sur les dépôts et les avances des banques conventionnelles et islamiques du Pakistan. L'objectif principal de ce document est d'examiner si les effets des deux types d'incertitude diffèrent pour les banques conventionnelles et islamiques. Pour effectuer l'analyse empirique, des données annuelles couvrant la période 2008-2015 pour un échantillon de 25 banques sont utilisées. Pour surmonter le problème de l'hétéroscédasticité de l'ensemble de données, la méthode d'estimation des moindres carrés généralisés (GLS) est appliquée. Nous constatons que le ratio d'adéquation des fonds propres, la taille des banques, le taux d'inflation, l'incertitude du taux d'inflation et l'incertitude des taux d'intérêt ont des répercussions importantes sur les dépôts des banques conventionnelles. Nous constatons également que si les variations inattendues du taux d'inflation ont des effets positifs, les variations inattendues du taux d'intérêt ont un effet

négalif sur les dépôts des banques conventionnelles. Dans le cas des banques islamiques, seuls le ratio d'adéquation des fonds propres, la taille de la banque et le taux d'inflation ont un impact significatif sur la croissance des dépôts. Les résultats révèlent également que le ratio d'adéquation des fonds propres, le risque de crédit, la taille de la banque, le taux d'inflation, le taux d'intérêt et son incertitude ont des répercussions importantes sur les avances des banques conventionnelles. Pourtant, nous montrons que les variations inattendues du taux d'intérêt ont un effet positif sur les avances des banques conventionnelles. En ce qui concerne les banques islamiques, le ratio d'adéquation des fonds propres, le risque de crédit, la taille de la banque, le taux d'inflation et le taux d'intérêt ont tous des répercussions importantes sur les avances.

Keywords: Bank Deposits, Bank Advances, Inflation Uncertainty, Interest Rate Uncertainty, Capital Adequacy Ratio, Islamic and Conventional Banks

JEL Classification: G20, G21

1. Introduction

Banks serve as financial intermediaries between depositors and lenders, collecting capital from depositors and lending it to end-users. Similarly, banks also facilitate business activities of corporations by crediting them and providing money in the form of advances. Deposits are the major source of funds for commercial banks. Thus, a bank's lending and investment decisions generally depend on the amount of deposits deposited to the bank. Usually, banks offer three types of deposits viz. demand deposits, saving deposits, and time deposits. These deposits fulfill the requirements of customers like saving purpose, earning income, and from an investment point of view, respectively (Haron & Azmi, 2006). In general, factors like the deposit interest rate, bank capital, bank size, and bank investment are considered major determinants of commercial banks' deposits. Likewise, macroeconomic factors such as interest rates, inflation, exchange rates, money supply, and the rate of economic growth are expected to have significant effects on bank deposit growth.

In principle, high-interest rates favorably affect bank deposits. People keep deposits with banks and banks pay a certain amount of interest or markup to their depositors. Generally, the time value of money concept

suggests that the main motive of customers to maintain deposits with conventional banks is to seek profits. However, Islamic banks (ISBs) follow the guidance of Shariah, and in Islam, interest or *riba* is prohibited. Therefore, ISBs do not practice any such activity that is based on interest. Therefore, ISBs take deposits in line with the principle of profit and loss sharing (PLS). Besides, ISBs do not restrain their clients to transfer their capital from ISBs to conventional banks (COBs) to gain high-profit rates on their deposits. Thus, to maintain the deposit level, ISBs manage the profit equalization reserve (PER) account. A certain portion of banks' total income is kept as a reserve in this account to facilitate depositors with a certain level of rate of return (Kasri & Kassim, 2009). Most of the empirical studies suggested that increased inflation adversely affects bank deposits. Higher inflation increases consumer expenditures and costs of living. To maintain their standard of living, people either take out money from banks or stop depositing money in banks. However, if the inflation rate is anticipated then banks adjust deposit rates to maintain the volume of deposits and consequently, they may reduce cash withdrawals (Siaw & Lawer, 2015).

Lending is the important function of commercial banks as banks provide advances to their customers, both individuals and business organizations, to carry out investment opportunities. Besides, banks also provide credits to the government to facilitate it to commence different development projects that may positively contribute to the growth of the economy (Olokoyo, 2011). Banks' capacity of providing loans depends on many factors like bank deposits, cash reserves, bank profitability, risk-taking behaviors, and lending rates. Macroeconomic factors such as inflation, GDP growth, and central bank policy rates may also have significant impacts on banks' loan decisions. Banks charge a certain amount of interest or markup on their loans and advances. Feldstein (1998) claimed that rising interest rates made it impossible for borrowers to repay the amount of outstanding loans that may lead to bank insolvencies. On the other hand, bank loans and advances are also affected by increased inflation. There is a general expectation that if the inflation rate increases more than the interest rate, then it may increase the demand for bank credits by compensating the effect of the increase in the nominal interest rate. Therefore, we can say that bank advances are directly associated with inflation rates.

Banks' role as a financial intermediary between depositors and debtors is an essential element of economic growth and development. Therefore, banks are considered as an important sector in a well-operating financial system. As an integral component of an economic system, the influence of macroeconomic conditions and their uncertainty on the banking system cannot be ignored. Macroeconomic uncertainty mainly affects the lending and investment decisions of banks, as due to uncertainties in inflation and interest rates, the returns on banks' investments and lending cannot accurately be predicted.

During periods of stable economic conditions, there exists information symmetry in banks, which helps them in making their decisions regarding investment, and thus, it is expected that their investment should be diversified. However, macroeconomic uncertainty adversely influences banks' investment and lending because inaccurate predictions on returns create difficulty for bank managers to make investment decisions (Baum *et al.*, 2009). Price instability worsens banks' lending strategies because it induces depositors to withdraw their funds. Withdrawals of deposits result in capital shortages and adversely impact banks' lending. Owing to uncertainties, banks generally hesitate to offer financing despite the prevailing of high-interest rates in the economy. For commercial banks, the key source of earnings is the income they generate through interest. Thus, high-interest rates or unpredictable, sudden, and huge variations in interest rates render banks' credit decisions and investment choices, adversary affecting the overall profitability of the banking industry.

In Pakistan, the banking industry comprises of two types of banking systems, conventional and Islamic banking. Conventional banking (CB) is interest-based banking, whereas, Islamic banking (IB) follows the principals of Shariah and is based on the mechanism of profit and loss sharing. IB in Pakistan is originated as a reaction to both spiritual and financial requirements. In Pakistan, there is an important role of the State Bank of Pakistan in the development and promotion of IB with the guidelines of Shariah and the authoritative framework. IB as of June 2016, the Islamic banking business observed the growth of 7.4% as its assets boost up to Rs.1,745 billion. Similarly, deposits of the IB industry raised by 9.3% with a share of Rs.1,461 billion. The overall profit achieved by the IB industry is Rs.6 billion by the end of June 2016 (Islamic Banking

Bulletin, June 2016)³. In Pakistan, given COBs' dominant position, the contribution of ISBs in the country's overall growth cannot be ignored. ISBs have proved their credibility and expanded their share of Pakistan's overall banking market. The latest estimates indicate the rise of IB in Pakistan's banking sector by about 12%.

Giving the growth prospects and emerging trends of IB, there is a need that the deposit growth and financing activities of ISBs vis-à-vis COBs would be investigated by considering the impact of macroeconomic indicators. The banking sector around the globe is facing a rapidly changing and competitive environment at the domestic and international levels. Deposits and lending decisions of banks are also influenced by the uncertain and unstable macroeconomic environment and market conditions of the country. In the existing literature, some studies have also been conducted to examine the determinants of deposits and advances of commercial banks. However, as per our knowledge, there is no study on the impact of inflation, real interest rates, and their uncertainty on the deposits and advances of COBs and ISBs of Pakistan. Therefore, in this paper, we examine the effects of the rate of inflation, the nominal interest rate, and their uncertainties on deposits and advances of COBs and ISBs of Pakistan. We also test the joint effect of both types of uncertainty on the underlying dependent variables. To carry out the empirical analysis, we use an unbalanced panel dataset for a sample of 25 banks including both COBs and ISBs operating in Pakistan during the period 2008-2015.

The contribution of the paper to the existing literature is twofold. First, most of the previous studies have focused on exploring the effects of inflation and interest rates on either bank deposits or bank loans and advances. However, departing from these studies, the main aim of the paper in hand is to investigate the effects of unexpected variations (volatility of) in the inflation rate and interest rates. Any empirical

³ *Islamic Banking Bulletin June 2016*. Islamic Banking Department, the State Bank of Pakistan.

<https://webcache.googleusercontent.com/search?q=cache:8J26e3KF-okJ:https://ceif.iba.edu.pk/pdf/islamic-banking-bulleting-jun2016.pdf+&cd=1&hl=en&ct=clnk&gl=pk>

examination of whether, when, and how banks take into consideration the uncertainty associated with both of these variables would be of great importance for enhancing our understanding on the empirical determinants of bank deposits and advances. Second, most of prior empirical investigations have examined the inflation and interest effects for the case of conventional commercial banks. Nevertheless, this paper expands the literature by investigating the effects of both types of uncertainty for Islamic *versus* conventional banks. Islamic banking is growing day-by-day and banking practices are carried out in dual banking system in most of Muslim and even in several non-Muslim countries. Given all this, it would be of great importance if the theoretically established and by default differential responses of both Islamic and conventional banks to any internal and external shocks is supported by empirical evidence.

The rest of the paper is structured as follows. The following section presents the literature review. The data and econometric methodology applied in the analysis are discussed in Section 3. The empirical results are displayed in Section 4 and some concluding remarks are given in Section 5.

2. Literature Review

2.1 Evidence on Bank Deposits

Deposits are considered as the principal origin of funds for the banking sector. The ability of banks to provide financing to the businesses to fulfill their capital requirements is mostly highly dependent on the amount of deposits, which the banks attract. In the past, many studies have been conducted to determine private saving behavior for a single country and cross-country comparison. Cardenas and Escobar (1998) examined the saving conducts in Colombia and determined that high administration expenses decrease national savings. The study also found a perfect correlation between savings and investment. Loayza and Shankar (2000) investigated the expansion of the private saving rate in India over the period 1960-1995. By applying the cointegration approach, the study found that saving rates are significantly affected by factors like the real interest rate, per capita income, the share of agriculture in GDP, inflation, the dependency ratio, and financial development.

Athukorala and Sen (2003) also investigated the factors of individual savings behavior in India during financial development, over the period 1954-1998. They considered income growth (IG), the rate of growth of population (GPOP), the real interest rate (RIR), real wealth, per capita income (PCI), inflation (INF), terms of trade (TOT), public saving to GDP rate (PS), bank density (BD), and remittances (REM) as determinants of private saving in India. The findings of their study revealed that IG, PCI, RIR, INF, TOT, PS, REM, and BD significantly affect savings.

Hondroyiannis (2004) analyzed individual saving behavior in Greece using data over the period 1961-2000 and found that fertility choice, the old-age dependency ratio, RIR, liquidity constraint, and public finances considerably affect the long-term saving behavior. Haron and Azmi (2006) investigated the structural determinants of commercial banks' deposits in Malaysia. Their study employed cointegration techniques on the data of both financial and economic factors like rates of profit of Islamic banks, deposits rates, lending rates, Kuala Lumpur composite index, money supply (MS), CPI, and GDP. They concluded that NIF and RIR both have adverse effects on bank deposits, whereas, the composite index and MS positively, significantly influence bank deposits.

Kasri and Kassim (2009) determined the factors of saving in Indonesian Islamic banks during 2000-2007. The results indicated the conventional interest rate as an important factor of savings in ISBs. Moreover, high rates of return and low-interest rates have a significant effect on the deposit growth of ISBs. The study also discovered that customers transfer their deposits from ISBs to COBs when return rates on savings in ISBs go down than COBs. Karim *et al.* (2014) analyzed and compared COBs and ISBs in terms of the impact of capital requirements on the growth of deposits and advances in 14 OIC countries from 1999-2009. Their study also considered the change in equity, liquidity, fee income, INF, and the change in real GDP in determining the deposits and advances for a total of 328 banks. The results indicated a highly positive association between capital adequacy and deposits and loan growth for both COBs and ISBs. Siaw and Lawer (2015) examined the impact of macro and financial variables on bank deposits in Ghana during 2000-2013. The results showed that INF and deposit interest rates have a negative influence on

bank deposits in the long run. In the short run, only INF and monetary policy rates found to be significantly impacted bank deposits.

Ergec and Arslan (2013) identified the effects of interest rates on the deposits and loans decisions of conventional and Islamic banks in Turkey for the period December 2005-July 2009. Estimating the vector error correction model the authors provided the evidence showing that Turkish banks' decisions regarding loans are significantly affected by interest rates. Similarly, it also appeared that the interest rate is significantly determining bank deposits during the examined period.

Adem (2015) studied the empirical determinants of the volume of bank deposits by utilizing the data on Commercial Bank of Ethiopia. The results of the study provided evidence of a positive, significant impact of deposit interest rate, the rate of inflation, GDP, and foreign remittances on bank deposits. Mashamba *et al.* (2015) examined the impact of deposit interest rates on deposit mobilization for banks operation in Zimbabwe during the period 2000-2006. The authors documented that interest rates have positive impacts on the amount of bank deposits during the period of the study.

Boadi *et al.* (2015) empirically examined the response of bank deposits to interest rate liberalization in Ghana by using the OLS estimation method. The results of the analysis provided evidence that a significant amount of variation in bank deposits is attributed to both interest rate liberalization and GDP of the country.

Hassan (2016) examined the impacts of interest rates on bank deposits for Nigerian banks. The authors found the significant and negative association between interest rates and the volume of deposits of commercial banks for the period 2000-2013. He also showed that the negative relationship between interest rates and bank deposits remained robust even after controlling the effects of GDP.

Ferrouhi (2017) analyzed the determinants of banks' deposits using the data of Moroccan banks for the period 2003-2004. The findings of the study revealed that bank size, interest rates, the rate of unemployment, and the inflation rate have significant effects on bank deposits. Nazib and Masih (2017) found that monetary policy shocks significantly affected

Malaysian Islamic banks' deposits. The results of the study also revealed that the effects of the inflation rate on bank deposits are also highly significant.

Raza *et al.* (2017) investigated how interest rates affect the savings and deposits of Pakistani commercial banks and other financial institutions for the period 2002-2016. The OLS regression results indicated that although the effect of the interest rate on bank deposits is positive, it negatively affects the savings of banks and other institutions included in the sample. Mushtaq and Siddiqui (2017) estimated the ARLD model in a panel framework to quantify the effects of interest rates on bank deposits for Islamic and non-Islamic countries for the period 1999-2014. The authors have documented significant evidence of no significant relationship between interest rates and bank deposits for Muslim countries. These findings hold for both short and long run. Quite the opposite, the results for non-Islamic countries revealed that interest rates are positively related to the volume of bank deposits.

Latheef and Masih (2017) investigated the asymmetries in the effects of macroeconomic indicators (interest rates, inflation, money supply, exchange rates, and trade balances) on deposits behavior in the Maldives. Their results showed that although all other macroeconomic variables have symmetric effects on deposits, the effects of interest rates are quite asymmetric both in the short run as well as in the long run. Naz *et al.* (2018) examined how monetary policy affects Islamic banks' deposits during the period 2008Q1-2017Q3. The empirical results of the study based on the ARDL model indicated that several macroeconomic variables such as interest rates, price levels, and money supply have significant effects on bank deposits.

Ünvan and Yakubu (2020) investigated the effects of several bank-specific variables on banks' deposits. Estimating the random effects models they found that the size of banks, the profitability of banks and the liquidity position of banks significantly determine the amounts of bank deposits. They further showed that the rate of inflation has a significant, negative impact on banks' deposits. Yet, they found that the capital adequacy ratio does not have any significant influence on bank deposits.

2.2 Evidence on Bank Advances

Banks earn interest income through providing loans to various sectors of the financial system including the private sector and public sector. Osayameh (1991) argued that the core objective of commercial banks' lending is to maximize their share of earnings. Banks take deposits from customers and utilize these deposits to grant financing in the form of advances or loans to other businesses and individuals, and thus, they increase their share of investments in the economy. Chernykh and Theodossiou (2011) explored the lending determinants of Russian banks for the year 2007 with 881 observations. By adopting the OLS estimation technique and HRM robustness test, the authors indicated that bank size, capitalization, and lack of long-term liabilities were the major, significant determining factors of commercial banks' lending towards businesses. In the context of Nigeria, Olokoyo (2011) investigated the factors that influence commercial banks' lending behavior. The study employed secondary data of 89 commercial banks for the period 1980-2005. The results indicated a significant, positive association between banks' credit and deposit volume, investment portfolio, yearly exchange rate, and gross domestic product. It was also revealed that bank deposits tremendously affect the lending behavior of banks.

Olusanya *et al.* (2012) explored the key aspects of Nigerian commercial banks' lending behavior over the period 1975-2010. They estimated the same model as employed by Olokoyo (2011). By using various econometric techniques, the results revealed a significant positive association between Nigerian commercial banks' advances and annual average exchange rate, GDP, deposits, and cash required reserves. However, the interest rate and investment portfolio both have negative influences on banks' lending.

Tomak (2013) aimed to explore the bank-specific and market-based indicators of the Turkish banking sector's lending behavior for the period 2002-2012. The empirical results suggested that the lending behavior of the Turkish banking sector was significantly and positively affected by the size, total liabilities, and the rate of inflation while the impact of non-performing loans on bank advances appeared to be negative. However, there was no impact of interest rate and GDP on banks' lending. Malede (2014) analyzed commercial banks' factors of lending in Ethiopia over

the period 2005-2011. By applying the Ordinary Least Squares (OLS) method, the study suggested that banks' lending was significantly and positively influenced by bank size, GDP, credit risk, and the liquidity ratio. Moussa and Chedia (2016) investigated commercial banks' credit factors in Tunisia during the period 2000-2013. The result suggested that return on assets, net interest margin, and the inflation rate significantly affected banks' lending.

Qayyum (2002) investigated the demand-side determinants of Pakistani banks' lending to corporate firms. They found a long-run cointegrating relation among the demand for bank credit, industrial output, RIR, and INF. Imran and Nishat (2012) examined bank credits' determinants for the period 1971-2008 for Pakistan. By applying the ARDL econometric approach, the study established a positive significant impact of domestic deposit, foreign liabilities, financial development, the exchange rate, and fiscal conditions on banks' lending towards the non-public sector. However, INF and money market rates both have no impact on banks' advances. Further, the authors found that both domestic deposits and private credits are independent at least in the short run.

Olokoyo (2011) explored the factors affecting the lending behavior of commercial banks in Nigeria during the period 1980-2015. The findings showed that the liquidity ratio, the cash reserve requirement ratio, the lending rate, and investment portfolios have significant effects on the lending decisions of banks.

Ayub and Javeed (2016) examined the role of capital adequacy ratio in determining financing behavior of Islamic banks in Pakistan for the period 2005-2014. The results of the panel model showed that a higher capital adequacy ratio has a significant, negative effect on Islamic banks' financing behavior. Another study by Lee (2016) determined the effects of macroeconomic factors on the lending decisions of Malaysian banks for the period 2005-2014. The author did not find any evidence in favor of the significant effects on GDP, interest rates, and cash reserves on bank lending decisions.

Baoko *et al.* (2017) estimating the ARDL model found that inflation, interest rates, money supply, and bank size have significant influences on

banks' decisions to expand their credits to private sector during the examined period. Timsina (2017) also examined the lending behavior of banks operating in Nepal during the period 1975-2014. The author pointed out that inflation, interest rates, liquidity ratios, and GDP are significant in determining the credit supply decisions of banks. Rashid and Khalid (2017) investigated the impacts of inflation and real interest rate uncertainty on Islamic and conventional banks' performance and solvency in Pakistan during the period 2008-2015. The GLS results suggested that over and above the bank-specific determinants, both types of uncertainties have significant influences on bank performance and solvency. Yet, the results showed that the effects are quite different for Islamic and conventional banks.

Balago *et al.* (2018) examined the influence of several monetary policy instruments on the lending behavior of banks. Along with several other findings, the study has reported a negative effect of the interest rate on banks' lending decisions. However, the results revealed that exchange rates are positively related to lending. Akani and Oparaordu (2018) explored the factors including macroeconomic variables and monetary policy instruments that affect the credit decisions of Nigerian commercial banks. The authors found that both deposit liabilities and the liquidity ratio affect banks' loans and advances positively. However, they found that deposit rates and banks' total branches significantly, negatively affect loans and advances. Estimating another specification, they showed that both exchange rates and the inflation rate have significant positive impacts on the total amount of loans and advances of commercial banks

Noor and Ali (2018) examined the response of bank deposits to the tax imposed on bank withdrawals in 2006. They found that the imposition of bank withdrawal taxation in Pakistan has significantly reduced bank deposits during the examined period (2006-2014). Bhattarai (2019) examined how the lending operations of banks operating in Nepal are affected by bank-specific and external factors. The findings of the study confirmed that while both exchange rates and inflation rate have positive effects, interest rates have negative effects on loans and advances.

Recently, Yumusa *et al.* (2020) using time series data for the period 1980-2018 studied the determinants of bank lending for the case of Nigerian banks. The findings of the study provided strong evidence of the negative effects of both inflation and interest rates during the period under

investigation. However, exchange rates have positive effects on total bank loans and advances. Another recent study by Ibenyenwa (2020) pointed out that commercial banks' credit ratios significantly respond to various types of interest rates and risk premium in both long and short run. Further, the study documented that reductions in the interest rate significantly improve the credit supply capacity of both Nigerian as well as South African banks.

More recently, Rashid *et al.* (2020) investigated how monetary policy affects the credit supply decisions of Islamic and conventional banks in Malaysia for the period 2005-2016 by applying the system GMM estimator. The authors found that the effects of interest rates are negative and significant on credit expansion. However, the results also confirmed that these negative effects are considerably less in Islamic banks than their conventional counterparts. Finally, the findings suggested that small-sized banks and less-liquid banks are more affected by changes in interest rates.

In an early study, Rashid and Shah (2019) investigated the effects of tight monetary policy on the financing decisions of Islamic and conventional banks in Pakistan for the period 2005-2016. The results of the study suggested that although both types of banks significantly reduces their financing during the periods when interest rates are higher, Islamic banks do so less. Finally, the results revealed that large-sized banks and more-liquid banks' credit supply decisions are less affected by increased interest rates.

3. Empirical Methodology

3.1 Empirical Models

3.3.1 Bank Deposits Model

In the following model, customer deposits are used as a dependent variable to estimate the influence of different bank-specific and macroeconomic variables and their uncertainty on the deposits of conventional and Islamic banks.

$$Deposits_{it} = \beta_1 + \beta_2 CAR_{it} + \beta_3 DIR_{it} + \beta_4 BS_{it} + \beta_5 INF_t + \beta_6 NIR_t + \beta_7 UN_t^{INF} + \beta_8 UN_t^{NIR} + \mu_{it} \quad (1)$$

where i presents ith bank at year t , μ_{it} shows the residuals. Bank deposits are independent variables. CAR_{it} is the dependent variable that shows the capital adequacy ratio. Deposit interest rate (DIR_{it}), BS_{it} represents bank size, INF_t reflects the rate of inflation and NIR_t shows the nominal interest rate, UN_t^{INF} is inflation uncertainty and UN_t^{NIR} is nominal interest rate uncertainty at year t . The CAR_{it} and BS_{it} are taken from the model estimated by Karim *et al.* (2014), whereas, DIR is taken from the model estimated by Siaw and Lawer (2015). INF_t and NIR_t are taken from the model estimated by Finger and Hesse (2009). Their study, however, used interest rate differentials as a proxy for the interest rate.

3.3.2 Bank Advances Model

In this model, customer advances are used as the dependent variable to examine the effect of different bank-specific, macroeconomic determinants, and their uncertainty on banks' advances/ financing.

$$Advances_{it} = \beta_1 + \beta_2 CAR_{it} + \beta_3 VD_{it} + \beta_4 CRR_{it} + \beta_5 CR_{it} + \beta_6 BS_{it} + \beta_7 INF_t + \beta_8 NIR_t + \beta_9 UN_t^{INF} + \beta_{10} UN_t^{NIR} + \mu_{it} \quad (2)$$

where $Advances_{it}$ are the advances of bank i at year t used as the dependent variable. The independent variables are VD_{it} (Volume of deposit), CRR_{it} (cash required reserve), CAR_{it} (capital adequacy ratio), CR_{it} (credit risk), BS_{it} (bank size), INF_t (inflation), NIR_t (nominal interest rates), UN_t^{INF} (inflation uncertainty), and UN_t^{NIR} (real interest rate uncertainty) for each bank i at each year t . These macroeconomics indicators and bank-specific variables are taken from the model estimated by Moussa and Chedia (2016), Malede (2014), and Olusanya *et al.* (2012).

3.2 Variable Description

Table 1 represents the description of the macroeconomics and bank-specific variables.

Table 1: Description of Bank-specific and Macroeconomic Variables

Dependent Variables		Description
	Deposits	Bank deposits are considered as the most secure and liquid financial assets of a bank, which can increase banks' credit to a variety of sectors. Customer deposits are the basic source of bank loans (MacCarthy <i>et al.</i> 2010). $\text{Deposits} = (\text{Deposits}/\text{Total Assets}) \times 100$
	Advances	Advances are the main source of banks' income. Advances/ loans are the amounts of money lend by the bank to its customers with an agreement to return that loan within a specified time (Malede, 2014). $\text{Advances} = (\text{Loans}/\text{Total Assets}) \times 100$
	Capital Adequacy Ratio (CAR)	Capital adequacy ratio is an important measure of banks' profitability and capital strength. Higher capital adequacy ratios are reflected low leverage and therefore lower risk and higher revenue (Naceur & Khalid, 2009). $\text{CAR} = [(\text{Tier 1 Capital} + \text{Tier 2 Capital})/\text{Total Assets}] \times 100$

Bank-Specific Variables	Volume of Deposits (VD)	Deposits are a key source of money for a bank as they should be deposited to raise income. Deposits/Total Assets ratio calculates measures the volume of deposits a bank receives in the proportion of its scale (Acaravci & Calim, 2013). $VD = (\text{Deposits/Total Assets}) \times 100$
	Credit Risk (CR)	Credit risk is defined as the danger posed by the bank when the borrower does not recoup the sum of credit /loan provided. The bank is making rules against these loans. Credit risk adversely impacts bank efficiency (Ali <i>et al.</i> , 2011). $CR = (\text{Loan Loss Provisions/Gross Loans}) \times 100$
	Bank Size (BS)	Mostly, in the finance literature, the total assets of a bank are considered as a substitute for bank size. Bank size is also a measure of bank lending decisions (Berger & Udell, 2006). $\text{Bank Size} = \ln (\text{Total Assets})$
Macroeconomic Indicators	Deposit Interest Rate (DIR)	Deposit interest rate is the amount of money paid out in interest/ profit by a bank on the principle amount taken as deposits. Banks pay deposits interest rates on savings and other investment accounts.
	Cash Required Reserves (CRR)	The cash reserve requirement ratio is defined as the proportion of banks' cash reserves to the overall assets of the bank. Cash reserve is the amount that the bank kept with the central bank or other banks to meet its credit requirements. $CRR = (\text{Cash Required Reserves/Total Assets}) \times 100$
	Inflation Rate (INF)	INF is defined as the continuing rise in the level of accessible goods and services prices. It is determined by taking the percentage change annual consumer price index (Kanwal & Nadeem, 2013).
	Nominal Interest Rate (NIR)	NIR is the call money rate. The call money rate is the interest rate on a form of temporary loan provided to brokers by the banks. In exchange, the brokers lend the capital to creditors to finance marginal accounts call money rate is the cost dictated by the government and it greatly influences the deposits, advances, etc. of the bank.
Uncertainty	Inflation Rate Uncertainty (UN_t^{INF})	Inflation rate uncertainty is defined as the unexpected variation in the rate of inflation over time and it is measures by the 12-month standard deviation of the inflation rate.

	Interest Rate Uncertainty (UN_t^{NIR})	Interest rate uncertainty is defined as the unexpected variation in the level of interest rate over time and it is measured by the 12-month standard deviation of call money rate.
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3.3 Data

We used a sample of 25 banks that includes both large and small banks of Pakistan. For our research, we assembled data of 20 COBs and 5 ISBs from the period of 2008-2015. We have a total of 200 observations, in which COBs' observations are 160 and ISBs' observations are 40. Secondary annual balanced panel data for bank-specific variables were obtained from selected banks' combined annual financial statements from their official websites. However, data for deposit interest rates are taken from World Bank Indicators (WDI). Monthly data of consumer price index (CPI) and call money rates are collected from IMF's International Financial Statistics (IFS) database.

3.4 Estimation Technique

We started by calculating the required financial ratios of bank-specific variables. The uncertainty of macroeconomic indicators is measured by calculating the 12-month standard deviation (SD) using monthly data of INF and NIR. After that, we merged the bank-specific variables with the values of the standard deviation of INF and NIR. For testing heteroskedasticity in the data, we applied the Breusch Pagan/Cook Weisberg test. The Breusch Pagan/Cook Weisberg test checks the linear form of heteroskedasticity. To implement the test, we estimated the models by employing the technique of ordinary least square (OLS). Breusch Pagan test is the chi-squared test and test the null hypothesis of homoscedasticity. If the value of chi-squared is greater than the critical value at any acceptable significance level, then the null hypothesis of homoscedasticity is rejected and the alternate hypothesis of heteroskedasticity is accepted.

The results of almost all the test statistics appeared to be significant which evidenced the presence of heteroskedasticity in the data. Therefore, to control heteroskedasticity, we used the Generalized Least Square (GLS) method for estimating the empirical models. The GLS method is more

efficient than OLS in the presence of heteroskedasticity or autocorrelation.⁴ At last, we applied the linear parametric restriction test to test the joint significance of the macroeconomic indicators included in the specification. First, we estimated our models for the full sample, then, for the comparison purpose, we estimated the same models for COBs and ISBs separately.

4. Regression Results

4.1 Breusch Pagan Test/Cook Weisberg Test

Breusch Pagan/Cook Weisberg test is commonly used to check the presence of heteroskedasticity in the model. It is implemented by considering that heteroskedasticity can be a linear function of all the independent variables in the model to be estimated.⁵ The significance of the test statistics provides evidence of the presence of heteroskedasticity. Therefore, it rejects the null hypothesis of homoscedasticity. We applied the Breusch Pagan/Cook Weisberg test to check heteroskedasticity. The results presented in Table 2 of these tests provide evidence of the presence of heteroskedasticity in panel data.

Table 2: Results of Breusch Pagan/Cook Weisberg Test

Deposits	$Chi^2 (1) = 3.77$ $Prob > Chi^2 = 0.0521$
Advances	$Chi^2 (1) = 0.61$ $Prob > Chi^2 = 0.4253$

⁴ Baltagi, B. H. (2008). *Econometrics* (4th ed.). New York: Springer
Generalized Least Squares Pages: 223-239.

It can be observed from the table that the p-value of the deposits' model is 0.045 and for the advances' model is 0.001, indicating significance at the 5% and 1% level, respectively. The significance of the statistics confirms the presence of heteroskedasticity in the models. To deal with the problem of heteroskedasticity, we applied the generalized least squares (GLS) estimation method. The values of Wald Chi^2 are presented in each table and all Wald Chi^2 values have a probability of 0.0000 for each model. The Wald Chi^2 suggests that if the probability is lower than 0.05, it illustrates that all the estimated coefficients are statistically not equivalent to zero. It also recommends that all the considered variables considerably contribute to enhancing the good fit of the model.

⁵ Breusch Pagan Test

<http://www.dummies.com/education/economics/econometrics/the-role-of-the-breusch-pagan-test-in-econometrics/>

Further, we applied a linear parametric restriction test on the coefficient of SD of INF and the SD of NIR. We carried out this test by applying linear restrictions on the parameters of these variables and the estimated values suggested that both inflation rate uncertainty and real interest rate uncertainty should be a part of the model.

4.2 Results and Discussion of Bank Deposits Model

In Table 3, we presented the empirical results of bank-specific and macroeconomic indicators. The negative estimate of the capital adequacy ratio indicates that increases in banks' capital adequacy ratio decrease the level of banks' deposits. Our results are inconsistent with the results of Schmitz (2007) and Karim *et al.* (2014). Their studies reported a positive relationship between bank deposits growth and capital requirements. The deposit interest rate appears to affect bank deposits with a negative sign but the result is insignificant. Our results are consistent with the results of Eriemo (2014). The coefficient of bank size is statistically insignificant with a positive sign. This means that large bank size has no significant impacts on banks' deposits growth.

The rate of inflation is positively related to banks' deposits and is statistically significant at the 10% level of significance. This means that bank deposits grow with the inflation rate. The estimated coefficient of

NIR indicates a negative but statistically insignificant relationship with banks' deposits. There is a general perception that banks attract more deposits with an increase in the interest rate. However, our result suggests that the interest rate is not a major reason for customers keeping their deposits with the banks, at least in the period we examined in this study.

Although the finding of the negative effect of interest rates on bank deposits is not consistent with the traditional banking theory, it can be justified in several ways. First, one should note that several other studies on Pakistan such as Hassan (2016), Raza *et al.* (2017), and Mushtaq and Siddiquie (2017) have also documented the negative and statistically significant impact of the interest rate on bank deposits using different techniques and different sample periods. Latheef and Masih (2017) have also shown the negative relationship between interest rates and bank deposits. Thus, our findings are consistent with the findings of the previous existing studies on Pakistani banking sector. Second, the negative effect of interest rates on bank deposits can be rationalized as follows. In Pakistan, the interest rate is generally set higher to control inflation. Therefore, during periods of higher inflation, individuals either withdraw their deposits from the banks or, at least, deposit less amounts to maintain their purchasing power. This leads to reductions in total bank deposits despite of the monetary authority has set higher interest rates to curb the inflationary pressures in the economy. Another reason of the negative effect of the interest rate on bank deposits is that during episodes of higher interest rates, the opportunity cost of keep demand deposits has increased. Therefore, individuals may prefer to investment in other saving schemes such as National Saving Certificates and do investments in non-banking financial institutions such as mutual funds and insurance companies. This will also reduce the total volume of bank deposits. Similarly, the imposition of taxation of bank withdrawals is also one of the major reasons of the reduction in bank deposits.

One of the reasons of lacking the significant link between interest rates and bank deposits can be the motive of savings. In the country like Pakistan having the characteristics such as the majority of Muslim population, financial, economic, and political uncertainty, low financial literacy, low outreach and less financial inclusion, unavailability of attractive financial instruments, complicated banking procedure, and banks offering very low deposit rate despite higher policy rate, most of

people generally keep deposits with the banks for future requirements rather than really with the intentional of earning interest/return. Given this context, it is very likely the deposits of banks would be very less sensitive to changes in the interest rate.

Finally, in episodes of higher interest rates, informal credit markets may be flourished in Pakistan as banks charge higher interest rates on financing. Therefore, individual may find profitable and easy to lend in the informal credit market rather than to deposit into banks. This attitude of individuals will also cause reductions in the total amount of bank deposits during the periods of higher interest rates in the economy.

The coefficient of inflation uncertainty (SD of inflation) reveals that inflation rate uncertainty is positively, significantly related to banks' deposits. This implies that increased inflation uncertainty results in higher banks' deposits. The impact of the inflation rate on banks' deposits depends on whether the rate of future inflation is anticipated or not (Revell, 1979). When the inflation rate is anticipated then banks are able to adjust prices and interest rates. Thus, it is presumed that there will be a positive relationship within anticipated inflation and bank deposits and a negative association between unanticipated inflation and bank deposits. The coefficient of real interest rate uncertainty (SD of interest rates) is negative, suggesting that it negatively affects bank deposits. This means that unexpected variations in NIR decrease banks' deposits. Finally, we apply a linear parametric restriction test. The value of Chi^2 is 0.000, which is significant at the 1% level of significance. This means that both the SD of inflation and the SD of interest rates significantly contribute toward the prediction and fitness of the model. Therefore, these two variables should be included in the model.

Table 3: Regression Results for Bank Deposit Model

Empirical Results for Panel Data (Generalized Least Squares)			
Variables	Full Sample	Conventional Banks	Islamic Banks
Capital Adequacy	-0.503***	-0.379***	-0.465***
Ratio (CAR)	(0.06)	(0.06)	(0.14)
Deposit Interest	-0.073	0.323	-2.017
Rate (DIR)	(0.65)	(0.65)	(2.18)
Bank Size (BS)	0.418	1.437***	4.560***
	(0.36)	(0.43)	(1.27)

Inflation Rate (INF)	1.054* (0.60)	1.198* (0.62)	2.883* (1.71)
Nominal Interest Rate (NIR)	-0.458 (0.45)	-0.435 (0.47)	1.902 (1.30)
SD Inflation (UN_t^{INF})	8.873*** (1.61)	8.486*** (1.71)	5.841 (4.08)
SD Interest Rate (UN_t^{RIR})	-3.339*** (0.79)	-2.501*** (0.84)	-2.092 (2.02)
Constant	74.657*** (9.39)	47.236*** (10.83)	-6.034 (31.17)
Wald Chi2	108.829	76.820	93.855
Prob. > Chi2	0.0000	0.0000	0.0000
Linear Parametric Restrictions			
(1) SD_INF = 0			
(2) SD_Real Interest = 0			
chi2 (2)	30.29	26.54	2.06
Prob > chi2	0.0000	0.0000	0.3571

Note: * indicates significant at 10% level, ** indicates significant at 5% level, and *** indicates significant at 1% level.

In the case of conventional banks, except the deposit interest rate, all the other bank-specific variables have significant effects on banks' deposit growth. Our results for deposit interest rates are consistent with the results of Siaw and Lawyer (2015). The coefficient of the inflation rate is positive and statistically significant. The estimate of the real interest rate is negative and statistically insignificant. The coefficient of inflation uncertainty is statistically significant with a positive sign. This means that increases in the unexpected variation in the future direction of inflation increase the banks' deposit volume. On the other hand, the coefficient of NIR uncertainty appears to be negative and statistically significant. This indicates that increases in the unexpected variation in the future direction of interest rate decrease the banks' deposits volume. In the last, we applied a linear parametric restriction test. The value of Chi^2 is 0.000, which is significant at the 1% level of significance. It means that the SD of inflation and the SD of nominal interest rates are a good contribution towards the prediction and fitness of the model. So, these variables should be the part of the model.

In the case of ISBs, except for the deposit interest rate and the real interest rate, all the other variables have significant coefficients. The calculated

coefficients of NIR and its uncertainty are positive but statistically negligible. This means that they do not have any significant impact on ISBs' deposit growth. In the last, a linear parametric restriction test is conducted to test the joint significance of the SD of inflation and SD of the nominal interest rate. The value of Chi^2 is 0.35, which is statistically insignificant. Hence, the results suggest that these two variables should not be a part of the model.

4.3. Results and Discussion of Bank Advances Model

In Table 4, we presented the empirical results for the banks' advances model. The coefficient of the capital ratio shows a negative sign with bank advances and it appears significant at the 1% level of significance. This means that an increase in banks' capital decreases banks' capacity to give advances. Our results are in line with the findings of Rababah (2015) that also indicated the negative relationship between capital and banks' lending. Nevertheless, their results were not statistically significant. The study of Berrospide and Edge (2010) revealed that the relationship between the capital adequacy ratio and banks' lending is the key point to determine the relationship between financial conditions and banks' real activities.

The volume of the deposit is negatively related to banks' advances but the estimated value of the coefficient is not statistically significant. Our results are consistent with the results of Malede (2014), Mac Carthy *et al.* (2010), and Sebastian (2009). The estimated coefficient of the variable cash required reserves is statistically significant with a positive sign. This means that increased banks' reserves with treasury banks will increase the banks' ability to grant financing to its customers. Our findings are well matched with the findings of Malede (2014) and Meltzer (2003). However, the findings of their studies revealed an insignificant relationship between cash reserve requirements and banks' credit behavior. The coefficient of credit risk is statistically significant with a negative sign. This implies that increases in the level of credit risk decrease the banks' level of financing to customers and businesses. Our results are inconsistent with the results of Malede (2014) that reported a positive relationship between bank lending and credit risk. The result of bank size indicates that bank size has a negative sign and appears statistically significant at the acceptable level of significance. This means

that bank size decreases the level of banks' advances. Our findings are related to the findings of Berger and Udell (2006) but inconsistent with the findings of Malede (2014), Tomak (2013), and Chernykh and Thedossiou (2011).

The estimate of the inflation rate is positive and statistically insignificant, suggesting that the rate of inflation has positive but weak impacts on banks' advances. The results of the inflation rate are inconsistent with the results of Yigit (2000) but consistent with the results of Moussa and Chedia (2016). We can observe from the table that the coefficient of RIR is statistically significant with a positive sign. The significant estimate of the real interest rate shows that the real interest rate has a strong impact on banks' credit/advances. The estimate of inflation uncertainty is positive but the results are insignificant, suggesting that the uncertainty related to the rate of inflation has a weak impact. Yet, in the literature, studies like Yigit (2000) have documented the significant impact of inflation uncertainty on credit markets. The findings indicated that the unanticipated rate of inflation increases the interest rate, decreases the credit supply, and thus, positively influences the loan demand. The coefficient of real interest rate uncertainty is significant with a positive sign at the 1% level of significance. This means that increased uncertainty about future interest rate will also increase banks' capacity to grant financing. In the last, a linear parametric restriction test is conducted. The estimated value of χ^2 is considerably greater than the critical value at the 1% level, suggesting a rejection of the null hypothesis. The rejection of the null hypothesis implies that both inflation uncertainty and interest rate uncertainty are considerably contributing to the good fit of the model.

Table 4: Regression Results for Bank Advances Model

Empirical Results for Panel Data (Generalized Least Squares)			
Variables	Full Sample	Conventional Banks	Islamic Banks
Capital Adequacy Ratio (CAR)	-0.428*** (0.07)	-0.445*** (0.08)	-0.250** (0.13)
Volume of Deposits (VD)	-0.050 (0.05)	-0.007 (0.06)	-0.020 (0.16)
Cash Required Reserves (CRR)	0.143** (0.07)	0.105 (0.07)	0.365 (0.52)
Credit Risk (CR)	-0.146* (0.08)	-0.180* (0.10)	-0.283* (0.16)

Bank Size (BS)	-2.189*** (0.47)	-2.015*** (0.53)	-6.730*** (1.40)
Inflation Rate (INF)	3.114*** (0.59)	3.967*** (0.64)	-4.075*** (1.10)
Nominal Interest Rate (NIR)	1.840*** (0.47)	2.422*** (0.51)	-3.039*** (0.89)
SD Inflation (UN_t^{INF})	0.384 (2.06)	0.767 (2.20)	-3.184 (3.17)
SD Interest Rate (UN_t^{NIR})	4.672*** (1.07)	5.295*** (1.15)	-0.419 (1.77)
Constant	68.735*** (12.76)	55.623*** (14.94)	206.345*** (26.52)
Wald Chi2	150.174	161.910	88.570
Prob. > Chi2	0.0000	0.0000	0.0000
Linear Parametric Restrictions			
(1) SD_inf = 0			
(2) SD_realrate = 0			
chi2 (2)	50.48	56.74	3.10
Prob > chi2	0.0000	0.0000	0.2121

Note: * indicates significant at the 10% level, ** indicates significant at 5% level, and *** indicates significant at 1% level.

In the case of COBs, almost all the bank-specific variables and macroeconomic indicators are statistically significant except the volume of deposits and cash required reserves. The coefficient of inflation uncertainty appears to be positive and statistically insignificant, which means that inflation uncertainty has no impact on COBs' advances. The estimated coefficient of the real interest rate is significant with a positive sign at the 1% level. This shows that the real interest rate uncertainty has an adverse influence on COBs' advances. In the last, a linear parametric restriction test is applied. The p-value of Chi^2 is 0.000, indicating the rejection of the null hypothesis, which implies that both types of uncertainty should be included in the specification of the model to enhance the prediction power of the model. It depicts that the SD of inflation and the SD of nominal interest rates significantly contribute to the model's prediction and fitness.

For ISBs, both types of bank-specific and macroeconomic indicators represent the same degree of sign and importance as COBs. However, the coefficient of inflation uncertainty and the uncertainty of the real interest rate is negative and statistically insignificant, which implies that there is

no impact of unexpected variation of the interest rate and rate of inflation on ISBs' advances. In the last step, the linear parametric restriction test on the coefficient of the SD of nominal interest rate and inflation. The χ^2 value of this test is 0.212 that indicates that these variables do not have any significant contribution to the good fit of the model.

5. Conclusions

This study looks at the impact of real interest rates, the rate of inflation, and their volatility on deposits and advances of Islamic and conventional banks in Pakistan. The paper's key objective is to determine whether the impacts of inflation uncertainty and interest rate uncertainty on bank deposits and advances are different for COBs and ISBs. For the empirical analysis, annual data covering the time period 2008-2015 for a sample of 25 banks are used. To overcome the problem of heteroskedasticity in the dataset, the GLS estimation method is used.

The results of the conventional banks' deposit model suggest that the capital adequacy ratio, bank size, the rate of inflation, inflation rate uncertainty, and real interest rate uncertainty all have significant influences on COBs' deposits. These findings suggest that COBs should improve its capital structure to increase deposits. Large COBs are well diversified and attract more customer deposits. The rate of inflation is considered as an important determinant for COBs' deposit growth. Also, unexpected variations in the rate of inflation have positive impacts on COBs' deposits, whereas, unexpected variations in NIR adversely affect COBs' deposits. On the other hand, In the case of ISBs, only the capital adequacy ratio, bank size, and the inflation rate have significant impacts on deposit growth.

The results of COBs' advances model reveal that the capital adequacy ratio, credit risk, bank size, INF, NIR, and the interest rate uncertainty all have significant impacts on COBs' advances. The findings suggest that COBs should improve its capital structure to increase financing. Non-performing advances have a bad influence on the capability of COBs to provide funding to customers and other business segments. The diversification and larger bank size have negative impacts on COBs' advances.

5.1 Policy Implications

COBs can accurately predict inflation and adjust the interest rate appropriately, which increases their potential for advances. High real interest rates can have a beneficial impact on advances created by COBs. Moreover, the sudden variability of the actual interest rate has a favorable impact on conventional bank advances. For Islamic banks, credit risk, the capital adequacy ratio, the inflation rate, bank size, and the real interest rate have a significant impact on the advances made by Islamic banks.

Like COBs, ISBs should also improve their capital structure and control bad financing to enhance their stability. ISBs are well diversified and have more accessibility to customers and businesses and this increases their capacity to provide advances. Unlike, COBs, ISBs should increase their potential to anticipate inflation precisely and to make proper adjustments of returns on their advances, accordingly. We also observe that higher interest rates decrease ISBs' ability to provide credits/financing. Therefore, ISBs should design effective and appropriate strategies to minimize the adverse effects of increased interest rates. Since bank deposits are insensitive to interest rates, there is a dire need to design some other types of effective strategies and develop attractive financial products to attract deposits.

There is also a need to minimize unpredictable and sudden fluctuations in both inflation and interest rates to attract bank deposits and enhance bank loans and advances to facilitate the growth process in the country. There is also a need to design an appropriate monetary policy, which should not only help to reduce uncertainty associated with interest rates and the rate of inflation but also devise such instruments that are equally helpful and suitable to cater the requirements and needs of both Islamic and conventional banks.

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