KER
Kashmir Economic Review
Since 1984

KASHMIR ECONOMIC REVIEW

Volume 29, Issue 2 **December 2020**

ISSN (Print): 1011-081X **ISSN (Online): 2706-9516**

Articles

Kashmir Institute of Economics
University of Azad Jammu and Kashmir, Muzaffarabad, Pakistan
www.ker.org.pk

Kashmir Economic Review
ISSN(P): 1011-081X, ISSN(E): 2706-9516
http://www.ker.org.pk

Kashmir Economic Review (KER) is published biannually by Kashmir Institute of Economics in the spring and autumn since 1984. The Editorial Board is responsible for the final selection of the content of the journal and reserves the right to reject any material deemed inappropriate for publication. Articles presented in the journal do not represent the views of the University of Azad Jammu & Kashmir. Responsibility for the opinions expressed and the accuracy of facts published in articles and reviews rests solely with the author(s).

Correspondence

All correspondence should be directed to the Managing Editor.
Email: m.jamil@ajku.edu.pk; managing.editor@ker.org.pk
Phone: +92-331-2331079
Postal Address: Dr. Muhammad Jamil, Managing Editor, Kashmir Economic Review (KER), Kashmir Institute of Economics, University of Azad Jammu & Kashmir, King Abdullah Campus, Muzaffarabad, Pakistan.

Copy Rights

Indexing and Listing

HEC Recognized, Category "Z"

Subscription Rates

Pakistan	**South Asian Countries**
Pak Rs. 300 a copy	Pak Rs. 600 a copy
Pak Rs. 500 a year	Pak. Rs. 1000 a year
Other Countries	
US$ - 20 a copy	US$ - 30 a year

Kashmir Economic Review
ISSN(P): 1011-081X, ISSN(E): 2706-9516
http://www.ker.org.pk

Editorial Board

Kashmir Economic Review
ISSN(P): 1011-081X, ISSN(E): 2706-9516
http://www.ker.org.pk

Advisory Board

Disclaimer

The contents of this "journal" are writers' personal views. The statements, facts and opinions by the authors in the Kashmir Economic Review do not imply the official policy of the Kashmir Institute of Economics or university of Azad Jammu & Kashmir or editors.

Kashmir Economic Review
ISSN(P): 1011-081X, ISSN(E): 2706-9516
http://www.ker.org.pk

Contents

Kashmir Economic Review, Volume 29, Issue 2, December 2020

Kashmir Economic Review
ISSN(P): 1011-081X, ISSN(E): 2706-9516
http://www.ker.org.pk

Modelling Dynamics of Sen's Capability Dimensions: A New Approach

ABSTRACT

Sen (1999) introduced dynamics into the capability approach in his book "Development as Freedom". There has been hardly any work, except for Pugno (2017), on capability dynamics since then. The study of Pugno (2017) is theoretical and does not derive policy implications in terms of freedom, functioning, and conversion efficiency. The lack of empirical work in this area is largely due to the unavailability of panel data at the household or individual level to study dynamics. To solve this problem, we have developed a methodology based on bootstrapping to study the dynamics of data available at a point in time. We then apply this methodology to explore the dynamics of capability dimensions in various policy scenarios using district-level data from the Pakistan Socio-Economic Survey (PSES, 2002). First, we measure sense-of-achievement, sense-of-freedom-to-achieve, and sense-of-ability-to-achieve to quantify Sen's functioning, freedom, and conversion efficiency for the overall functioning of "being achieved". Most districts (61.4%) are found to fall in the policy region where it is required to focus on freedom with the increasing emphasis on efficiency as functioning increases. It means that freedom provides a precondition for efficiency and functioning in these districts. Further, a comparison of HDI with capability dimensions at various policy focus regions reveals that the level of HDI does not alter the policy focus region. It means that human development has no correspondence with capability dimensions. Hence a separate focus is required to enhance capability dimensions.

AUTHORS

Hamid Hasan
Assistant Professor, IIIE,
International Islamic University
Islamabad, Pakistan
Author's Contributions: 1, 3, 4, 6
hamidhassan@iiu.edu.pk
https://orcid.org/0000-0002-7078-3720

Hayat Khan
Assistant Professor, College
of Business, Alfaisal University,
Saudi Arabia
Author's Contributions: 6, 7
hakhan@alfaisal.edu.sa
https://orcid.org/0000-0002-1959-0640

Malik Muhammad *
Assistant Professor, IIIE,
International Islamic University
Islamabad, Pakistan
Author's Contributions: 2, 7
malikmuhammad@iiu.edu.pk
https://orcid.org/0000-0002-7798-6440

Keywords
Freedom; Efficiency; Functioning; Human Development; Bootstrapping

JEL Classification
C15, C50, O15

Please cite this article as:
Hasan, H., Khan H., & Muhammad, M. (2020). Modelling dynamics of Sen's capability dimensions: A new approach, *Kashmir Economic Review*, 29(2), 1-13.

*** Correspondence author**

Author's contribution in the article: 1- Conceived and designed the analysis, 2- Reviewed and compiled the literature, 3- Collected the data, 4- Contributed data or analysis tools, 5- Performed the analysis, 6- Wrote the paper, 7- Financial support for the conduct of the study, 8-Other

1. INTRODUCTION

Measuring well-being has been one of the challenging topics in economics. Initially, economists used material-based indicators, like Gross Domestic Product (GDP), as measures of well-being. Although there is a lot of criticism on GDP, it is being used as a measure of human well-being because of its simplicity (Hasan and Khan, 2015). Mahbub ul Haq proposed a human development index (HDI) as an alternative to GDP to measure human well-being. After 1990, economists shifted their thinking to people-centered development instead of material-centered.[1] For example, Stiglitz *et al*. (2009) emphasize measuring the wellbeing of people instead of measuring economic production.

Sen (1985b) criticises material-based assessment approaches of well-being as these approaches do not consider diversity rather assume homogeneity of human being and are focusing on what individuals possess or reveal to prefer rather on an individuals' abilities or disabilities. Further, these approaches do not show the true well-being of the individuals in terms of possessions and preferences rather are subject to adaptability, i.e., individuals adjust to their circumstances. Sen (1984, 1985a, 1985b, 1987a, 1987b, 1990, 1992, 1993, 1999) was the pioneer of the capabilities approach. Later, Nussbaum (2000, 2005) further developed the capabilities approach.[2] The capabilities approach is a normative framework to assess the social arrangements and wellbeing of an individual and to design policies for social change and justice. It revolves around three main concepts, functioning, conversion efficiency, and freedom, required for justice and measurement of well-being. Besides, means (resources) and conversion factors are two other concepts that interact with functioning, freedom, and conversion efficiency.

Sen (1999) in his book "Development as Freedom" introduced dynamics into the capabilities approach. Using insights from the work of Sen (1999), Pugno (2017) develops a theoretical framework on endogenizing capability dynamics. However, Pugno (2017) deals with dynamics theoretically and does not derive policy implications in terms of freedom, functioning, and conversion efficiency. The lack of empirical work on this topic is largely due to the unavailability of panel data as mostly data is available at a point of time at the household and individual level. To solve this problem, we develop a methodology based on bootstrapping to study dynamics using the data available only at a point in time. Generally, theoretical modeling does not have an empirical input. However, bootstrapping can be used to understand the distributional properties of regression estimates. Hitherto, theoretical modeling focuses only on modeling the relationship between variables and ignores any information contained in the relationship between coefficients. However, our approach, based on bootstrapping, allows us to study and model the relationship between coefficients and helps us to derive policy implications in terms of impacts of change in a capability dimension on partial effects.

The specific objectives of the study are:

- to quantify Sen's functioning, freedom, and conversion efficiency for the overall functioning of "being achieved"
- to explore the dynamics of capability dimensions in various policy scenarios using district-level data for Pakistan

The rest of the paper is organized as: section 2 describes the concepts used in Sen's capabilities approach, section 3 explains indicators and data, section 4 explains the methodology, section 5 presents results and their implications and the last section 6 concludes the paper with policy implications.

[1] When first Human Development Report (1990) was published.

[2] See, for example, Robeyns (2005, 2011) for the theoretical survey and philosophical discussion on the capabilities approach.

2. SEN's CAPABILITIES APPROACH: BASIC CONCEPTS

Functioning, conversion efficiency, and freedom are key concepts of Sen's capabilities approach. Functioning is the sum of the "beings and doings" of a person. A person can be in either state of being or in a state of doing. The state of beings includes being-healthy, being-educated, being-sheltered, being-nourished, being-happy, etc. On the other hand, doings include traveling, studying, voting in an election, caring for a child, donating money to charity, taking part in the debate, and so on. It can be stated that functioning is the achievement achieved by a person. The state of being can be called a "stock", whereas the state of doing can be considered as a "flow". For example, the flow of exercise (the doing of exercise) adds to the stock of health (being-healthy). Similarly, reading adds to being-literate. However, this distinction between stock and flow may not be too simple in practice. Functioning either results from the choice of or constraint on a person. The functions that result from the choice of a person, are called "refined functioning" while the functions that arise due to the constraint are simply called "functioning".

Freedom represents the range of choices and degree of autonomy available to a person.[3] It has both instrumental and intrinsic value. Evaluation based on freedom provides an encompassing measure of wellbeing. Sen (1990) discusses freedom as a focal personal feature for ethical judgment on the lives of persons and compares it to primary goods and liberties (Rawls), rights (Nozick), resources (Dworkin), among others. Sen (1990) distinguishes between *means* and what people can obtain from these *means* and argues:

> *"Since the conversion of these primary goods and resources into freedom to select a particular life and to achieve may vary from person to person, equality in holdings of primary goods or resources can go hand in hand with serious inequalities in actual freedoms enjoyed by different persons". (p.115)*

In the capabilities approach, the notion of individual freedom has an opportunity aspect as well as the process aspect. The opportunity aspect is the advantage available to a person relative to others (Sen, 1985a) and his/her ability to achieve what he/she values irrespective of the process through which that achievement comes about. On the other hand, the process aspect is concerned with the process of choice itself (Sen, 2009). Opportunity aspects and process aspects are called by Sen "Capability" and "Agency" respectively. To achieve a functioning, it is the responsibility of a society to provide freedom as mentioned by Sen (1992):

> *"In dealing with responsible adults, it is more appropriate to see the claims of individuals on the society (or the demand of equity or justice) in terms of freedom to achieve rather than actual achievements. If the social arrangements are such that a responsible adult is given no less freedom (in terms of set comparisons) than others, it is possible to argue that no unjust inequality may be involved". (p.148)*

However, it does not mean that individuals do not have a responsibility to change their status for a better life. According to Sen (1999):

> *"The people have to be seen, in this perspective, as being actively involved – given the opportunity – in shaping their own destiny, and not just as passive recipients of the fruits of cunning development programs". (p. 53)*

The possession of commodities does not correctly represent the opportunity-freedom as Sen (2002) argues:

[3] Here we mean positive freedom. Sen (1987b), among others provides detail discussion on positive and negative freedom.

> *"[…] opportunity-freedom cannot be sensibly judged merely in terms of possession of commodities but must take note of the opportunity of doing things and achieving results one has reason to value". (p.519)*

Capability is a freedom-oriented concept as explained by Qizilbash (2011),

> *"[…] term "capability" refers to a range of lives from which a person can choose one and that if one has to list things which make a life good these are best understood as (valuable) functioning. The capability approach – as I understand it – sees wellbeing in terms of an evaluation of functioning – and the quality of life is seen in terms of the freedom to choose between lives". (p. 27)*

Due to difficulty in the measurement of freedom, most of the empirical studies focused on measuring "functioning" and left "process freedoms" in operationalizing the capabilities approach. Further, they have focused more on individual dimensions, in particular functioning or freedom, of capabilities and use objective indicators to quantify capabilities.[4] A 12-questions General Health Questionnaire (GHQ), which contained information related to the freedom aspect of "being achieved", is used by the German Socio-Economic Panel Survey (GSOEP) and British Household Panel Survey (BHPS).[5]

Conversion efficiency can be defined as the ability of a person to convert his/her resources into functioning given his/her freedom. It is influenced by individual/personal, social, and environmental conversion factors (Kuklys, 2005; Robeyns, 2005). Robeyns (2011) illustrates these conversion factors with the help of an example as:

> *"How much [conversion efficiency] a bicycle [a resource] contributes to a person's mobility [a functioning] depends on that person's physical condition (a personal conversion factor), the social mores including whether women are socially allowed to ride a bicycle (a social conversion factor), and the availability of decent roads or bike paths (an environmental conversion factor)". (p. 6)*

3. DATA AND INDICATORS

We utilize data from the Pakistan Socio-Economic Survey (PSES-2002) in our empirical analysis. It is the first survey which contains information on all aspect of capabilities. Therefore, to the best of our knowledge, the current study is the first to analyze all dimensions of capabilities. Due to the reasons discussed below in section 4, we focus on the capabilities of a single functioning, "being achieved". We measure capabilities in the dimensions of (1) functioning, (2) freedom, and (3) conversion efficiency based on subjective indicators given in the questionnaire about mental wellbeing in PSES.[6] These indicators are (1) a sense of achievement which measures functioning, (2) a sense of freedom to achieve measuring freedom, and (3) a sense of ability to achieve which measures conversion efficiency.

Along with twelve questions about mental wellbeing given in British Household Panel Survey, PSES adds nine more questions that are important for measuring achievement (functioning), freedom to achieve, and ability to achieve (conversion efficiency). Questions of the BHPS help to measure the sense of freedom only, while the additional nine questions in the PSES help to measure achievement and the ability to achieve, which are important dimensions of capabilities ignored by other surveys. We quantify all three

[4] Except for few such as Anand *et al*. (2011).
[5] To measure the freedom aspect of capabilities, Anand *et al*. (2011) developed their own survey instrument.
[6] According to Kuklys (2005) "There is no requirement that indicators have to be objective when evaluating welfare according to the capabilities approach." (p. 34)

dimensions of capabilities using different questions given in PSES. Questions posed under each indicator adequately serve the purpose of "being achieved in a generalized sense as discussed in the following subsections.

3.1 Sense of Freedom to Achieve (R)

It comprises three senses of freedom namely freedom of action, freedom of decision making, and freedom of problem-solving. These senses are approximately defined by the questions[7] (1) Have you recently felt that you are playing a useful part in things? (2) Have you recently felt capable of making decisions about things? (3) Have you been able to face your problems? given in the PSES survey.[8]

Up to what extent people can engage in useful activities they value is captured through the sense of freedom to act and participate. The question about playing a useful part in things shows one's freedom to do useful activities that matter to one's interests like seeking goals, performing religious duties, or fulfilling social responsibilities. The question about the capability of making decisions reflects the degree of freedom of an individual in decision making. Question regarding freedom is important due to many reasons. First, it is important in the process of a democratic election. An election process can be shown transparent amidst imposed implicit decisions on most voters by, for example, feudal lords, particularly in rural areas. Although it affects their sense of freedom in decision making, yet it is not reflected in any objective criterion. Second, freedom in decision-making also has a concern with the issues related to gender and ethnicity. Females are not encouraged or even allowed to make decisions about their careers in some societies which adversely affects the "freedom to achieve" of women. Similarly, in some regions, minority ethnic groups do not have the freedom to proceed in their preferred careers. On the other hand, a minority elite class is given favor in some systems. This affects the sense of freedom in the non-elite (the majority) class. As written documents and laws do not discriminate between the elite and the non-elite classes, therefore, this fact cannot be captured by an objective criterion. This biasedness cannot be overcome by providing equal freedom to all due to the presence of unequal and unjust initial endowment as mentioned by Burchardt (2009):

> *"But here the choice is not independent of previous conditions of inequality. Identical capability sets do not afford the same real chance, in practice, of achieving valuable functionings, and the reason for this difference is aspirations formed in previous unequal and unjust conditions". (p. 9)*

Finally, the third question reflects the ability of decision-making by an individual in an adverse situation.

3.2 Sense of Ability to Achieve (E)

"Sense of ability to achieve" is a proxy used for the physical and psychological ability of an individual to convert his/her material and non-material resources into achievement. Accomplishment is one of the five components[9] in the field of positive psychology (Seligman, 2011). "Sense of ability to achieve" is captured by the questions[10] (1) Do you normally accomplish what you want to? (2) Do you feel you can manage situations even when they do not turn out as expected? (3) Do you feel confident that in case of a crisis you will be able to cope with it? given in PSES. These questions address the sense of ability at three levels of difficulty – from a normal situation to a situation of crisis.

3.3 Sense of Achievement (F)

[7] Answers to these questions are ranging from "More so than usual" to "Much less usual" with four options.
[8] "The process aspect, being concerned with the freedom of the person's decisions, must take note of both (a) the scope for autonomy in individual choices, and (b) immunity from interference by others" (Sen, 2002).
[9] The other four are: positive emotion, engagement, relationships, and meaning and purpose.
[10] Answers to these questions are in Likert scale with four options ranging from "Most of the time" to "Hardly ever"

For quantification of "sense of achievement" questions[11] (1) Do you think you have achieved the standard of living and the social status that you had expected?[12] (2) How do you feel about the extent to which you have achieved success and are getting ahead?[13] (3) Do you feel life is interesting? are utilized from the PSES survey. The first question covers access to a decent standard of living - one of the dimensions (in a subjective way) of the Human Development Index (HDI). However, information regarding the level of satisfaction with the standard of living is also added to HDI. This level of satisfaction considers aspirations and feelings about the relative standard of living. The second and third questions support these feelings.

4. METHODOLOGY

Like most developing countries, we do not have a long panel of household or individual-level data to study dynamics. The data is available at a point in time only. To solve this problem, we have developed a methodology to study dynamics using the data available only at a point in time. The proposed methodology has three steps: bootstrapping of selected/supposed econometric model, theoretical modeling of relationships between estimated coefficients, and drawing policy emphasis regions under various scenarios.

4.1 Bootstrapping

This section builds up an econometric model to understand the interaction between different dimensions of capabilities. It assumes functioning as a function of freedom and conversion efficiency as

$$F=f(R, E)$$

Since the variables F, R, and E are ordinal with four categories, therefore OLS is not applicable. However, we convert the ordinal data into continuous using the methodology suggested in Hasan *et al*. (2016). In the first step of this method, we convert our discrete variables (F, R, and E) into continuous random variables by a method of simulation. In the second step, random numbers are generated from continuous probability distribution within the setting of a discrete probability distribution[14]. We then estimate the above relationship by the OLS method.[15] One thousand random samples are drawn with replacement from the data and obtain bootstrap estimates of α and β from the following equation.

$$F = a R + b E + \varepsilon \qquad \varepsilon \sim N(0, \sigma^2) \qquad (1)$$

Where ε is a random error term which is assumed to be normally distributed with zero mean and variance σ^2. The bootstrap estimates show a negative relationship between the coefficients (partial effects) of freedom (a) and efficiency (b):[16]

$$a = \alpha - \beta b \quad (\alpha > 0, \beta > 0) \qquad (2)$$

[11] Answers to these questions, with four options, ranging from "Very much" to "Not so much"

[12] Since Achievements (Functioning) are different aspects of living conditions, they are, in a sense, more directly related to living conditions (Sen, 1987a)

[13] "[…] opportunity-freedom cannot be sensibly judged merely in terms of possession of commodities but must take note of the opportunity of doing things and achieving results one has reason to value" (Sen, 2002).

[14] For more detail see Hasan *et al*. (2016).

[15] Though we can use ordered logit or Probit models in this situation, but we prefer to use the OLS method because of the restrictive assumptions of ordered choice models as discussed in Hasan *et al*. (2016).

[16] This relationship between partial effects also holds in case of all districts as shown by the bootstrapping results for each district (see Appendix).

This relationship is used to understand the theoretical dynamics of the model to derive some policy lessons. It identifies different policy regions (E, R, RE, and ER)[17] under alternative scenarios and applies it to the data. The study finds that most of the districts fit the low-freedom- opposed to low efficiency- scenario and most of them are located in the RE policy region.

4.2 Theoretical Modelling

Substituting equation (2) in the deterministic form of equation (1) gives the following general expressions for a and b in terms of the ratio of capability dimensions:

$$a = \frac{\alpha(E/R)-\beta(F/R)}{(E/R)-\beta} \tag{3}$$

$$b = \frac{(F/R)-\alpha}{(E/R)-\beta} \tag{4}$$

Dividing equation (3) by (4) gives the ratio of partial effects of R and E.

$$\frac{a}{b} = \frac{\alpha(E/R)-\beta(F/R)}{(F/R)-\alpha} \tag{5}$$

Change in the ratio of partial effects due to change in E, R and F are given below in equations 6, 7, and 8 respectively.

$$\frac{\partial(a/b)}{\partial E} = \psi_1 = \frac{(\alpha/R)}{(F/R)-\alpha} = \frac{\alpha}{F-\alpha R} \tag{6}$$

$$\frac{\partial(a/b)}{\partial R} = \psi_2 = \frac{\alpha(\beta F-\alpha E)}{(F-\alpha R)^2} \tag{7}$$

$$\frac{\partial(a/b)}{\partial F} = \psi_3 = \frac{(F-\alpha R)(-\beta)-(\alpha E-\beta F)}{(F-\alpha R)^2} = \frac{\alpha(\beta R-E)}{(F-\alpha R)^2} \tag{8}$$

Assuming both α and β to be positive and $\left((F/R)-\alpha\right)$ non-zero then ψ_1 could be positive when $(F/R) > \alpha$ and $(F/R) < \alpha$. ψ_2 could be positive when $(F/E) > (\alpha/\beta)$, $\psi_2 = 0$ when $(F/E) = (\alpha/\beta)$ and $\psi_2 < 0$ when$(F/E) < (\alpha/\beta)$. ψ_3 could be > 0 when $(E/R) < \beta$ and $\psi_3 = 0$ when $(E/R) = \beta$ and $\psi_3 < 0$ when $(E/R) > \beta$.

4.3 Policy regions

Policy emphasis depends on a district level of efficiency relative to freedom (E/R) and the level of achieved functioning (F).

i) A district with relatively lower achieved functioning (F) having a lower (larger) ratio of efficiency to freedom (E/R) then a threshold should target (ER) policy focus primarily on efficiency (E) with the increasing emphasis on freedom (R) as functioning (F) increases because targeting RE would further decrease F.

ii) A district with relatively better-achieved functioning (F), in region ER (RE), having a ratio of efficiency to freedom (E/R) less (more) than the minimum threshold should target both policy focus on efficiency (E) and policy focus on freedom (R) with the increasing emphasis on freedom (efficiency). This is because the effectiveness of targeting efficiency (freedom) declines as

[17] E, R, RE and ER representing policy focus on E, policy focus on R, policy focus primarily on R with increasing emphasis on E as F increases, and policy focus primarily on E with increasing emphasis on R as F increases, respectively.

functioning increases and that of freedom (efficiency) increases. This is like having decreasing returns to policy. As functioning improves and crosses to region III (see Figure 1), the policy emphasis should be completely shifted to R(E) as the diminishing returns to targeting E(R) lead to a negative effect on F.

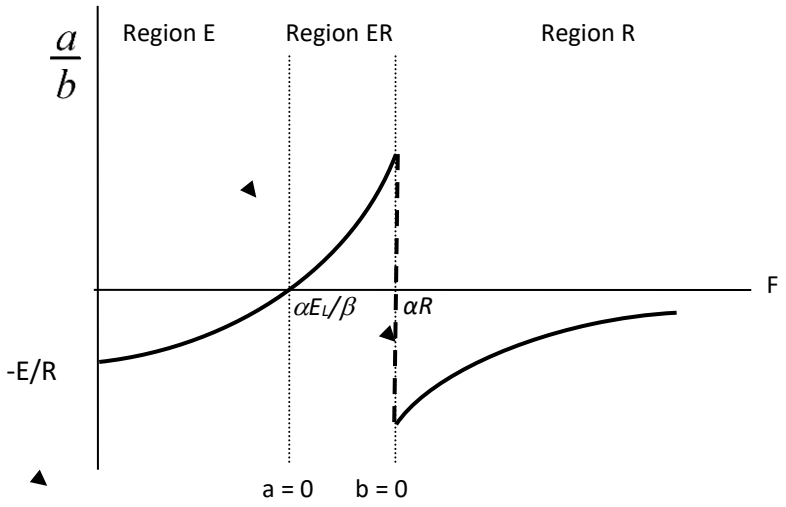

Figure 1: Policy emphasis regions for the low-efficiency scenario ($E/R < \beta$ which implies $\partial(a/b)/\partial F>0$)

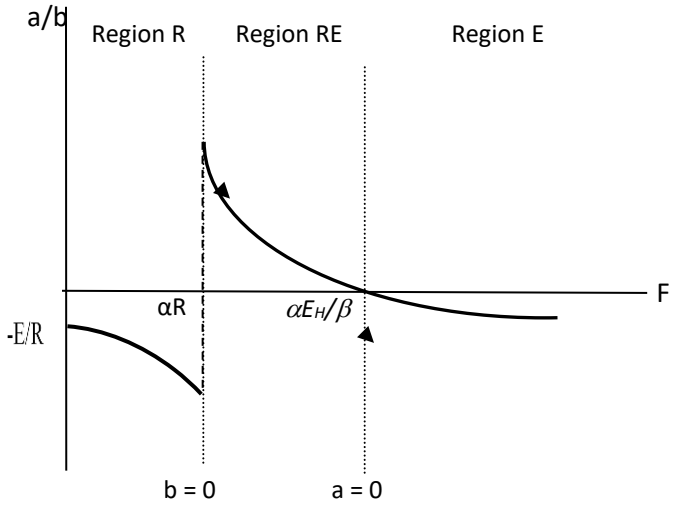

Figure 2: Policy emphasis regions for the low-freedom scenario ($E/R>\beta$ which implies $\partial(a/b)/\partial F<0$)

Appropriately targeted policies in different scenarios are summarized below in Table 1a and Table 1b.

Table 1a: Scenario 1: If we target E (when $E/R<\beta$ and R is fixed) $F=\alpha E/\beta$ would increase at a slower rate than E. As a result

	$E/R<\beta$		
	F	Sign of a and b	Appropriate Policy Target
Region E (Low *F*)	$F<\alpha E/\beta$	a < 0 b > 0	E
Region ER (middle *F*)	$\alpha R>F>\alpha E/\beta$	a > 0 b > 0	E and R with the increasing emphasis on R as *F* increases
Region R (High *F*)	$F>\alpha R$	a > 0 b < 0	R

Table 1b: Scenario 2: If you target R (when $E/R>\beta$ and E is fixed) $F=\alpha E/\beta$ would increase at a faster rate than E. As a result

	$E/R>\beta$		
	F	Sign of a and b	Appropriate Policy Target
Region R (Low *F*)	$F<\alpha R$	a > 0 b < 0	R
Region RE (Middle *F*)	$\alpha R<F<\alpha E/\beta$	a > 0 b > 0	R and E with the increasing emphasis on E as *F* increases
Region E (High *F*)	$F>\alpha E/\beta$	a < 0 b > 0	E

The above analysis is applied to all the districts and policy emphasis region is identified for each district.

5. RESULTS AND DISCUSSION

From the above analysis and discussions, it is concluded that there are four policy target regions, (1) policy focus on efficiency (E), (2) policy focus on freedom (R), (3) policy focus primarily on freedom with the increasing emphasis on efficiency as functioning increases (RE) and (4) policy focus primarily on efficiency with the increasing emphasis on freedom as functioning increases (ER). We repeat the bootstrapping exercise at district level data and compute α and β for each district. Based on the values of α and β together with levels of efficiency (E) and freedom (R), we sort 57 districts into different policy regions as shown in Table-A1of Appendix. Results show that thirty-five (61.4%) districts fall in policy region RE that is policy focus primarily on freedom with the increasing emphasis on efficiency as functioning increases. It means that freedom is a precondition for efficiency and functioning in these districts. Sixteen (28%) districts are found to fall in policy region E that is policy focus on efficiency and six (10.5%) districts in policy region R, the policy focus on freedom. There is no (0%) district in the region ER that is policy focus primarily on efficiency with the increasing emphasis on freedom as functioning increases.

Our results show that majority of the districts have low freedom. This could be due to pressure groups in the democratic election process in these districts because of the presence of feudal landlords and politically influential personalities. These pressure groups not only affect the right of voting of the common people according to their free will but also influence the capability to make decisions in various situations. As Mahbub-ul-Haq also showed dissatisfaction with the situation and said: “In blunt terms, Pakistan’s capitalistic system is still one of the most primitive in the world. It is a system in which economic feudalism prevails.”

Finally, we compare the HDI18 ranking of a district with its "policy region" to check whether the "policy region" depends on the level of HDI or not. Results are given in Table- A1 of the Appendix shows that whether a district has a high or low rank in HDI, the policy conclusions will remain the same. This implies that human development does not matter in qualitative capability dimensions of life. This is understandable since capability dimensions are more concerned with the power and cultural structure of society. Since most of these districts are predominately rural areas, feudal lords have complete authority and autonomy over their people which have a large impact on the capabilities of these people.

6. CONCLUSION

There is hardly any research work to study the dynamics of the capability approach, introduced by Sen (1999), due to the unavailability of suitable data. We have developed a methodology based on bootstrapping in this paper and were able to study dynamics using data available at a point of time only. Using district-level data from Pakistan Socio-Economic Survey (PSES), our results revealed that most districts were in the policy region where the focus on freedom with the increasing emphasis on efficiency was required with the increase in functioning. We also found that human development has no correspondence with capability dimensions.

Our results show that majority of the districts are classified as low freedom. So, improving the freedom of these people would mean giving them the rights they deserve. Due to the presence of pressure groups, peoples are not free to make decisions in different situations. These people need freedom from servitude as mentioned by Danis Goulet in three core values of development.

Low freedom may also be due to a low level of education and illiteracy. Improving education levels and literacy may improve the overall freedom of these districts. The low level of education can also be linked to the system of landlords which does not encourage better and higher levels of education in fear of opposition to the status quo. To improve the capabilities dimension with a special focus on increasing freedom of the peoples, land reforms should be implemented and reduce the concentration of wealth and power in few hands in the country. As we also found that human development does not matter in qualitative capability dimensions of life, therefore, a separate focus is required to enhance capability dimensions.

Acknowledgment
We are thankful to anonymous reviewers of the paper for the valuable comments which helped us to improve its quality.

Funding Source:
The author(s) received no specific funding for this work.

Conflict of Interests:
The authors have declared that no competing interests exist.

REFERENCES

Anand, P. (2011). Reviews. Capabilities and Happiness, edited by Luigino Bruni, Flavio Comim and Maurizio Pugno. Oxford University Press, (2008). *Economics and Philosophy*, 27: 175-215.

Burchardt, T. (2009). Agency goals, adaptation and capability sets. *Journal of Human Development and Capabilities*, 10(1), 3-19.

[18] Data on HDI at district level is taken from "National Human Development Report 2003, UNDP Pakistan"

Hasan, H., & Khan, H. (2015). Do Sen's capabilities determine happiness? Evidence from a unique survey. *International Journal of Happiness and Development*, 2(2), 160.

Hasan, H., Rehman, A., & Bhatti, I. (2016). A new approach to address issues related ordered choice endogenous models. *Quality and Quantity -International Journal of Methodology*, 50(5), 2175-2184.

Human Development Report (HDR) (1990). United Nations Development Programme (UNDP)

Kuklys, W. (2005). Amartya Sen's Capability Approach – Theoretical Insights and Empirical Applications. Berlin: Springer Verlag.

Nussbaum, M., (2000). *Women and Human Development: The Capabilities Approach*. Cambridge University Press.

Nussbaum, M. (2005). Well-Being, Contracts and Capabilities. *Rethinking Well-Being*, 27.

Pakistan National Human Development Report (2003) United Nations Development Programme, Pakistan.

Pakistan Socio-Economic Survey (PSES) round-II (2002) Pakistan Institute of Development Economics (PIDE), Islamabad, Pakistan.

Pugno, M, (2017). Scitovsky meets Sen: endogenising the dynamics of capability. *Cambridge Journal of Economics*, 41(1), 1177-1196.

Qizilbash, M. (2011). Sugden's Critique of the Capability Approach. *Utilitas*, 23(1), 25-51.

Robeyns, I. (2005). The capability approach: A theoretical survey. *Journal of Human Development*, 6(1), 93-117.

Robeyns, I. (2011). The capability approach. In the Stanford Encyclopaedia of Philosophy (Summer Edition), Edward N. Zalta (ed). (Available at URL: http://plato.stanford.edu/archives/sum2011/entries/capability-approach)

Seligman, M.E.P. (2011). *Flourish: A Visionary New Understanding of Happiness and Wellbeing*. New York: Free Press.

Sen, A.K. (1984). *Resources, Values and Development*. Oxford: Basil Blackwell.

Sen, A.K. (1985a). Wellbeing, Agency and Freedom: The Dewey Lectures 1984. *Journal of Philosophy*, 82(4), 169-221.

Sen, A.K. (1985b). *Commodities and Capabilities*. North-Holland.

Sen, A.K. (1987a). *Standard of Living*. Cambridge University Press.

Sen, A.K. (1987b). *Freedom of Choice: Concept and Content*. World Institute for Development Economics Research of the United Nations University, WP 25.

Sen, A.K. (1990). Justice: Means versus freedoms. *Philosophy and Public Affairs*, 19(2), 111-121.

Sen, A.K. (1991). Welfare, preference and freedom. *Journal of Econometrics*, 50, 15-29.

Sen, A.K. (1992). *Inequality Reexamined*. Oxford: Oxford University Press.

Sen, A.K. (1993). Positional objectivity. *Philosophy and Public Affairs*, 22(2), 126-145.

Sen, A.K. (1999). *Development as Freedom*. Oxford University Press.

Sen, A.K. (2002). *Rationality and Freedom*. Massachusetts: Belknap Press.

Sen, A.K. (2009). *The Idea of Justice*. ALLAN LANE, Penguin Group.

Stiglitz, J.E., Sen, A., & Fitoussi, J.P. (2009). *Report by the Commission on the Measurement of Economic Performance and Social Progress*, Paris [online] http://www.stiglitzsen-fitoussi.fr/en/index.htm.

Appendix A: Policy targets at the district level (The Appendix reports the values for F, E, R, α, and β, and their ratios, and identify the policy region a district falls in. E, R, RE, and ER)

Low-Efficiency districts	**E/R < β Policy**								
District (HDI/Rank)	**F**	**E**	**R**	**α**	**β**	**E/R**	**αE/β**	**αR**	**Region**
MARDAN (0.519/32)	0.82	0.67	1.13	0.81	0.91	0.60	0.60	0.92	E
PESHAWAR (0.531/24)	0.81	0.64	1.09	0.82	0.84	0.59	0.63	0.89	E
DADU (0.535/21)	0.95	0.73	0.96	0.80	0.86	0.76	0.67	0.77	R
KOHAT (0.537/19)	0.89	0.81	1.18	0.65	0.73	0.69	0.72	0.76	R
BANNU (0.465/55)	0.76	0.48	0.93	0.58	0.65	0.51	0.42	0.54	R
KALAT (0.412/74)	1.17	0.98	1.18	0.88	0.99	0.83	0.87	1.03	R
Low Freedom districts	**E/R>β Policy**								
District (HDI/Rank)	**F**	**E**	**R**	**α**	**β**	**E/R**	**αE/β**	**αR**	**Region**
OKARA (0.528/29)	0.68	0.68	0.78	0.73	0.77	0.87	0.64	0.57	E
GUJRAT (0.543/16)	1.08	1.07	0.97	0.76	0.90	1.10	0.91	0.74	E
SIALKOT (0.555/14)	1.15	0.96	0.91	0.77	0.82	1.05	0.90	0.70	E
BAHAWALPUR (0.501/40)	1.33	1.15	1.13	0.58	0.54	1.02	1.23	0.65	E
BAHAWALNAGAR (N/A)	1.45	1.11	0.83	0.38	0.37	1.34	1.12	0.31	E
JACOBABAD (0.393/77)	0.55	0.45	0.79	0.57	0.48	0.57	0.54	0.45	E
SHIKARPUR (0.417/72)	0.98	0.65	0.82	0.66	0.58	0.79	0.73	0.54	E
SUKKUR (0.486/47)	0.89	0.76	0.87	0.68	0.65	0.88	0.80	0.59	E
LARKANA (0.435/67)	0.98	0.82	1.11	0.61	0.63	0.73	0.79	0.68	E
SANGHAR (0.461/56)	0.60	0.54	0.66	0.54	0.49	0.82	0.60	0.36	E
NAWAB SHAH (0.481/49)	0.85	0.69	0.59	0.60	0.53	1.17	0.78	0.36	E
D.I. KHAN (0.425/69)	1.17	0.96	1.08	0.21	0.37	0.89	0.53	0.22	E
QUETTA (N/A)	1.23	1.39	1.38	0.53	0.60	1.00	1.22	0.73	E
LORALAI (0.556/13)	1.32	1.57	1.60	0.52	0.72	0.98	1.14	0.83	E
RAWALPINDI (0.576/9)	1.18	1.33	1.31	0.94	1.00	1.01	1.26	1.24	R
KHAIR PUR (0.449/63)	0.90	0.73	1.21	0.76	0.39	0.60	1.42	0.92	R
ATTOCK (0.507/37)	1.08	1.34	1.05	0.71	0.54	1.28	1.77	0.74	RE
JHELUM (0.703/1)	1.21	1.25	1.25	0.70	0.69	1.00	1.27	0.87	RE
ISLAMABAD (0.612/6)	1.26	1.20	1.46	0.69	0.37	0.82	2.22	1.00	RE
SARGODHA (0.535/22)	0.96	0.98	1.03	0.65	0.47	0.95	1.35	0.67	RE
MIANWALI (0.537/20)	1.10	1.22	1.20	0.67	0.55	1.01	1.49	0.80	RE
KHUSHAB (N/A)	1.04	1.03	0.98	0.45	0.44	1.05	1.07	0.44	RE
BHAKKAR (0.581/7)	1.27	1.25	0.95	0.44	0.27	1.32	2.03	0.41	RE
LAHORE (0.558/12)	1.03	1.28	1.12	0.59	0.54	1.15	1.40	0.66	RE
KASUR (0.577/8)	0.88	0.94	1.04	0.54	0.50	0.90	1.00	0.56	RE
SHEIKHUPURA (0.621/4)	0.81	0.91	1.05	0.47	0.33	0.87	1.26	0.49	RE
GUJRANWALA (0.529/25)	1.04	0.99	0.87	0.55	0.44	1.14	1.23	0.48	RE
FAISAL ABAD (N/A)	0.80	0.95	0.90	0.62	0.59	1.06	0.99	0.56	RE
T.T. SINGH (N/A)	0.83	0.91	0.91	0.58	0.62	1.00	0.85	0.53	RE
JHANG (0.529/27)	0.74	0.90	0.61	0.63	0.48	1.48	1.19	0.38	RE
MULTAN (0.494/44)	0.95	1.18	0.99	0.52	0.51	1.19	1.20	0.52	RE
VEHARI (0.508/36)	1.13	0.95	0.74	0.54	0.41	1.28	1.24	0.40	RE
SAHIWAL (0.541/17)	0.89	1.00	0.88	0.68	0.73	1.13	0.93	0.60	RE
D.G. KHAN (0.471/53)	1.22	1.38	1.20	0.75	0.67	1.15	1.55	0.90	RE

Appendix A continued...

Low Freedom districts	**E/R>β Policy**								
District (HDI/Rank)	**F**	**E**	**R**	**α**	**β**	**E/R**	**αE/β**	**αR**	**Region**
LEIAH (N/A)	1.04	1.34	1.02	0.54	0.40	1.31	1.80	0.55	RE
MUZAFFARGARH (0.459/59)	0.95	1.04	1.04	0.54	0.50	1.00	1.11	0.56	RE
RAJANPUR (N/A)	1.06	1.16	0.87	0.70	0.67	1.33	1.22	0.61	RE
R.Y. KHAN (0.541/18)	1.15	1.14	0.77	0.48	0.44	1.47	1.25	0.37	RE
HYDERABAD (0.532/23)	0.57	0.67	0.76	0.48	0.53	0.88	0.61	0.37	RE
BADIN (0.459/60)	0.79	0.83	1.03	0.63	0.41	0.80	1.27	0.65	RE
THARPARKAR (0.343/88)	1.03	0.79	1.15	0.58	0.41	0.68	1.12	0.67	RE
THATTA (0.447/64)	0.80	0.80	1.00	0.36	0.31	0.80	0.96	0.37	RE
MIRPUR KHAS (0.522/31)	1.03	0.66	1.29	0.67	0.41	0.51	1.09	0.86	RE
KARACHI (0.618/5)	1.34	1.29	0.98	0.53	0.47	1.31	1.44	0.52	RE
DIR (0.413/73)	0.73	0.57	0.79	0.65	0.49	0.72	0.75	0.51	RE
SAWAT (0.442/66)	0.67	0.97	0.83	0.55	0.40	1.16	1.32	0.46	RE
MANSEHRA (0.459/58)	0.99	1.04	1.02	0.46	0.14	1.02	3.37	0.47	RE
ABBOTTABAD (0.598/6)	0.91	0.99	1.12	0.48	0.35	0.88	1.38	0.54	RE
KARAK (0.484/48)	0.80	0.66	0.97	0.25	0.16	0.69	1.04	0.24	RE
SIBI (0.411/75)	1.06	1.26	1.40	0.42	0.46	0.90	1.15	0.59	RE
MEKRAN (N/A)	1.02	0.90	0.97	0.66	0.35	0.92	1.72	0.65	RE

Kashmir Economic Review, Volume 29, Issue 2, December 2020

Kashmir Economic Review
ISSN(P): 1011-081X, ISSN(E): 2706-9516
http://www.ker.org.pk

A Time Series Analysis of Financial Sector Development of Pakistan

ABSTRACT

This article empirically investigates the contributing factors of Pakistan's financial sector by using time series data from 1973 to 2019. Several studies discuss the role of financial development in explaining economic activities, but the literature on the determinants of financial sector development is an infant in Pakistan. This study is an attempt in this way. Therefore, we allow structural breaks endogenously to avoid spurious relationships among the variables. Notably, we use unit root tests which allow multiple breaks. This test confirms that some of the data series have different levels of integration. We find that trade openness, capital account liberalization, investment, GDP per capita, and remittances are essential variables to make the financial sector a well-functioning system. Inflation, tight monetary policy, and public debt may hurt Pakistan's financial sector.

AUTHORS

Abdul Jalil*
Professor of Economics, Pakistan Institute of Development Economics, Islamabad, Pakistan
Author's Contributions: 1, 4, 5, 6
abduljalil@pide.org.pk
https://orcid.org/0000-0002-6791-5198

Nazia Bibi
Assistant Professor of Economics, Pakistan Institute of Development Economics, Islamabad, Pakistan
Author's Contributions: 2, 3, 6
nazia@pide.org.pk

Keywords
Financial Development; Structural Breaks, ARDL

JEL Classification
E44, E52, F6, G2, O16

Please cite this article as:
Jalil, A., & Bibi, N. (2020). A time series analysis of financial sector development of Pakistan, *Kashmir Economic Review*, 29(2), 14-30.

*** Correspondence author**

Author's contribution in the article: 1- Conceived and designed the analysis, 2- Reviewed and compiled the literature, 3- Collected the data, 4- Contributed data or analysis tools, 5- Performed the analysis, 6- Wrote the paper, 7- Financial support for the conduct of the study, 8-Other

1. INTRODUCTION

A country's economic growth is a delicate process that depends on the well-functioning financial sector and other factors like resource endowment, education attainment, the legal system, international trade, and religious diversity (Levine, 1997). However, empirical studies on the subject give unconvincing shreds of evidence in the context of the impact of financial development (Fufa & Kim, 2018; Batuo *et al*. 2018 Benczur *et al*. 2019). The controversy may be divided into four different lines of research. First, finance promotes economic activities (Bagehot, 1873; Schumpeter, 1911; Levine, 1997; Jalil *et al*., 2010), second finance hurts economic growth third finance follows economic growth (Robinson, 1952) and, fourth finance does not matter (Lucas, 1988). Notably, the discussion on financial sector development re-emerged in the recent great recession (Haiss *et al*., 2016; Loayza *et al*., 2017; Žukauskas & Hulsmann, 2019). It implies that the financial sector draws special attention and many economists attempt to explore its development determinants. They document that the essential determinants which may positively affect the financial sector are trade openness, capital account openness, remittances, institutional quality, legal tradition, initial endowment, education level, investment, inflation, fiscal policy, and monetary policy (Friedman,1968; Acemoglu *et al*., 2001; Huang, 2005; Chin & Ito, 2006; Huang, 2010).[1] On the other hand, inflation and public debt may hurt financial activities.

The empirical study of Huang (2005) postulates that the financial sector also depends on several economic and socio-economic factors. Notably, recent studies clearly show that the economies' financial sector is being developed by trade openness, inflation, remittance, and economic growth. Specifically, Huang (2005) points out that the differences in geographical conditions, cultural characteristics, institutional qualities, and many other macro-economic factors determine the countries' financial development.

It is also postulated in the literature that sometimes one factor can change the speed of financial sector development despite the similarities in other factors. For example, the legal traditions and practices matter a lot in England and France to determine financial activities. Similarly, Mexico and Canada, on the other hand, differ due to differences in their income level and geographical endowment. Whereas in Latin America, macroeconomic policies are responsible for differences in the financial markets. Voghouei *et al*. (2011) document that political institutions' role is vital in England and Mexico.

This backdrop motivates a researcher to investigate the determinants of a developing country's financial sector like Pakistan. Several developing countries, including Pakistan, launched financial reforms over the last 20 years. Indeed, developing countries' financial sector becomes healthy over the last fifteen years. For example, the banking sector's health measured by Non-Performing Loans (NPLs) is improved in developing countries. The stock markets become regularized, mutual funds and clearinghouses are established. Unfortunately, no scientific study was conducted on the determinant of any developing country's financial sector development.

Therefore, this study is an attempt to fill this research gap. Interestingly, Pakistan is an excellent candidate to investigate for several reasons. For example, many financial reforms were introduced in the early 1990s. Then the financial sector of Pakistan saw a road of success. Now, Pakistan's financial sector can absorb the severe financial crises like the financial crises of 1997 and financial crises of 2007-08. Therefore, Pakistan is a good case study for investigating the determinant of the financial sector for giving a roadmap to other developing countries in financial reforms.

This study explores the importance of the financial sector, the macroeconomic variables that promote the financial sector that is the banking sector in Pakistan over the period 1973-2019. We shall use Auto-

[1] Rajan and Zinglaies (2003) argue that even economic openness does not promote financial activities in the presence of strong incumbents.

Regressive Distributed Lag Models (ARDL). This estimator handles the time series issues more smartly than any other finding relationship in the time-series data. This approach's estimates are consistent even in the case of a small sample size.

Pakistani financial sector includes banking institutions, stock exchange markets, non-banking financial institutions (NBFIs), and insurance companies. Among all other financial institutions, the banking sector of Pakistan remains dominant. 88 % of the financial sector and the rest of the 12 percent consist of the whole non-banking financial system. Therefore, the present paper deliberately focuses on the system's banking part. The prominent literature measures the bank-based financial sector with liquid liabilities deposited in the banks, credit to the private sector, and commercial bank assets to central bank assets ratio.[2] Generally, there is good harmony among these indicators, and they move in the same ways. However, the case of Pakistan is different. The liquid liabilities are continuously moving up and, on the other hand, the credit to the private sector witnessed several ups and downs. Specifically, the liquid liabilities substantially increased, and the credit to the private sector witnessed a historic dip over the last 15 years (see Figure 1). Therefore, a single indicator will not reflect the exact picture of Pakistan's financial sector. Keeping this backdrop in view, we construct an index to measure financial sector development. This index covers both sides of the financial sector of Pakistan.

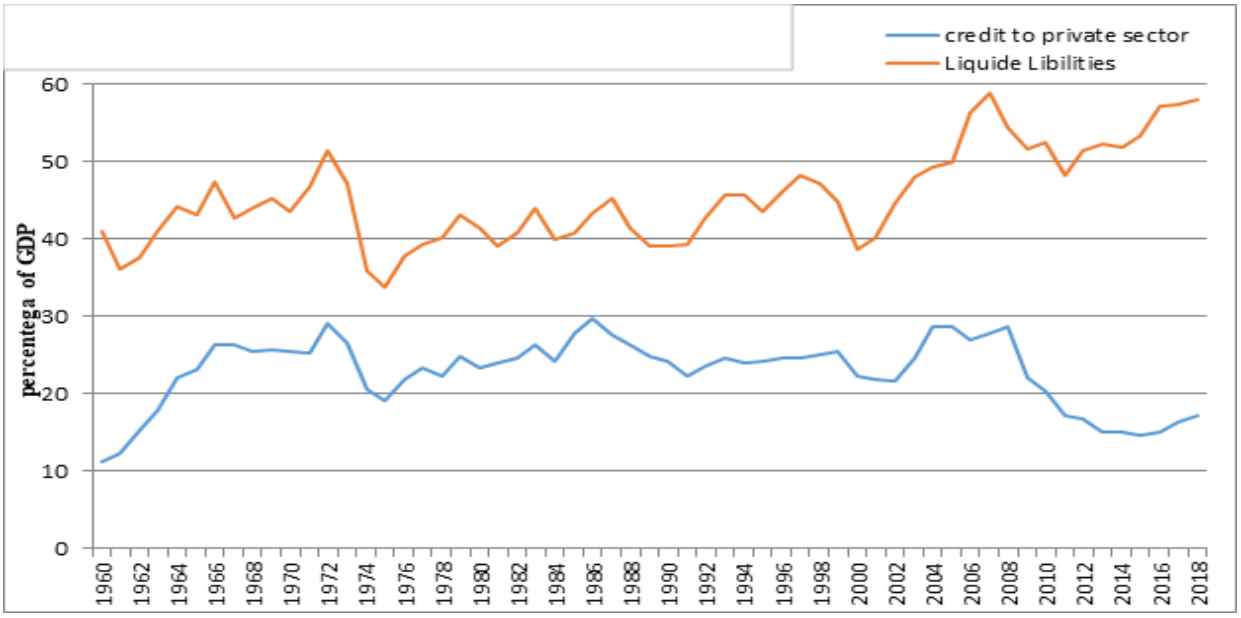

Figure 1: Credit to the private sector and liquid liabilities
Source: Author's calculation and Data is taken from World Development Indicators

The rest of the study is organized conventionally. The literature review is presented in Section II. Section III provides a brief overview of the financial sector of Pakistan. Section IV sets the analytical framework. The construction of variable and data sources is discussed in section V. Section VI and section VII discuss the empirical results and conclude the article.

2. LITERATURE REVIEW

As mentioned earlier, the recent surge of the papers in finance-growth nexus literature documents that the FD is an exogenous source of the economies' economic activities. On the other hand, some equally essential

[2] The detailed of these indicators will be discussed in detail in the later part of the paper.

studies clearly show that some essential macro-economic variables are developing the financial sector. Specifically, Huang (2005) points out that many economic and non-economic variables may affect the financial sector's development.

Therefore, the empirical literature on the FSD gets a significant turn and examines the FD determinants. In this regard, the steppingstone is liberalization, which can affect financial development through various channels. For example, Shaw (1973) highlights that financial liberalization can foster the financial sector and then economic activities by increasing its productivity. Fry (1995) argues that reserve and liquidity requirements are a tax on financial intermediation. This thinking leads to a decrease in the financial sector's size by increasing the loan interest rate and deposit rate gap.

Furthermore, the banking sector liberalization might decrease financial restriction and the capital premium's external cost, promoting financial development and investment. Stulz (1999) believed that capital liberalization allows foreign and domestic agents to invest in different portfolios. It will reduce the capital cost and increase the availability of funds that deepen the financial sector level. Financial liberalization is the lowering of credit control, interest rate deregulation, banking sector independence, banking sector privatization, and free entry in the financial markets. Trade openness and trade liberalization may be another pivotal determinant of financial sector development. Specifically, Svaleryd and Vlachos (2002) and Law and Habibullah (2009) document that trade openness may affect financial development.

The classic papers of Greenwood and Smith (1997) among others find that financial activities have some vital role in channelizing the investment to its maximum use.[3] More vocally, Levine and Renelt (1992) document that the increased and channelized investment spurs the economic activities, promoting financial development. More recently, Huang (2010) finds that external finance demand increases due to increased private investment. This channel affects financial intermediation by encouraging savers to deposits in banks and productive business instead of unproductive assets. Huang (2010) argues that financial intermediaries favoring productive investment induce portfolio allocation and investments. It offers easing liquidity risk, liquidity to savers, reducing transaction cost, and exerting corporate control.

Boyd *et al*. (2001) note that the country's inflation may also play a role in determining financial activities. However, this line of research's empirical literature is not clear about the link between financial activities and inflation. The literature finds both linear and non-linear relationships between inflation and finance. For example, Boyd *et al*. (2001) note that price stability has a strong and positive effect on financial activities. Similarly, Aggarwal *et al*. (2011) and Bittencourt (2011) document that the rise in inflation may depress financial intermediaries' activities and promote channelizing the saving in real assets.

Furthermore, the recent financial crises of 2007 and the current debt crises in the Eurozone have turned policymakers' attention towards fiscal policy's role in financial activities. Caballero and Krishnamurthy (2001) conclude that expansion of fiscal policy reduces the country's assets' liquidity valuation because a rise in government expenditures crowds out private investment. Keeping this in view, Hauner (2009) examines the relationship of public debt with financial development and concludes that the concept of lazy banks besides the safe banks' view explains the positive role of public debt to financial debt. Furthermore, Ismihan and Ozkan (2012) provide the theoretical framework on public debt's role in financial development and concludes that public debt negatively affects financial development.

Not even fiscal policy but monetary policy also has crucial implications for the financial markets, leading to economic growth (Patrick, 1966). Patrick (1966) believes that the monetary and financial authorities should focus on the policies that may attract the savers to invest in the financial instruments. However,

[3] Some important theoretical papers of Beneivenga *et al*. (1999), Greenwood and Jovanovic (1990), Diamond and Dybvig (1983) may be referred in this context.

Carranza *et al*. (2006) point out that the monetary policy can set only the short-term interest rates to affect inflation and economic growth. Therefore, from the point of view of Carranza *et al*. (2006), we can extract that monetary policy may effectively explain the variations in financial development through interest rate channels and credit channels.

Remittances are funds expected from migrants working abroad and, interestingly, are proved to be less volatile than official aid and foreign direct investment. Besides this, the remittances are also crucial for FD due to its stable financing nature. Saca and Caceres (2006) find that remittances can cause economic activity contraction due to decreased saving. Azam and Guberi (2006) and Chami *et al*. (2003) find the ambiguous effect of remittances on economic growth, that is, it hurts growth if the studies focus on labour supply in response to remittances. On the other hand, the effect is positive in finance and remittances nexus (Giuliano & Ruiz-Arranz, 2009; Toxopeus & Lensink, 2006; Aggarwal *et al*., 2011).

Similarly, Gupta *et al*. (2007) find that remittances positively affect FD. The money transfers for migrants facilitate the smoothening of budget constraints households. Furthermore, it provides an opportunity for the household to be a part of the formal financial sector through their small savings, and thus the improvement in the financial sector can be gained. The same is right in the case of Bangladesh (Chaudhury 2015). Therefore, remittances can be considered a stable source of financial sector development.

Several necessary studies consider institutions' role as an essential determinant of financial activities. Specifically, the legal environment has been identified as essential for financial markets' essential functions. More clearly, the theory of legal region in the context of financial sector development is designed by La Porta *et al*. (1998) and is applied by Beck *et al*. (2000). They explain the property rights and working of the financial sector in the backdrop of the colonization process. La Porta *et al*. (1998) explain that it is the legal and regulatory environment in financial transactions responsible for FD differences. Mayer and Sussman (2001) also find that prudential regulations and practices like accounting standards, insurance, and regulation concerning information disclosure play a key role in developing financial markets.

Huang (2005) and Arif. and Rawat (2019), finds that political liberalization promotes financial development by limiting the leading group's effect over the policymakers. It helps in promoting political rights and civil liberties. Chin and Ito (2006) conclude that the development of the general legal system endorsed FD through financial liberalization. However, Modigliani and Perotti (2000) and Rajan and Zingales (2003) document that banking finance is used in countries where contract enforcement is weak, collateral is emphasized more. Yang (2011), among others like, Selçuk (2019) and Khan *et al*. (2020) note that democracy props up the financial market because of its institutional features such as checks and balances and political competition.

3. A QUICK REVIEW OF FINANCIAL SECTOR OF PAKISTAN

According to the adaptions policies, Pakistan's banking sector developments are divided into three main eras. These are, first from 1947 to 1973, second from 1973 to 1990 and third from 1991 to today. Pakistan's financial sector started its journey with only 195 branches of few banks without any central bank in 1947.[4] The government's first step to regulate the existing banking system and get its assets from the Reserve Bank of India (RBI). The next was establishing a central bank, and it was established on July 1, 1948, named as state bank of Pakistan (SBP).[5] By the end of 1973, with the help of dynamic policies of SBP, the banking

[4] At that time current Bangladesh was also the part of Pakistan and known as East Pakistan. Therefore, we may easily guess that how the financial sector was developed in in early 1950s.

[5] Pakistan came into being as of result of partition of Indian sub-continent, which was a colony of British Empire till 13th August 1947.

sector expanded from 195 branches to 3233 domestic branches (of 14 banks) and 74 branches of foreign banks.

In 1974, the nationalization policy was adopted to efficiently regulate the banking sector for more efficient financial capital utilization. Under this nationalization policy, 14 private commercial banks were merged into five nationalized commercial banks (NCBs). These NCBs expanded their branches to remote areas of the country for providing nationwide financial services to underdeveloped areas for their development. Pakistan banking council (PBC) was also established under the nationalization act of 1974 to regulate the affairs of NCBs. The objectives of attaining commercial banks' efficiency and growth and accelerating the competition to develop a more diversified banking system by nationalizing commercial banks could not be met. It was witnessed that the financial sector served mostly corporate business, incumbents, and politicians by the end of the 1980s. The board of directors and chief executive officers of the banks were not independently appointed on a merit basis.

Consequently, banking activities were not always commercially motivated. Therefore, a considerable amount was a flight out of the financial system. This was termed as bad loans and NPL. It was safely claimed that the big banks were not in control of their purposes during the late 1970s and 1980s.

This paved the way for financial sector reforms of the 1990s in Pakistan. These reforms covered seven important financial liberalization areas: financial institutions, domestic debt management, monetary sector management, banking law & regulations, foreign exchange & liabilities, and developments of the capital market.

The initial step of the financial reforms involved privatizing nationalized commercial banks. Under these reforms, PBC was demolished, and SBP was given full autonomy to make and implement regulatory, monetary, and supervisory policies for enhancing the efficiency of the financial institutions. Laws were amended for the recovery of non-performing loans. Capital accumulation was redirected by lowering the interest rate on financial instruments. Commercial banks and NCBs were directed to downsize their staff and close non-profit branches to reduce operational and administrative expenses. In this era, commercial banks and different specialized banks, and microfinance banks started their operation, making the banking sector of Pakistan more efficient by providing financial services in almost every segment and sector of the economy.

Many indicators are devised to assess the health of soundness of any country's financial sector. For example, we can discuss several adequacy ratios, earnings ratios, quality of assets, size of liabilities, and vulnerability indices. However, the discussion of all these indicators is beyond the focus. We shall concentrate on few indicators like liquid liabilities and the credit to the private sector. The core reason for selecting these two indicators is that they are directly connected with economic activities.

It is argued in the literature that liquid liabilities represent an essential indicator of the development of the financial sector development. It reflects the depth of the financial sector. However, most of the time liquid liabilities could not be converted into credit to the private sector. If the government sector starts borrowing from the banking sector to match its expenditures, then the credit for the private sector will be shrunk. In other words, the public sector borrowing crowd out the private sector. So, the liquid liabilities will not contribute to economic growth but generate inflationary pressure on the economy. In this case, liquid liabilities are not a good indicator of FSD. Hence, credit to the private sector will be considered (see figure 1).

The figure can depict an exciting story. The liquid liabilities and credit to private follow each other till 2004. However, both variables decouple after 2004. The liquid liabilities keep rising with some fluctuations, but the private sector's credit decreases from 2004. This was when the public sector borrowing was

increased to match the fiscal deficit. The banking sector chooses to lend to the government due to its safe placement. However, the public sector is not suitable for FSD. It contributes to inflation instead of economic growth.

Interestingly, liquid liabilities show that FSD is improving and, on the other hand, credit to the private sector is posing the other side of the picture. Therefore, one cannot rely on one variable to measure the FSD of the country. This phenomenon is evident in figure 1. There was a notable increase in liquid liabilities from 2010 onward, but credit to the private sector decreased. Therefore, the credit to the private sector is a more relevant indicator. The credit to the private sector does not show a very good picture. It passes through several phases of increase and decrease (See Figure 2).

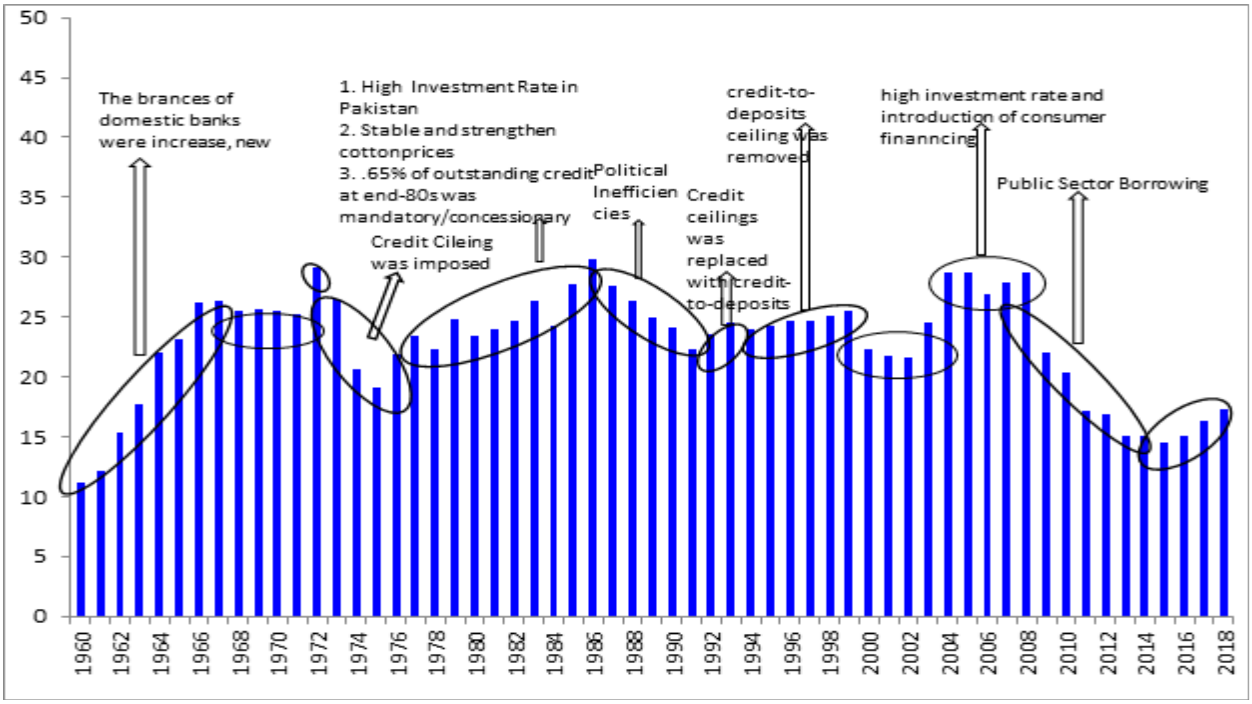

Figure 2: Credit to the private sector (% of GDP)
Source: Author's Calculation and Data is taken from World Development Indicators

4. ANALYTICAL FRAMEWORK AND ESTIMATION METHODOLOGY

Many policy and macro indicators may be referred to, explaining the financial sector activities. For example, McKinnon (1973) discusses that financial repression may hurt FSD and economic activities. Therefore, liberalization is vital to get a well-functioning financial sector. Similarly, Klein and Oliviei (1999); Stulz, (1999); Claessens *et al*. (2001), and Stiglitz (2000) have a stance that liberalization creates a favorable environment for investment by putting pressure for financial sector reforms. Levine (2001) also adds that financial markets liquidity is enhanced due to removing the restriction on international portfolio flows. Then Braun and Raddatz (2006) and Law and Habibullah (2009) by empirically investigating the interest-group-theory (IGT) of Rajan and Zingales (2003) point out that trade liberalization policy is beneficial for the financial sector as a whole instead of a group of incumbents. Badi *et al*. (2009) add that liberalization, even in the loose version, is vital for FSD.

Besides policy variables, the literature suggests that worker's remittance (Chami *et al*. 2003; Giuliano & Ruiz-Arranz, 2009; Azam & Guberi, 2006; Toxopeus & Lensink, 2006; Gupta, 2007), the institutions (La Porta *et al*., 1998; Beck *et al*., 2000; Acemoglu *et al*., 2001; Huang, 2005), and good governance should

also be included in the financial development function. Therefore, keeping all arguments in view, we specify equation 1 following Huang (2005) and Huang (2011).

$$fd_t = \alpha_0 + \beta_0 rem_t + \gamma_0 gdp_t + \theta_0 trade_t + \omega_0 invest_t + \rho_0 prices_t + \lambda_0 X_t + \mu_t \qquad (1)$$

where fd is financial development indicator; rem is worker's remittance, gdp is the size of the economy, $trade$ is trade openness, $invest$ is an investment, $prices$ is a measure of inflation, X is a vector of control variables μ_t is an error term.

The Time-series estimation procedure starts with testing stationarity issues in the data generating process. It is well known that most macroeconomic measures have non-stationarity properties, therefore a well-recognized cointegration technique is named the autoregressive disturbed lag model (ARDL). It is well established in the time-series literature that ARDL has advantages over the other cointegration tests (see Jalil *et al*. 2010). For example, this cointegration technique may be used in the case of I(0), I(1), or any other position between I (0) and I (1) that is partially cointegrated series This approach may take the optimal lag number during the general to the specific process of modelling. Pesaran and Shin (1999) point out that this technique doesn't allow inconsistent estimates in a small data span.

Furthermore, Ang (2010) documents that we explicitly take the exogenous variables in the ARDL framework; therefore, the endogeneity may be tackled. Importantly, we may face a small sample, different integration orders, and endogeneity in Pakistan's financial data. Therefore, ARDL would be a better choice in our case. The ARDL framework may suggest the estimable equation:

$$\begin{aligned}\Delta fd_t = {} & \alpha_0 + \alpha_1 \sum_{i=1}^{p} \Delta fd_{t-i} + \alpha_2 \sum_{i=1}^{p} \Delta rem_{t-i} + \alpha_3 \sum_{i=1}^{p} \Delta trade_{t-i} + \alpha_4 \sum_{i=1}^{p} \Delta invest_{t-i} + \\ & \alpha_5 \sum_{i=1}^{p} \Delta prices_{t-i} + \alpha_6 \sum_{i=1}^{p} \Delta X_{t-i} + \lambda_1 fd_{t-1} + \lambda_2 rem_{t-1} + \lambda_3 trade_{t-1} + \\ & \lambda_4 invest_{t-1} + \lambda_5 prices_{t-1} + \lambda_6 X_{t-1} + \varepsilon_t \qquad (2)\end{aligned}$$

λ's are the long-run parameters on the independent side. The X_t is the vector of some other controlled variables. The short-run dynamics are estimated through an error correction mechanism in the ARDL procedure based on the stationarity data series. If there is a level relationship among the variable existing in a longer run, the following equation will show the short-run results and error correction term.

$$\begin{aligned}\Delta fd_t = {} & \beta_0 + \sum_{i=1}^{p} \delta_i \Delta fd_{t-i} + \sum_{i=1}^{p} \phi_i \Delta rem_{t-i} + \sum_{i=1}^{p} \lambda_i \Delta trade_{t-i} + \sum_{i=1}^{p} \theta_i \Delta invest_{t-i} + \\ & \sum_{i=1}^{p} \eta_i \Delta prices_{t-i} + \sum_{i=1}^{p} \varsigma_i \Delta X_{t-i} + \alpha ECM_{t-i} + U_t \qquad (3)\end{aligned}$$

lower coefficient of ECM implies a lower speed of adjustment of the economy after an exogenous shock.

5. DATA AND VARIABLES

There is no consensus among the researchers for measuring the financial sector. It can be measured through size, structure, and efficiency. King and Levine (1993) employ money supply measured by M2 to nominal GDP ratio representing the financial depth. Nevertheless, Demetriades and Hussein (1996) point out that in developing economies, due to cash-based transactions; the currency in circulation is a significant chunk of the money supply. Therefore, the insinuation of increasing M2 is the monetization of the economy instead of financial depth. Therefore, the variable liquid liabilities (denoted by *Lly*) are a better indicator of the financial sector's deepness. The liquid liabilities mean that the currency in circulation and the deposits in banking institutions and other non-banking financial institutions. However, possibly the deposited savings are not properly allocated for economic activities like the credit extended to the private sector and others. Therefore, the credit to the private sector (denoted by private) that measures the financial sector structure is a better indicator (Beck *et al*., 2000). Levine (1997) proposes another indicator that may be another

measure of the change in developing countries' financial sector structure. It is the ratio of assets of commercial banks to the assets of the central bank (denoted by *btot*) of the country.

It implies that there is no consensus on using a single measure of fd which may truly depict the meaningful picture of the financial sector. Recap the discussion in Figure 1 and Figure 2 as well. Therefore, the present study uses a composite index for the financial sector development developed by the principal component analysis study and other indicators. It combines three indicators *Lly*, private and *btot* through factor analysis. The high correlations among private, *btot*, and *Lly* are evidence that all the indicators carry some standard information. In this situation, Creane *et al*. (2003) suggest the calculation of principal components for generating a single series for all these selected financial indicators.

Table 1: The Construction of FD by Using PCA

Principal Component	Eigenvalues	Percentage of Variance	Cumulative
1	2.5314	0.8115	0.8115
2	0.4231	0.1361	0.9476
3	0.0461	0.0524	1.000
Variable	Factor Loadings	Communalities	Factor Scores
private	0.7246	0.5261	0.3521
btot	0.3113	0.6127	0.3361
Lly	0.5459	0.5621	0.2985

Source: Authors' Calculations

Seventy-one percent of the standardized variation is explained by the first principal component (see Table 1). Therefore, the first principal component is more critical for measuring fd. We also provide the individual contributions of the relevant variables by factor score. The variable private contribute 35 percent in the first principal component, *btot* contributes 36 percent, and *Lly* contributes 28 percent.

The worker remittance comes and is reported into the host country in foreign currency. Therefore, it is multiplied with the exchange rate to get the local currency unit amount. Export plus import to GDP ratio for trade openness is used. For the capital account liberalization (denoted by *cal*) foreign direct investment and foreign portfolio investment over GDP is used following Seetanah *et al*. (2009) and Chin and Ito (2006). The rate of consumer price index change is being used as a proxy for inflation following the standard literature (Seetanah *et al*., 2009; Huang, 2011; Hauner, 2009; Boyd *et al*., 2001). Gross fixed capital formation is taken to proxy the investment indicator following the standard literature. The economy's size is considered an essential determinant of the higher level of financial services (Levine, 1993; & Baltagi *et al*., 2009). Several indicators are available to capture the economy's size like the level and the growth rate of gross domestic product (GDP) and the level of per capita GDP. However, per-capita GDP incorporates the country's GDP and population size. Therefore, we shall use Pakistan's per capita GDP in the local currency unit following Demetriades and Hussein (1996). As McKinnon (1973) points out, financial repression may destroy the growth level by altering the prices of financial instruments, for example, foreign exchange rates and interest rates. Therefore, interest rates (denoted by *mp*) are linked with the size of the financial system. Besides, it reflects monetary policy behaviour conduction as well. All data are taken from the various issues of the Pakistan Economic Survey.

6. EMPIRICAL RESULTS

We start testing stationarity properties through conventional Augmented Dicky Fuller (ADF) unit root test. The test shows that some of the variables are I(1) and some others are I(0), but none of them is I(2).[6] Since

[6] The results of ADF are not presented here keeping brevity in mind. However, these are available on request.

we are using the ARDL methodology for the cointegration among the variables, we are quite comfortable with these results. However, both tests may produce erroneous results in some structural breaks in the data generating process (Perron, 1997). As we have discussed that policy decisions in financial sector reforms may produce some structural breaks of financial sector variables.

The conventional ADF fails to detect unit roots in some structural breaks in the data generating process. In this situation, several bailout packages are suggested by researchers. For example, Perron (1997) allows some exogenous structural breakthrough, a dummy variable in ADF tests. Then Zivot and Andrews (1992) determine the system's breakpoint. Notably, Clemente-Montanes-Reyes (CMR) mentioned in Clemente (1988) proposes a unit root test that allows two different models to capture the structural breaks in the underlined variables' data generating process. The first model captures the sudden change in a variable's data generating process. It is called the additive outliers model (AO). Second measures the gradual shifts in the data generating process and is called the innovational outliers model ((IO). The present study uses the CMR tests to investigate the stationarity property of the data series due to its several advantages. For example, it does not require a priori knowledge of the structural break dates.

Table 2: CMR Unit Root Test

	Innovative (Outliers)				Additive (Outlier)			
Variables	**t-statistics**	**Time Break1**	**Time Break2**	**Decision**	**t-statistics**	**Time Break1**	**Time Break2**	**Decision**
private	5.9286*	1991	1998	I(1)	4.1838*	1986	1998	I(1)
Lly	5.1783*	1991	1996	I(1)	6.9678*	1984	1986	I(1)
btot	4.9818	1983	1989	I(0)	6.9795*	1983	1985	I(1)
fdi	4.4470	1991	1998	I(0)	7.1102*	1995	1998	I(1)
inflation	5.5947	2001	2006	I(0)	8.5023*	2001	2007	I(1)
rem	3.6501	1981	2000	I(0)	6.4516*	1981	1998	I(1)
lend	2.7411	1998	2002	I(0)	5.1492*	1998	2002	I(1)
invest	6.9841*	2001	2007	I(1)	7.8731*	2003	2007	I(1)
gdp	2.3239*	2001	2008	I(1)	6.7372*	1998	2008	I(1)
trade	6.0931*	1998	2002	I(1)	6.9077*	1998	2004	I(1)
cal	1.7217	1992	2000	I(0)	5.1101*	1994	1998	I(1)
debt	3.2921	2000	2006	I(0)	7.7287*	2003	2006	I(1)
deposit	5.4110	1998	2002	I(1)	6.5538*	1998	2005	I(1)

Source: Authors' Calculations

AO model and IO model propose the contradictory model. *rem*, *btot*, *fdi*, *gdp*, *debt*, *cal*, and *deposit* are stationary at level with innovative outlier's model, while additive outlier model proposes that all variables have unit root when sudden structural breaks are allowed. Nevertheless, none of the variables is I(2). This contradictory outcome suggests that the ARDL approach will be appropriate for cointegration analysis even with the structural breaks.

The next step is to test the cointegration among the variables using the ARDL model. The standard ARDL procedure estimates equation 2 through ordinary least square (OLS) for computing the joint F-statistics (see Pesaran & Pesaran, 1997). We shall estimate several different regressions to posit a clear picture regarding the determinant of Pakistani FSD. The comparison of calculated values and critical shows strong evidence of having a long-run relationship among the under-consideration variables.

Next, we estimate the long-run coefficients through the ARDL estimator. Five regression are estimated with the natural log of private as a dependent variable in equation 2. The base model, (regression 1), shows that trade, remittances, and per-capita GDP enter the regression significantly positive. The coefficient 0.2108 of trade implies that the financial sector of Pakistan will improve 0.2108 percent by the increase of

1 percent in the measure of trade openness. The finding is in line with Baltagi *et al*. (2009). Our findings are partially in line with Rajan and Zingales (2003). Rajan and Zingales (2003) study that trade and capital's simultaneous openness is essential for FSD. At the same time, they believed that the openness of one could promote the banking sector in a relatively closed economy.

Table 3: F-Stats for Bounds

	F-statistic	**1 percent critical bounds**		**5 percent critical bounds**		**10 % Critical bounds**	
		I(0)	**I(1)**	**I(0)**	**I(1)**	**I(0)**	**I(1)**
A:				**Credit to Private Sector Model**			
Lag 4	2.8160	3.93	5.23	3.12	4.25	2.75	3.79
Lag 3	6.0244	3.93	5.23	3.12	4.25	2.75	3.79
Lag 2	6.6120	3.93	5.23	3.12	4.25	2.75	3.79
Lag 1	7.1354	3.93	5.23	3.12	4.25	2.75	3.79
B:				**Liquid Liabilities Model**			
Lag 4	2.9656	3.93	5.23	3.12	4.25	2.75	3.79
Lag 3	4.1528	3.93	5.23	3.12	4.25	2.75	3.79
Lag 2	4.5992	3.93	5.23	3.12	4.25	2.75	3.79
Lag 1	7.8892	3.93	5.23	3.12	4.25	2.75	3.79
C:				**Financial Development Index Model**			
Lag 4	1.9137	3.93	5.23	3.12	4.25	2.75	3.79
Lag 3	2.6798	3.93	5.23	3.12	4.25	2.75	3.79
Lag 2	2.9678	3.93	5.23	3.12	4.25	2.75	3.79
Lag 1	5.0909	3.93	5.23	3.12	4.25	2.75	3.79

Source: Authors' Calculations and the critical values are taken from Pesaran *et al*. (2001)

Similarly, remittances positively impact the development of Pakistan's financial sector. Specifically, the remittances coefficient shows that a 1% increase in remittances contributes to a 0.34% increase in the long run. The theoretical literature on the financial sector's determinant suggests that remittance sent through formal channels promotes financial intermediation (Aggarwal *et al*., 2011). It is well recognized that in the case of Pakistan, remittances increased after 9/11 through a formal channel. Therefore, we may say that the worker's remittances have strengthened Pakistan's financial sector, and our findings are in line with Aggarwal *et al*. (2011).

Inflation negatively affects the private credit to GDP but statistically insignificant in a few cases. Theoretically, inflation erodes individuals' purchasing power by creating an environment of uncertainty and shakes producers and consumers (Boyd *et al*., 2001; Aggarwal *et al*., 2011). In our findings, inflation enters significantly negative in all five models and follows earlier empirical and theoretical studies (Aggarwal *et al*., 2011; Boyd *et al*., 2001). Furthermore, the size of the economy enters significantly positive in the regression. The finding is in line with Robinson (1952) theory that finance follows economic growth. Furthermore, our results follow the recent empirical studies like Aggarwal *et al*. (2011), and Baltagi *et al*. (2009).

Then we add investment in regression 2 and the variables of base regression like trade, remittances, per capita GDP, and inflation. It is essential to mention here that investment inclusion does not alter another variable's signs, but only their magnitude changes. Furthermore, investment follows the literature (Huang, 2005; Levine, 1997). The estimated coefficients show that a 1% increase in investment stimulates credit to private by 0.12%. It implies that financial intermediation increases due to an increase in private investment because it pokes external finance.

Table 4: Long Run estimates, Error Correction Term and Diagnostics

Regressors	*The dependent* variable is the natural log of *private*					*The dependent variable is the Financial Development Index*				
	Regression 1	Regression 2	Regression 3	Regression 4	Regression 5	Regression 1a	Regression 2a	Regression 3a	Regression 4a	Regression 5a
Trade	0.2108***	0.1463***	0.0990***	0.1066**	0.1238**	0.4644***	0.1837***	0.4317**	0.3380***	0.1555*
	(0.0481)	(0.0554)	(0.0293)	(0.0497)	(0.0553)	(0.1853)	(0.0554)	(0.1924)	(0.1254)	(0.0858)
Remittances	0.3392***	0.0454**	0.0426	0.2170***	0.1353**	0.1426***	0.1570*	0.2534***	0.1725**	0.1798***
	(0.1031)	(0.0204)	(0.1332)	(0.0862)	(0.0692)	(0.0345)	(0.0873)	(0.0745)	(0.0798)	(0.0330)
inflation	-0.8979	-0.7743*	-0.2284	-0.2089***	-0.3208	-1.1273	-0.9722*	-0.2868	-0.2623***	-0.4028
	(0.6250)	(0.4052)	(0.488)	(0.0700)	(0.1996)	(0.9567)	(0.6160)	(0.1926)	(0.0955)	(0.3958)
GDP	0.8288***	0.1134**	0.2504**	0.1083***	0.0637***	0.0406	0.1423*	0.3143***	0.1359***	0.0800**
	(0.2400)	(0.0503)	(0.1229)	(0.0445)	(0.0256)	(0.0304)	(0.0778)	(0.0883)	(0.0444)	(0.0377)
investment	--	0.1202***	--	--	--	--	0.3509**	--	--	--
	--	(0.0372)	--	--	--	--	(0.1704)	--	--	--
public debt	--	--	-0.0716*	--	--	--	--	-0.3899**	--	--
	--	--	(0.0372)	--	--	--	--	(0.1681)	--	--
cal	--	--	--	0.0755***	--	--	--	--	0.1948	--
	--	--	--	(0.0234)	--	--	--	--	(0.1857)	--
mp	--	--	--	--	-0.0785***	--	--	--	--	0.9862
	--	--	--	--	(0.0142)	--	--	--	--	(0.7426)
Intercept	0.2906*	0.1346**	0.2547***	0.0303***	0.4551	1.3648**	0.7690***	1.3197***	0.9380**	0.8714*
	(0.1489)	(0.0669)	(0.1065)	(0.0123)	(0.2947)	(0.6461	(0.2181)	(0.3705)	(0.4484)	(0.4495)
ECM_{t-1}	-0.2513***	-0.2718***	-0.1282*	-0.1751***	-0.3113**	-0.1924*	-0.2623**	-0.0981***	-0.3071**	-0.2383*
	(0.1001)	(0.0595)	(0.0675)	(0.0602)	(0.1556)	(0.1001)	(0.1321)	(0.0400)	(0.1529)	(0.1056)
Diagnostics (p-values)										
χ^2 *(Serial Correlation)*	0.5028	0.3409	0.2311	0.1567	0.1062	0.3130	0.2802	0.3020	0.1968	0.3340
χ^2 *(Functional Form)*	0.2010	0.1362	0.1192	0.1626	0.1425	0.5230	0.1711	0.3715	0.4187	0.7887
χ^2 *(Normality)*	0.5234	0.3549	0.2406	0.1631	0.1106	0.7155	0.4455	0.2079	0.4809	0.1389
χ^2 *(Heteroscedasticity)*	0.3148	0.2134	0.1447	0.1981	0.1665	0.9527	0.6799	0.8170	0.2319	0.8352

Note: the parentheses carry the standard errors and ***, **, * indicates significance at 1%, 5% and * 10%, respectively.

In regression 3, the measure of investment is replaced by public debt. The literature on FSD argues that public debt negatively impacts the financial sector, especially the banking sector (Ismihan & Ozkan, 2012; Hauner, 2009). Though the banks that hold public debt are profitable, they are less efficient. They decrease financial deepening. In our case, the credit to the private sector decreases by 0.7% due to a 1% increase in public debt. It implies the crowding-out effect and follows standard literature.

Regression 4 consists of capital account liberalization (*cal*) that is the sum of foreign direct investment and foreign portfolio investment over GDP and base model variables. Both are sources of external finance and promoting financial deepening. Capital account liberalization enters positively in the financial development regression. Specifically, a 1 percent increase in capital account liberation promotes the financial sector by 0.07 percent and in line with Law and Habibullah (2009), and Chin and Ito (2006). In the last model monetary policy, the lending rate is taken as the base model's control variable. The lending rate promotes the financial sector that is a credit to the private sector by 0.07 percent.

Short-run estimates state that the lending rate, capital account liberalization, public debt, and investment determine Pakistan's financial sector in the short run.[1] Generally, the error correction term is a vital outcome of the short-run analysis in the context of cointegration. This term reflects the adjustment speed from disequilibrium to equilibrium after an exogenous shock. The estimated models show a considerable variation in the speed of adjustment. Specifically, this term varies from 0.128 to 0.311 percent. However, the term is correct in the sign, which implies that the short-run disequilibrium will be adjusted in the long run. More specifically, 0.128 implies 12.8 percent of the disequilibria of the previous year's shock will be adjusted back to the long-run equilibrium in the current year in Pakistan's financial sector.

As mentioned earlier, we shall replace the credit to the private sector with an index (*fd*) calculated based on principal component analysis (PCA). The main objective of this is to get the robustness of our estimated model. Aziz and Duenwald (2002) point out that the financial sector estimates are sensitive to the financial sector measures. Furthermore, two different indicators may pose a different picture, as mentioned earlier. Therefore, this exercise will serve as a sensitivity analysis as well. It is evident from table 4, from regression 1a to regression 5a; the results do not alter despite the change of the financial sector's measure on the dependent side.

The regressions pass through some important diagnostic tests. The p-values are more extensive than 10 percent in all cases. This implies that the null hypothesis of no autocorrelation, no heteroskedasticity, errors are normally distributed, and correct functional forms are accepted. Furthermore, we use the cumulative sum (CUSUM) and cumulative sum of the square statistic (CUSUMSQ) given by Brown *et al*. (1995) to test the stability of estimates given by the ARDL estimator. We find that CUSUM and CUSUMSQ statistics are well within the critical bounds imply that the estimates are stable.[2]

7. CONCLUSION

This article explores Pakistan's financial sector's determinants by using measures like liquid liabilities and credit to the private sector as representative indicators of FSD. Furthermore, the financial development index is constructed by principal component analysis and is utilized as an alternative candidate. We use several unit root tests with and without structural breaks to get the true picture of the data series data generating process. These tests suggest that some of the variables are I(0), and some are I(1). Therefore, we use ARDL to establish a long-run relationship among the variables and estimate the error correction model.

[1] However, we are not presenting the table of short run keeping brevity in view.
[2] The graphs are not presented for brevity purposes. These are available on the request.

Our estimates are in line with the theoretical and empirical literature. Trade openness, capital account liberalization, per capita GDP, investment, and worker's remittances positively impact the financial sector development of Pakistan. On the other hand, inflation and public debt negatively affect financial sector development regression. Therefore, the article suggests that policymakers should focus on trade liberalization, capital account liberalization, and remittances to developing the country's financial sector. Similarly, inflation plays a negative role in the financial sector; therefore, it must be addressed. Since public debt is hurting the financial sector development, an independent and competitive banking system should be encouraged.

Acknowledgment
We are thankful to anonymous reviewers of the paper for the valuable comments which helped us to improve its quality.

Funding Source:
The author(s) received no specific funding for this work.

Conflict of Interests:
The authors have declared that no competing interests exist.

REFERENCES

Acemoglu, D., Johnson, S., & Robinson, J.A. (2001). The colonial origins of comparative development: An empirical investigation. *American Economic Review*. 91, 1369-1401.

Aggarwal, R., Asli, D., & Peria, M.S.M. (2011). Do remittances promote financial development? *Journal of Development Economics*. 96, 255-264.

Ang, J. B. (2010). Determinants of private investment in Malaysia: What causes the post crisis slumps? *Contemporary Economic Policy*. 28, 378-391.

Arif, I. & Rawat, A.S. (2019). Trade and financial openness and their impact on financial development: Evidence from South Asian economies, *South Asian Journal of Business Studies*, 8, 26-39.

Azam, J., & Guberi, F. (2006). Migrant remittances and the household in Africa: A review of evidence. *Journal of African Economies*, 15, 426–462.

Aziz, J., & Duenwald, C. (2002). Growth-Financial intermediation nexus in China, IMF working paper 02/194 (Washington: International Monetary Fund)

Baltagi, B.H., Demetriades, P. O., & Law, S.H. (2009). Financial development and openness: Evidence from panel data. *Journal of Development Economics*. 89, 285-296.

Bagehot, W. (1873). *Lambord Street*. Homewood IL: Richard D. Irwin.

Batuo, M., Mlambo, K. & Asongum, S. (2018). Linkages between financial development, financial instability, financial liberalisation and economic growth in Africa. *Research in International Business and Finance*, 45, 168–179.

Beck, T., Asli, D., & Levine, R. (2000). A new database on financial development and structure. *World Bank Economic Review*. 14, 597-605.

Beneivenga, V.R., Smith, B.D., & Starr, R.M. (1999). Financial intermediation and endogenous growth. *Review of Economic Studies*. 58, 195-209.

Benczur, P., Karagiannis, S., & Kvedaras, V. (2019). Finance and economic growth: Financing structure and non-linear impact. *Journal of Macroeconomics*.

Bittencourt, M. (2011). Inflation and financial development: Evidence from Brazil. *Economic Modelling*. 28, 91-99.

Braun, M., & Raddatz, C. (2008). The politics of financial development: Evidence from trade liberalization. *The Journal of Finance*. 63, 1469-1508.

Brown, R.L., Durbin, J., & Evans, J.M. (1995). Techniques for testing the constancy of regression relations over time. *Journal of Royal Statistical Society*. 37, 149-163.

Boyd, J.H., Levine, R., & Smith, B. (2001). The impact of inflation on financial sector performance. *Journal of Monetary Economics*. 47, 221-248.

Caballero, R., & Krishnamurthy, A. (2001). International and domestic collateral constraints in a model of emerging market crises. *Journal of Monetary Economics*.48, 513-548.

Carranza, L., Galdon-Sanchez, J.E., & Biscari, J. (2006). Financial development and the asymmetry of monetary policy. Working Paper, Universidad de Navarra http://dx.doi.org/10.2139/ssrn.895163

Chami, R., Fullenkamp, C., & Jahan, S. (2003). Are immigrant remittance flows a source of capital for development? *IMF Staff Papers*. 52, 55-81.

Chin, M. D., & Ito, H. (2006). What matters for financial development? Capital controls, institutions, and interactions. *Journal of Development Economics*. 81, 163-192.

Claessens, S., Asli, D., & Huizinga, H. (2001). How does foreign entry affect domestic banking markets? *Journal of Banking and Finance*. 25, 891-911.

Clemente, J., Montanes, A., & Reyes, M. (1998). Testing for a unit root in variables with a double change in the mean. *Economics Letters*. 59, 175-182.

Creane, S., Goya, I.R., Mobarak, M., & Sab, R. (2003). Financial development and economic growth in the Middle East and North Africa finance and development. 4(1). *A Quarterly Magazine of the IMF*.

Demetriades, P.O., & Hussein, K.A. (1996). Does financial development cause economic growth? Time-series evidence from sixteen countries. *Journal of Development Economics*. 51, 387-411.

Diamond, D.W., & Dybvig, P.H. (1983). Bank runs, deposit insurance, and liquidity. *Journal of Political Economy*. 91, 401-419.

Friedman, M. (1968). The role of monetary policy. *American Economic Review*. 58, 1-17.

Fry, M. J. (1995). Money, interest and banking in economic development, 2nd edition, Johns Hopkins University Press, London.

Fufa, T., & Kim, J. (2018). Stock markets, banks, and economic growth: Evidence from more homogeneous panels. *Research in International Business and Finance*. 44, 504-517.

Giuliano, P., & Ruiz-Arranz, M. (2009). Remittances, financial development, and growth. *Journal of Development Economics*. 90, 144-152.

Greenwood, J., & Smith, B. (1997). Financial markets in development, and the development of financial markets. *Journal of Economic Dynamics and Control*. 21, 145-181

Greenwood, J., & Jovanovic, B. (1990). Financial development, growth, and the distribution of income. *Journal of Political Economy*. 98, 1076-1107.

Gupta, S., Patillo, C., & Wagh, S. (2007). Impact of remittances on poverty and financial development in Sub-Saharan Africa. IMF Working Paper No. 07/38. International Monetary Fund, Washington.

King, R.G., & Levine, R. (1993). Finance and growth: Schumpeter might be right? *Quarterly Journal of Economics*. 108, 717-737.

Hauner, D. (2009). Public debt and financial development. *Journal of Development Economics*. 88, 171-183.

Haiss, P., Juvan, H., & Bernhard, M. (2016). The impact of financial crises on the finance–growth relationship: A European perspective. Economic Notes: *Review of Banking. Finance and Monetary. Economics*. 45, 423–444.

Huang Y. (2005). What determines financial development? *Bristol economic discussion Paper No: 05/580*; University of Bristol.

Huang, Y, (2010). Political institutions and financial development: An empirical study. *World Development*, 38, 1667-1677.

Huang, Y. (2011). Private investment and financial development in a globalized world. *Empirical Economics*. 41, 43-56.

Ismihan, M., & Ozkan, G. (2012). Public debt and financial development: A theoretical exploration. *Economic Letters*. 115, 348-315.

Jalil, A., Feridun, M., & Ma, Y. (2010). Finance-growth nexus in China revisited: New evidence from principal components and ARDL bounds tests. *International Review of Economics and Finance*, 19, 189-195.

Klein, M., & Olivei, G. (1999) Capital account liberalization, financial depth and economic growth. Federal Reserve Bank of Boston, Working Paper 99-6.

Khan, H., Khan S, & Zuojun F. (2020). Institutional quality and financial development: Evidence from developing and emerging economies. *Global Business Review*. January 2020. doi:10.1177/0972150919892366

La Porta, R., Lopez-de-Silanes, F., Shleifer, A., & Vishny, R.W. (1998). Law and finance. *Journal of Political Economy*. 106, 1133-1155.

Law, S. H. & Habibullah, M. S. (2009). The determinants of financial development: Institutions, openness and financial liberalization. *South African Journal of Economics*. 77, 45-58.

Levine, R. (1993). Quality ladders, growth, and R&D: An assessment from US industry: A comment. *Carnegie-Rochester Conference Series on Public Policy* 38(1) 275-278

Levine, R. (1997). Financial development and economic growth: Views and agenda. *Journal of Economic Literature*. 35, 688-726.

Levine, R. (2001). Bank-based or market based financial system: Which is better? *Journal of Financial Intermediation*. 1-4.

Levine, R., & Renelt, D. (1992). A sensitivity analysis of cross-country growth regressions. *American Economic Review*. 82, 942-63.

Loayza, N., Ouazad, A., & Ranciere, R. (2017). Financial development, growth, and crisis is there a arade-off? *Policy Research Working Paper 8237*; World Bank Group, Development Research Group, Macroeconomics and Growth Team: Washington, DC, USA, 2017, 1–40.

Lucas, R. E. (1988). On the mechanics of economic development. *Journal of Monetary Economics*. 22, 3-42.

Mayer, C. & Sussman, O. (2001). The assessment: Finance, law, and growth, *Oxford Review of Economic Policy*, 17(4), 457-466.

McKinnon, R.I. (1973). *Money and Capital in Economic Development*, Brookings Institution, Washington, DC.

Modigliani, F. & Perotti, E.C. (1998) Corporate law enforcement and the development of security markets. *Managerial and Decision Economics*, 18,519-528.

Patrick, H.T. (1966). Financial development and economic growth in underdeveloped countries. *Economic Development and Cultural Change*, 14, 174–8.

Perron, P. (1997). Further evidence on breaking trend functions in macroeconomic variables. *Journal of Econometrics*. 80, 355-385.

Pesaran, M. H. & Pesaran, B. (1997). *Working with Microfit 4.0: Interactive Econometric Analysis*, Oxford University Press, Oxford.

Pesaran, M. H. & Shin, Y. (1999). An autoregressive distributed lag modelling approach to cointegration analysis, in econometrics and economic theory in the 20th century: The Ragnar Frisch centennial symposium, (Ed.) S. Storm," Cambridge University Press, Cambridge:1-33

Pesaran, M.H, Shin, Y. & Smith, R. (2001). Bounds Testing Approaches to the Analysis of Level Relationships, *Journal of Applied Econometrics*, 16, 289-326.

Rajan, R., and L., Zingales, (2003). The great reversals: The politics of financial development in the twentieth century. *Journal of Financial Economics*, 69, 5-50.

Robinson, J. (1952). The generalization of the general theory, in Violet, J. (ed.), The Rate of Interest, and Other Essays, Macmillan, London: 67-142.

Saca, N. & Caceres, L. (2006). What do remittances do? Analyzing the private remittance transmission mechanism in El Salvador. IMF Working Papers. 06. 10.5089/9781451865103.001.

Schumpeter, J. A. (1911). *The Theory of Economic Development*. Oxford University Press, Oxford.

Seetanah, B., Ramessur, S. & Rojid, S. (2009). Financial development and economic growth: New evidence from a sample of island economies. *Journal of Economics Studies*. 36, 124-134.

Selçuk, A. (2019) Do industrialization, democracy, and financial openness promote financial development? Evidence from Turkey, *Turkish Studies*, 20(5), 708-727.

Shaw, E.S. (1973). *Financial Deepening in Economic Development*. New York: Oxford University Press.

Stiglitz, J. (2000). Capital market liberalization, economic growth, and instability. *World Development*, 28, 1075-1086.

Stulz, R. (1999). Globalization, corporate finance and the cost of capital. *Journal of Applied Corporate Finance*. 12, 8-25.

Svaleryd, H. & Vlachos, J. (2002). Markets for risk and openness to trade: How are they related. *Journal of International Economics*. 57, 369–395.

Toxopeus, H. S. & Lensink, R. (2006). Remittances and financial inclusion in development. *WIDER Research Paper*, 2007/49.

Voghouei, H., Azali, M. & Jamali, M. (2011). A survey of the determinants of financial development. *Asian-Pacific Economic Literature*. 25, 1-20.

Yang, B. (2011). Does democracy foster financial development? An empirical analysis. *Economics Letters*. 112, 262–265.

Zivot, E. & D. Andrews, W. K. (1992). Further evidence on the great crash, the oil-price shock, and the unit-root hypothesis. *Journal of Business & Economic Statistics*. 10, 251-270.

Žukauskas, V. & Hülsmann, J.G. (2019). Financial asset valuations: The total demand approach. *A Quarterly Review of Economics and Finance*. 72, 123-131.

Kashmir Economic Review
ISSN(P): 1011-081X, ISSN(E): 2706-9516
http://www.ker.org.pk

Investigating the Impact of Fiscal Decentralisation on Health Sector: A Case of Pakistan

ABSTRACT

An important determinant of improved quality of life is the health sector. Pakistan, being a developing country, lags on various health indicators and therefore, this study discusses the health sector in Pakistan. As the health sector is a devolved subject, therefore, the study explores the impact of fiscal decentralization on important health sector indicators. National data ranging from 1974-2009 was used to analyse the important health indicators in Pakistan. Analysis indicates that the health sector remained neglected over the period. To a surprise, a negative long-run cointegrating relationship was found for federal transfers on health expenditures at the national level. Hence, provincial autonomy during the period of analysis could not bring the desired improvement in the health sector. Nevertheless, the study highlights that federal transfers to provinces do have social implications.

AUTHORS

Iftikhar Ahmad*
Assistant Professor, Pakistan Institute of Development Economics, Islamabad, Pakistan
Author's Contributions: 1, 2, 3, 4, 5, 6
iftikhar@pide.edu.pk
https://orcid.org/0000-0003-1971-4241

Miraj ul Haq
Assistant Professor, IIIE, International Islamic University, Islamabad, Pakistan
Author's Contributions: 2, 4, 6
mirajulhaq@iiu.edu.pk

Jangraiz Khan
Visiting Faculty, Institute of Management Studies, University of Peshawar, Peshawar, Pakistan
Author's Contributions: 2, 4, 6
economist95@hotmail.com
https://orcid.org/0000-0003-4660-8495

Keywords
Health Sector, Pakistan, Provincial tax revenues, Fiscal Decentralisation

JEL Classification
I18, I19, H30, H39

Please cite this article as:
Ahmad, I., Haq, M., & Khan, J. (2020). Investigating the impact of fiscal decentralisation on health sector: A case of Pakistan, *Kashmir Economic Review*, 29(2), 31-44.

*** Correspondence author**

Author's contribution in the article: 1- Conceived and designed the analysis, 2- Reviewed and compiled the literature, 3- Collected the data, 4- Contributed data or analysis tools, 5- Performed the analysis, 6- Wrote the paper, 7- Financial support for the conduct of the study, 8-Other

1. INTRODUCTION

Devolution brings in local preferences in policymaking thus caters to the basic needs of a locality, locally. Local representatives being located near to the people are often considered more informed about local needs and territorial requirements as compared to the central planner. Therefore, received literature on the topic advocates that decentralisation would make the expenditures reflective of local needs, and thus improved social indicators are expected to take place. Local representatives from different jurisdictions could learn from the success stories. There is a greater chance to imitate the innovative activities related to revenue generation, local spending, and development projects; and to modify these policies according to local preferences and territorial characteristics. Hence, decentralisation potentially improves resource utilisation, capacitates the local population, and increases productivity by providing an opportunity to contribute (Oates, 1972 and 1999). Hatfield and Kosec (2013) discuss that inter-jurisdictional competition results in higher efforts to compete for investment and better human resources and thus increases productivity.

Decentralisation also helps in defining roles and responsibilities for each tier of the government and helps protect co-sharing of responsibilities (Martinez-Vazquez, 2001). Where we know that, co-sharing cause ambiguity in the determination of the exact responsibilities, which causes a delay in implementation and results in economic inefficiency due to the mismanagement of resources (Vo, 2010). To obtain fruitful results, a well-conceived system of checks and balances is explicitly mentioned in the literature, as the necessary condition.

Hence, despite initial discussion in the literature contemplating the role of decentralisation on economic growth (Ahmad, 2020; Davoodi & Zou, 1998; Thornton, 2007; Woller & Pillips, 1998; Xie *et al*., 1999; Zhang & Zou, 1998), the emphasis has now shifted away from the analysis of fiscal decentralisation (FD) and macroeconomic indicators (like economic growth, inflation, and budgets deficit and public debt). Researchers are now interested in the investigation of the human face of fiscal decentralisation i.e. its impact on education, health, sanitation, and alike local services (Khan *et al*., 2019; Ahmad, 2016; Ahmad *et al*., 2016).

With the emergence of Second-Generation Theories of Fiscal Federalism (SGFF), the discussion has diverted from direct positive effects (between FD and economic growth) to the potential hindrances attached, through which the impact of decentralisation can be compromised (Khan *et al*., 2019; Weingast, 2014; Vo, 2010).[1] Similarly, it is important to look at the indirect channels of decentralisation impacting service provision, which in turn could help to accelerate economic growth.

With decentralisation, public goods provision is assumed to improve due to people focussed public spending. This also leads to the selection of better projects, which are consistent with local conditions and accommodate public preferences. Moreover, subnational revenues raised through domestic resources make the local setup more responsible and relatively more answerable to local communities, hence is expected to result in greater efficiency. Hence, combining decentralisation theorem with local revenue-raising, local governments are assumed to channelize local resources to the social sector. In this connection, the health sector is the important sector that needs to be assessed for its connection with decentralisation, therefore, this study analyses the impact of fiscal decentralisation on health sector indicators in Pakistan.

2. MATERIAL AND METHODS

The available literature on the health sector exhibits its importance and the researcher's interest in the topic. Different health outcome indicators like infant mortality rate, life expectancy, and child immunisation were

[1] Like governance issues, corruption, capacity gap, race to the bottom, flypaper effect etc.

used to analyse the effects of decentralisation on the health sector. Focusing on Pakistan, this study estimated the effects of fiscal decentralisation on various health sector indicators, and results are assessed thereafter to infer accordingly.

Fiscal decentralisation at the local level is analysed both in the form of local autonomy in decision making (own-source revenues) as well as by analysing the effects of fiscal capacity (federal transfers), at provincial levels. Decision-making autonomy helps subnational governments (SNGs) in better targeting, while federal transfers enhance the provincial fiscal capability to serve the people.[2] In brief, the empirical investigation is dedicated to the analysis of the effects of fiscal decentralisation on the health sector in terms of both health spending and health outcomes.

2.1 Theoretical Model and Determinants of Public Health Expenditures

This study builds upon the models and analysis developed in the existing literature (including Uchimura & Jütting, 2009; Jiménez & Smith, 2005; Jiménez-Rubio, 2011 a, b; Khaleghian, 2004; Robalino *et al*., 2001) and applies it for Pakistan. Given the literature, the health sector indicators can be analysed for their relationship with decentralisation.[3] The basic hypothesis in these studies is that health outcomes are determined by the political, economic, social, and demographic characteristics of the country. The section below explains each equation in greater detail.

(i) Health Input Equation

Pubic health care expenditure is the prime input in ensuring basic health facilities. It has an important bearing on the existing health facilities while it also determines their future availability. Therefore, we will start with per capita total health expenditure which can be modeled as equation (1).[4]

$$Hepc_t = \alpha_{11} + \theta D_t + \beta_{11} Y_t + \beta_{12} FD_t + \beta_{13} GE_t + \beta_{14} Lfp_t + \beta_{15} Pgr_t + \beta_{16} Aid_t + \varepsilon_{1t} \quad (1)$$

where Hepct is the per capita consolidated health expenditure, denoting the basic health input. Equation (1) will isolate the immediate effects of fiscal decentralisation on the health sector. Along with fiscal decentralisation, other determinants of health expenditures include the overall level of economic prosperity, general government expenditure policy, population demographics, and foreign aid. Lastly, ε_t represents the error term in each equation while the subscript t denotes time i.e. t = 1, 2, . . . , 36.

The discussion below summarises each of the explanatory variables for its effect on total per capita health expenditures (*Hepc*), as indicated in Equation (1).

Per Capita Gross Domestic Product (Y): Among the explanatory variables one of the important determinants of health spending is the per capita Gross Domestic Product (GDP).

Fiscal Decentralisation (FD): As the main focus of the study is to analyse the effects of fiscal decentralisation, provincial local revenues (i.e. Provincial tax and Provincial non-tax revenue) and federal transfers were used (as a ratio to total government revenues) to assess its effects (Ahmad, 2020). The theory of decentralisation suggests that efficiency gains can be achieved through localisation and it can help in the provision of public goods by local needs and preferences because local setup has better channels of information (as these are located near to the people) to get informed about local demands. Due to a large number of influences on the health sector, one cannot rule out the possibility of either positive or negative

[2] That constitute lion share of provincial budgets in Pakistan

[3] In addition, we also benefited from the studies which had explicitly analysed the determinants of different health care indicators including Abbas and Hiemenz (2011), Toor and Butt (2005), Di Matteo (2005), Freeman (2003), Di Matteo and Di Matteo (1998) and Siddiqui *et al*. (1995).

[4] Including both the current expenditure and development expenditure

effects of fiscal decentralisation on total health expenditures. In the absence of any fundamental change in the public health investment in Pakistan, fiscal decentralisation captures the commitment of the subnational levels to health spending and there are possibilities that overall spending on health may increase if local governments start to spare even more money on the health provision. However, if the decentralised setup is not interested in higher spending but instead achieves better targeting, avoids unnecessary spending, eliminates duplication of services, and can cap any loopholes in the spending chains, decentralisation can have a negative effect on the overall health spending. Therefore, fiscal decentralisation contains important information and is expected to summarise the behaviour of subnational governments, over time, with special reference to health expenditures.

General Government Expenditure (GE): Similarly, policy regarding general government expenditure is also very important and it is used to proxy the government's commitment to the health sector.

Labour-force Participation Rate (*Lfp*): This variable is a proxy for the affordability of the people. We assume that if there are more people able to work in the economy (that is operating at the natural rate of unemployment) this can probably increase the chances to afford to pay for the private health facilities.[5]

Population Growth Rate (Pgr): The demographic characteristics of the country also play an important role in determining total health expenditure. If population growth is on the rise, the government has to increase its unavoidable spending otherwise, the availability of health facilities, on average, will deteriorate.[6]

Foreign Aid (Aid): Foreign aid from various donor agencies also plays an important role, as these are intended to supplement governments' given efforts. Foreign aid is expected to increase health expenditures because these funds should lead to the initiation of new projects, which need certain efforts from the grant receiving country as well. However, if countries start to replace government spending with foreign aid (instead of supplementing it) then it would lead to negative effects, and it is important to know the exact effects in Pakistan.

Having discussed equation (1) that elaborated the model for the effects of fiscal decentralisation on health expenditures, the next sub-section discusses the health outcome variables. Health expenditures can give us a hint about the immediate reaction of subnational governments to the health sector, but even more important is to analyse the effects of fiscal decentralisation on actual health facilities on the ground. Thus the next sub-section will enable us to identify the service provision aspects of fiscal decentralisation more elaborately.

(ii) Health Outcome Equation

Finally, the infant mortality rate (*imr*) is used to determine the long-run effect of fiscal decentralisation policy on health outcomes. This measure will report the ultimate effect of fiscal decentralisation policy on the health sector in Pakistan. Equation (2) summarise the situation as below.

$$imr_t = \alpha_{21} + \beta_{21} Hepc_t + \beta_{22} FD_t + \beta_{23} Bedtp_t + \beta_{24} Lfp_t + \beta_{25} Aid_t + \beta_{26} Fenrl_t + \varepsilon_{2t} \quad (2)$$

where *imr* is the dependent variable and represents infant mortality rate (per 1000 live births). The important control variables are discussed below.

***Hepc*:** indicates consolidated public health expenditure in per capita terms which contains both the development as well as non-development expenditures. Infant mortality can be effectively reduced by

[5] During the period under analysis (1974-2009) the average rate of unemployment was 4.88 percent

[6] Expenditure on lady health workers program, mother/childcare centres and immunisation campaigns

ensuring appropriate vaccination and achieving better food and hygiene for children, therefore consolidated health spending will isolate the effects of federal government contribution in reducing *imr*.

FD: indicates the variable of interest which is represented by the three proxies for fiscal decentralisation as discussed before.

***Bedtp*:** is used to proxy the health infrastructure facilities in Pakistan and is represented by the hospital bed availability. Better health facilities are assumed to help in curbing health issues and would help in saving human life, including those of infants as well.

***Lfp*:** Moreover, private health care services are quite important in Pakistan, but due to lack of data, the labour force participation is used as a proxy for affording private health facilities.

Aid: International donors contribute to various programs that are aimed at the improvement of public health, in general, and childcare, in particular (e.g. immunisation and polio reduction campaigns). Therefore, aid represents foreign aid in per capita terms from UNICEF and is included in the model to evaluate its effects on *imr*.

***Fenrl*:** Lastly, female education plays a very important role in ensuring better food and hygiene situations for and from 'to-be mothers' and it has a direct effect on infant's health. In the absence of data on female literacy, we have used Female primary school enrolment (in thousands) to represent female education.

To sum up, the given health sector indicators will enable us to find out the effects of fiscal decentralisation on the health sector in Pakistan, overtime.

2.2. Data Availability

For this study, the national data set consists of times series observation for 36 years i.e. from 1974-2009.[7] Data were collected from many sources including the World Bank, Pakistan Economic Survey (GoP), State Bank of Pakistan (2005, 2010), and Annual Budget Statements. Table 1 summarise the definitions and sources of the stated variables.

Table 1: Variables names, definitions and sources of data

Variable	Name	Definition	Source
Health Expenditures	*Hepc*	Per capita real health spending (consolidated spending by federal and provincial governments)*	GoP 1995, 2010, PSYB, 2009
Provincial own source revenues	*Fdtax*	Provincial tax revenue ratio**	SBP (2005); GoP (Various issues)
Provincial local revenues	*Fdloc*	Provincial tax + non-tax revenue ratio**	-do-
Federal transfers	*Fdtrans*	Federal transfers to provinces ratio**	-do-
Economic prosperity	*Y*	Per capita GDP (at constant prices)	WDI, World Bank
Government spending	*Ge*	General government expenditures (expressed as a ratio to GDP)	-do-
Labour force participation	*Lfp*	Labour force participation rate	WDI, World Bank, GoP (Various issues)

[7] Due to the 18th amendment, coupled with 7th NFC award in 2010, there is structural break in the data. The Provinces enjoy unprecedented provincial autonomy following 2010, therefore the period for undertaking long run analysis is restricted till 2009 to single out the impact of fiscal decentralisation given the consistent constitutional framework

Table 1 *Continued*…

Urbanisation	*Urb*	The ratio of urban to the total population	-do-
Population growth	*Pgr*	Population growth	WDI, World Bank
Foreign Aid (by UNICEF)	*Aid*	Per capita Foreign Aid (by UNICEF)	-do-
Health infrastructure	*Bedtp*	Number of hospital beds available per (000) population	-do-
Infant mortality	*Imr*	Infant mortality rate per 1000 live births	WDI, World Bank
Female literacy	*Fenrl*	Female primary school enrolment (in thousands)	SBP, 2005

Note: * expressed in real terms using the GDP deflator,[8] ** Fiscal decentralisation measures were expressed as a ratio to total government revenues

2.3 Unit Root Test

The ADF test results are presented in Table 2, containing the set of variables that were used in this study. For each variable, a final number of lags was selected with AIC criteria and is shown in parenthesis. The test results indicate that most of the variables were non-stationary at levels except *doctp* which was level stationary while the other four i.e. *urb*, *pgr*, *aid*, and *imr* were trend stationary. Hence, following the results for variables at levels, ADF test was applied to variables in first differences, and all were found to be stationary. In brief, results indicate that the data set contains *mix* of variables where some are level and trend stationary while the rest were integrated of order one.

Table 2: ADF Results for Variables under Consideration

Variable	τ - ADF with Constant	τ - ADF with Constant and Trend	Variables	τ - ADF with Constant
He	-2.542(1)	-----	Δ *he*	-3.715**
fdtax	-2.850(2)	-----	Δ *fdtax*	-5.254**(1)
fdloc	-2.767(2)	-----	Δ *fdloc*	-3.946**(2)
fdtrans	-0.9914	-----	Δ *fdtrans*	-4.745**
Ge	-1.865(2)	-----	Δ *ge*	-2.988*(1)
Y	-2.011	-----	Δ *y*	-4.367**
Lfp	-1.216	-----	Δ *lfp*	-5.357**
Urb	-----	-1.915	Δ *urb*	-2.192
Pgr	-----	-3.265	Δ *pgr*	-5.485**(1)
Aid	-----	-3.041	Δ *aid*	-6.484**
Bedtp	-1.856	-----	Δ *bedtp*	-5.041**
Imr	-----	-3.046	Δ *imr*	-2.966*(2)
Fenrl	-0.7208	-----	Δ *fenrl*	-6.558**

Note: All variables were expressed in log form, indicated by lower case letters

3. ESTIMATION

The cointegration technique is used to investigate the long-run relationship between public health indicators and fiscal decentralisation. As the data span is 36 annual observations only, therefore, to avoid spurious results and to investigate the long-run relationship among the variables, it is optimal to adopt the single equation approach to enquire long-run cointegrating relationship. Furthermore, results for the unit root test suggest that equations contain variables that are integrated of different orders i.e. I(1) and I(0), therefore, the ADL approach by Kiviet and Phillips (1992) was followed.

[8] GDP deflator (year 2000 as base) was used due to the non-availability of appropriate deflator for Medicare

Keeping in view the limited number of observations in this study, a two-stage procedure was used for estimation. Firstly, for each of the health indicators, the general ADL model was estimated (without the fiscal decentralisation variables) and a cointegration test was conducted to establish the basic relationship. Once evidence favours the existence of long-run cointegrating relations, the fiscal decentralisation measures were incorporated in the ECM representation to deduce the short and long-run effects. This procedure helps in mitigating chances of rejecting a true cointegrating relationship, due to a large number of explanatory variables in the limited data set. For each equation, time trend was also considered for inclusion to capture the trend factor (if any). Lastly, it is important to mention that all the variables were expressed in log form.

In a data-scarce situation, it is very important to make the best use of available data points. Therefore, the General-to-specific (Gets) model selection procedure was applied (Krolzig & Hendry, 2001; Hendry and Krolzig, 2003 & 2005). Once the congruent parsimonious 'specific' model is obtained (for the given health indicator), the Kiviet and Phillips (1992) test for cointegration was conducted to examine the existence of a long-run relationship. Upon the confirmation of the long-run relationship, at the second stage, a similar approach was followed for the ECM model where the fiscal decentralisation measures were then incorporated one by one.[9] Drawing upon the earlier contribution from (Hoover & Perez, 1999; Krolzig & Hendry, 200; Hendry & Krolzig, 2003, 2005), Doornik (2009) developed an improved version of PC automation for 'Gets' approach called 'Automatrics', which is used for estimation in this study. Various misspecification tests including error autocorrelation (AR), heteroscedasticity (ARCH, *hetero*), non-normality, and functional form misspecification test (RESET) were applied to get reliable results.

4. EMPIRICAL RESULTS

The focus of the discussion remains on the signs and significance of the variables. This section presents the empirical results, its interpretation, and conclusion.

4.1. Results for Total Health Expenditure Model

As discussed, this section comprises of two parts. As the first stage, the existence of a long-run relationship is investigated for the health expenditure model. Once the cointegration is established, the next sub-section elaborates the signs and significance of the variables.

4.1.a Evidence for the Existence of LR Relationship

The first stage results for the general and specific ADL model are not presented here and we only report the final ECM results as shown in Table 3. The Gets approach results in the exclusion of one explanatory variable namely government expenditures (*ge*). Thus the final specific ADL model for health expenditures regression contains *y*, *lfp*, *pgr*, and *aid* along with the lagged levels of dependent variable i.e. *hepc*. For a given specific model, the cointegration test-statistic "-5.64" is highly significant and indicates the existence of a long-run relationship between health expenditure and given variables. The *PcGive* unit root test (representing cointegration test by Kiviet and Phillips, 1992) is highly significant at a 1 percent level of significance. Hence, with the given data and analysis, there is strong evidence for the existence of a long-run relationship between per capita total public health expenditure and the given explanatory variables. Once there is enough evidence about the long-run relationship and the redundant regressors are eliminated, it is now possible to add the fiscal decentralisation measures into the ECM representation (Equation 3) of the specific ADL model to disentangle the short-run and long-run effects of fiscal decentralisation.

$$\Delta hepc_t = \nu + \delta t + \sum_{e=1}^{m} \beta_e \Delta hepc_{t-e} + \sum_{f=1}^{n} \beta_f \Delta y_{t-f} + \sum_{h=0}^{q} \beta_i \Delta pgr_{t-i} + \sum_{j=0}^{r} \beta_j \Delta aid_{t-j} + \sum_{k=0}^{s} \beta_k \Delta fd_{it-k} + \gamma_1 hepc_{t-1} + \gamma_2 y_{t-1} + \gamma_3 pgr_{t-1} + \gamma_4 aid_{t-1} + \gamma_5 fd_{it-1} + \varepsilon_t \quad (3)$$

[9] Which was based on the congruent parsimonious ADL model, obtained in first stage

Table 3 contains a result for the 'specific' ECM models for *hepc*, where results for each of the three fiscal decentralisation measures are presented in separate columns.[10] Furthermore, it is important to mention that although the *Gets* approach was used, it was only allowed to select the general determinants from the model, making sure not to delete the coefficients for the variable of interest (which were handled manually following the Gets approach).[11] This procedure provides the opportunity to comment upon the signs and significance of the coefficients for fiscal decentralisation measures.

As seen in Table 3, results for the respective ECM representation are also in conformity and validate the estimation procedure. The lagged level dependent variable i.e. *hepc_1* represents the error correction term and is highly significant with comparable estimates for three models. The error correction terms range from "0.66" to "0.69" which indicates speedy recovery. This also validates the existence of a long-run relationship for the given set of variables and shows that with each period following a shock, *hepc* will converge to its long-run steady state at a speedy rate.

4.1.b Coefficient Interpretation for the Health Expenditure Model

Once the given long-run relationship between fiscal decentralisation and health expenditure is validated, this section contains a discussion about the signs and significance of different determinants of health expenditure in Pakistan. To start with, Model 1 in Table 3 shows the effects of the first fiscal decentralisation proxy i.e. provincial tax revenues (*fdtax*), on per capita public health expenditures. It is important to note that this variable only appears to have a negative short-run effect, whereas the lagged level effect is insignificant, despite being positive. Hence higher tax collections at the local level lead to a reduction in per capita health spending in the short run but there is no evidence for the long-run effects. In the case of the second measure of fiscal decentralisation i.e. provincial local revenues (*fdloc*), results are presented in Model 2. Despite producing comparing results for the other explanatory variables, the variable of interest i.e. *fdloc* could not achieve significance for either short-run or long-run effects. These results are not unexpected as the local revenues at the provincial level comprise of both the tax and non-tax revenues collected at the provincial level, and non-tax revenues can be considered as wind-fall gains/losses, hence unreliable. Therefore, local revenues could not capture the autonomy factor at a local level. Lastly, the third measure of fiscal decentralisation was federal transfers to provinces (*fdtrans*) and Model 3 reports its effects on per capita health expenditures. Once again, the fiscal decentralisation proxy has produced a negative effect on the dependent variable. Results suggest that as central governments in Pakistan started to transfer more resources to sub-national levels, it has negatively affected health spending. The short-run effects of *fdtrans* are insignificant while the implicit long-run effects, represented by the lagged level effects, have produced a highly significant negative coefficient of "-0.38".

Overall, fiscal decentralisation measures have a negative relationship with the dependent variable i.e. per capita public health expenditures. Results suggest that a greater level of fiscal decentralisation will have negative effects on the total consolidated health expenditures and shrinks in its overall volume. In the first instance, this is quite an unexpected result and reflects that an increased level of fiscal decentralisation will further reduce the already meager health resources. The situation reflects that SNGs in Pakistan are not spending as much as the federal government and there is a need to assess its ultimate effects on the provision of health facilities. Results potentially reflect two scenarios; one is that SNGs have a different focus and hence allocate resources to other social sector needs like water schemes, street paving, and lighting, which can become visible in a shorter period. On the contrary, this can be related to the positive outcome of fiscal decentralisation, which suggests that although SNGs might not have increased total health spending they could have reduced any misuse of funds. Besides, SNGs might have achieved better targeting and 'cure

[10] Obtained with the *Gets* approach

[11] Keeping the status for respective fiscal decentralisation measures as *F: fixed* in *PcGive*, so as to analyse their short run and long run effects

before the breakout' strategy (for significant epidemic diseases) which might have resulted in the efficient allocation of the scarce resources under a decentralised setup.[12] However, there is no empirical evidence for it at this stage and the following sections of this study, which assess the effects of fiscal decentralisation on health outputs and health outcomes, will possibly make the situation clear.

Table 3: Results for ECM Representation of Public Health Expenditure Model (Dependent Variable: Health Expenditures in 1st diff., Δ*hepc*)

Variables		Specific Model-1 for fd_{tax}	Specific Model-2 for fd_{loc}	Specific Model-3# for fd_{trans}
Constant	Cons	-15.17***	-8.48***	-9.49***
Health Expenditures	Δ*hepc*_1	0.37**	0.39**	0.19
GDP per capita	Δ*y*	1.32**	---	---
Population growth	Δ*pgr*	6.15***	4.77***	3.34***
	Δ*pgr*_1	-5.49***	-3.94***	-2.48**
Foreign Aid (UNICEF)	Δ*aid*_1	0.13*	0.16*	---
Health Expenditures	*hepc*_1	-0.67***	-0.69***	-0.66***
GDP per capita	*y*_1	1.73***	1.17***	1.35***
Population growth	*pgr*_1	1.37***	1.01***	0.59***
Foreign Aid (UNICEF)	*aid*_1	-0.25***	-0.25***	-0.03
Provincial tax revenues	Δfd_{tax}	-0.45**	---	---
	fd_{tax}_1	0.21	---	---
Provincial local revenues	Δfd_{loc}_1	---	0.17	---
	fd_{loc}_1	---	-0.12	---
Federal transfers to provinces	Δfd_{trans}	---	---	-0.21
	fd_{trans} _1	---	---	-0.38***
Trend	*t*	---	---	---
No. of observations		34	34	34
Number of parameters		12	11	11
PcGive Unit root test[13]		**-5.58*** **	**-4.92*** **	**-5.18*** **
AR 1-2 test		3.1739 [0.0635]	2.1106 [0.1461]	2.7692 [0.0856]
ARCH 1-1 test:		0.0691 [0.7943]	0.6230 [0.4357]	1.1618 [0.2891]
Normality test:		1.0978 [0.5776]	0.9153 [0.6328]	3.4957 [0.1741]
hetero test:		0.5718 [0.8726]	1.1130 [0.4315]	0.5345 [0.8945]
RESET test:		1.5234 [0.2422]	0.4363 [0.6522]	0.9405 [0.4063]

Note: ***, **, and * represent significance at 1%, 5%, and 10%, respectively; # Model 3 includes an outlier dummy for the year 1995; All variables were expressed in log form.

Having discussed the fiscal decentralisation measures, other control variables are by the existing literature. Results for the lagged level effects indicate that the improvement in economic progress (y) will have a positive impact on total health spending. This is according to expectation in developing countries like Pakistan, which need more resources to achieve a better quality of life. Similarly, to maintain/improve the existing health facilities, the government has to take into consideration the population growth. Results suggest that population growth is positively related to public health expenditures. This indicates effective planning on the part of the government because the increased level of the population has shown a positive effect on health expenditures. However, foreign aid will have a negative effect on public health spending in the long run. This is rather disappointing as governments seem to have substituted public funds with foreign funding instead of supplementing the existing resources (whenever these were available). Thus increase in foreign funding has a negative effect on public health expenditure, which is not a healthy trend.

[12] This response was noticed in Pakistan following floods and epidemic attacks such as Dengue fever

[13] The critical values and p-values used for the significance for the *PcGive* unit root test were obtained using the response surfaces in Ericsson and MacKinnon (1999) and Ericsson and MacKinnon (2002, p-316).

Within the given empirical setup, *lfp* failed to achieve significance and was dropped out of the analysis. Finally, it can be concluded that fiscal decentralisation will not lead to higher health spending in Pakistan, and discussion in the next sections will help us in correctly assessing the situation.

4.2 Results for Health Outcome Model

For the health outcome model, estimation results are once again divided into two parts. Firstly, the existence of a long-run relationship is investigated for the health outcome model, and upon the confirmation of the cointegration; the following sub-section elaborates the signs and significance of the variables.

4.2.a Evidence for the existence of LR relationship

The final analysis at the national level is for the health outcome model, where infant mortality rate (*imr*) was used to proxy health status in Pakistan. Before analysing the variable of interest i.e. fiscal decentralisation, the general model for *imr* was estimated (following Equation 2), to find out the long-run cointegrating relationship between the variables. Once an economical and improved ADL model was obtained, the proxies for fiscal decentralisation were analysed turn by turn, and the model was re-estimated in ECM representation (Equation 4). Final results for the infant mortality model including the fiscal decentralisation measures are presented next.

$$\begin{aligned}\Delta imr_t = \; & \nu + \delta t + \sum_{e=1}^{m} \beta_e \Delta imr_{t-e} + \sum_{f=1}^{n} \beta_f \Delta bedtp_{t-f} + \sum_{h=1}^{p} \beta_h \Delta hepc_{t-h} + \\ & \sum_{j=0}^{q} \beta_i \Delta aid_{t-i} + \sum_{k=0}^{r} \beta_k fenrl_{t-k} + \sum_{l=0}^{s} \beta_k \Delta fd_{it-k} + \gamma_1 imr_{t-1} + \gamma_2 bedtp_{t-1} + \\ & \gamma_3 hepc_{t-1} + \gamma_4 aid_{t-1} + \gamma_5 fenrl_{t-1} + \gamma_6 fd_{it-1} + \varepsilon_t \end{aligned} \quad (4)$$

Table 4 reports 'specific' ECM models for the three proxies of fiscal decentralisation. The fiscal decentralisation proxies indicate provincial autonomy [(i) provincial tax revenues and (ii) provincial local revenues)] and fiscal capacity (i.e. federal transfers). The given specific models validate the existence of a long-run relationship in the ECM representation as well. The error correction terms represented by lagged level dependent variable (*imr_1*) are highly significant in all the three ECM models and appear within the range of "-0.21 to -0.14". As the error correction terms are below "-1" thus exhibits the stability of the estimated model. However, with such low values for the error correction terms, the model shows a slow speed of adjustment, indicating that health interventions take a long time to take effect. Besides, all the diagnostic tests are satisfied, and we can rely on the results.

4.2.b Coefficient interpretation for the health outcome model

This section discusses the signs and significance of the explanatory variables in the health outcome model, once the cointegrating relationship is already confirmed. Table 4 shows that out of the three proxies of fiscal decentralisation, only fdtax has produced significant short-run effects in final specific Models 1. This indicates that if SNGs have more resources from the local resources, it will have significant short-run negative effects on *imr*. However, this setting does not yield any long-run effects, as the lagged level effects (*fdtax_1*) are insignificant. For the other two fiscal decentralisation measures, given empirical exercise could not suggest any significant results. Both the proxies for provincial local revenues (*fdloc*) and SNGs capacity (*fdtrans*) remained insignificant both for the short-run and long-run effects. Thus, it can be concluded that fiscal decentralisation has failed to bring the expected optimum outcome in the health sector, and hence, results are not very encouraging for Pakistan.

Analyzing the model, the overall fit is good. Given misspecification tests are satisfied for all the models and other explanatory variables have produced expected signs for the implicit long-run effects, represented by the lagged level effects. For all the three models, *bedtp* consistently retained negative signs, although it could not achieve significance in the ECM model, despite being significant in the ADL model. Another very important variable i.e. *hepc* retained statistically significant negative signs throughout and depicts that higher health spending results in improved health outcomes, as expected. Similarly, increased female

literacy also helps in reducing infant mortality and *fenrl* appears with the right sign. Lastly, the coefficient of foreign aid per capita is problematic as it remained positive throughout the analysis. This, on one side, points towards the rent-seeking behaviour on the part of the governments which seems to have replaced its public health spending with foreign aid. Generally, foreign aid is advanced to supplement governments' efforts but the coefficient here tells us that it was not the case. However, there is a chance that this positive sign might be indicating towards reverse causality. The possibility cannot be ruled out that foreign aid only pours in when the health indicators of the country are not very encouraging and this might be a cause of its positive sign. One possibility to cross-check this situation can be suggested as the use simultaneous equation model (SEM), however, we know SEM is not plausible in the limited data set like ours and it can lead to biased estimates in small samples. Therefore, this query is left for future research.

Table 4: Results for ECM Representation of Health Outcome Model (Dependent Variable- Infant mortality (per 1000 live births) in 1st *diff*, Δ*imr*)

Variables		Specific Model-1 for fd_{tax}	Specific Model-2 for fd_{loc}	Specific Model-3 for fd_{trans}
Constant	Cons	1.390***	1.246***	0.901***
Hospital Beds to population ratio	Δ*bedtp*_1	---	---	0.098**
Foreign Aid (UNICEF)	Δ*aid*	0.006**	0.007**	0.007**
	Δ*aid*_1	-0.006*	---	-0.007*
Female primary school enrolment	Δ*fenrl*_1	0.029**	0.040***	---
Infant mortality	*imr*_1	-0.215***	-0.191***	-0.145***
Hospital Beds to population ratio	*bedtp*_1	-0.015	-0.013	-0.044
Health Expenditures per capita	*hepc*_1	-0.005***	-0.005	-0.012***
Foreign Aid (UNICEF)	*aid*_1	0.019***	0.015***	0.018***
Female primary school enrolment	*fenrl*_1	-0.054***	-0.049***	-0.029**
Provincial tax revenues	Δfd_{tax}	-0.014**	---	---
	fd_{tax}_1	0.002	---	---
Provincial local revenues	Δfd_{loc}_1	---	0.003	---
	fd_{loc}_1	---	0.004	---
Federal transfers to provinces	Δfd_{trans} _1	---	---	0.002
	fd_{trans} _1	---	---	-0.003
No. of observations		34	34	34
Number of parameters		11	10	11
PcGive Unit root test		**-5.06*** **	**-4.36** **	**-3.76***
AR 1-2 test		0.0604 [0.9416]	0.1001 [0.9051]	0.6117 [0.5518]
ARCH 1-1 test:		0.0066 [0.9356]	0.0320 [0.8590]	0.0417 [0.8394]
Normality test:		4.8013 [0.0907]	0.8598 [0.6506]	5.8755 [0.0530]
hetero test:		1.0252 [0.4949]	0.5054 [0.9155]	1.3740 [0.2820]
RESET test:		1.9975 [0.1606]	2.4720 [0.1075]	0.4811 [0.6248]

Note: ***, **, and * represent significance at 1%, 5%, and 10%, respectively; *PcGive* Unit root test represents the Kiviet and Phillips (1992) test for cointegration; All variables were expressed in log form

5. CONCLUSION

Fiscal decentralisation brings efficiency gains; however, the success of decentralisation can be judged from the improvement in the quality of life. Access to better health and education opportunities plays a fundamental role in building societies, which ultimately translates into better economic results (because of

improved human capital). Although there are various matters which can be affected by decentralisation including governance, resource utilisation, poverty, budget deficits, and so on, but to assess whether or not local set up was considerate of public needs, we have to first look at its effects on basic needs of a better life, like health and education. If fiscal decentralisation has produced better results in these two crucial sectors, we can say that it is effective. Therefore, this study analysed fiscal decentralisation for its effects on the health sector.

Overall, in Pakistan, the health sector could not get the optimal attention from the policymakers. Despite the theoretical basis for improved service provision under a decentralized setup, we could not get the desired empirical support in the case of Pakistan. Data limitations, difficulty in separating foreign-funded projects, and other complexity, especially concerning the analysis in the case of Pakistan, leaves us with many unexplained questions. Yet, this study attempts to provide certain important indications in the case of Pakistan. The surprising fact relates to the negative effect of fiscal decentralisation in the case of health sector indicators in Pakistan. Pakistan is a country having less than 1% (of GDP) allocation to the health sector, therefore, such results are not unexpected. Still, fiscal decentralisation appearing with negative effects reflects the need for remedial measures.

Results made it clear that the health sector yet again is not in the basic focus even by SNGs. In both cases, with higher tax revenues and federal transfers to provinces, funds available to the health sector seem to have suffered. We can think of efficiency gains and capping any loopholes in the systems when funds are allocated through better informed local policymakers. Yet the negative effects of fiscal decentralisation on health spending raises concerns about the overall commitment of SNGs. Unfortunately, due to the inconclusive estimates on health facilities as represented by hospital beds and doctors' availability, it was not possible to confirm the earlier mentioned argument.

Lastly, although there are some positive effects in the case of health outcomes as shown, however, these are neither too strong, due to potential econometric issues. To sum up, this study provides a basis for analysis relating fiscal decentralisation with the health sector. There is certainly support for fiscal decentralisation as provincial fiscal autonomy had a negative and significant short-run impact on health outcomes, however, the policymakers need to seriously reconsider the situation and consider the inclusion of efficiency-enhancing indicators in the resource distribution mechanism in Pakistan.

Acknowledgment
We are thankful to the reviewers of the paper for the valuable comments which helped us to improve its quality.

Funding Source:
The author(s) received no specific funding for this work.

Conflict of Interests:
The authors have declared that no competing interests exist.

REFERENCES

Abbas, F., & Hiemenz, U. (2011). Determinants of public health expenditures in Pakistan. *ZEF-Discussion Papers on Development Policy*, Bonn (158).

Ahmad, I. (2020), Fiscal decentralisation and economic growth. *Pakistan Journal of Applied Economics*, 30(1), 95-121.

Ahmad, I. (2016). Assessing the effects of fiscal decentralisation on education sector; A cross-country analysis. *The Lahore Journal of Economics*, 21(2), 53–96.

Ahmad, I., Arif, M. Z. & Khalid, M. (2016). From fiscal decentralization to economic growth: The role of complementary institutions. *The Pakistan Development Review*, 55(4), 761–780

Davoodi, H., & Zou, H. (1998). Fiscal decentralization and economic growth: A cross-country study. *Journal of Urban Economics*, 43(2), 244-257.

Di Matteo, L. (2005). The macro determinants of health expenditure in the United States and Canada: assessing the impact of income, age distribution and time. *Health Policy*, 71(1), 23-42.

Di Matteo, L., & Di Matteo, R. (1998). Evidence on the determinants of Canadian provincial government health expenditures: 1965–1991. *Journal of Health Economics*, 17(2), 211-228.

Doornik, J. A. (2009). Autometrics, Chapter 4. In: Castle, J. L. and Shephard, N. eds. *The Methodology and Practice of Econometrics: A Festschrift in Honour of David F. Hendry*. Oxford University Press, 88-121.

Ericsson, N. R., & MacKinnon, J. G. (2002). Distributions of error correction tests for cointegration. *The Econometrics Journal*, 5(2), 285-318.

Ericsson, N. R., & MacKinnon, J. G. (1999). Distributions of error correction tests for cointegration. *International Finance Discussion Paper no. 655*, Board of Governors of the Federal Reserve System, Washington, D.C.

Freeman, D. G. (2003). Is health care a necessity or a luxury? Pooled estimates of income elasticity from US state-level data. *Applied Economics*, 35(5), 495-502.

GoP (various issues). *Economic Survey of Pakistan*. Islamabad: Finance Division, Economic Adviser's Wing, Government of Pakistan.

GoP (2009). *Pakistan Statistical Yearbook*. Islamabad: Statistics Division, Federal Bureau of Statistics.

Hatfield, J. W., & Kosec, K. (2013). Federal competition and economic growth. *Journal of Public Economics* 97, 144–159.

Hendry, D. F., & Krolzig, H. (2003). New developments in automatic general-to-specific modeling. In: Stigum, B. P. ed. *Econometrics and the Philosophy of Economics, Pp. 379–419.* Princeton University Press.

Hendry, D. F., & Krolzig, H. (2005). The properties of automatic GETS modelling. *The Economic Journal*, 115(502)

Hoover, K. D., & Perez, S. J. (1999). Data mining reconsidered: encompassing and the general-to-specific approach to specification search. *The Econometrics Journal*, 2(2), 167-191.

Jiménez, D. & Smith, P. C. (2005). Decentralisation of health care and its impact on health outcomes. *Discussion Papers in Economics, Department of Economics and Related Studies*, York University, 10 (Department of Economics and Related Studies, York University).

Jiménez-Rubio, D. (2011, a). The impact of fiscal decentralization on infant mortality rates: evidence from OECD countries. *Social Science & Medicine*, 73(9), 1401-1407.

Jiménez-Rubio, D. (2011, b). The impact of decentralization of health services on health outcomes: evidence from Canada. *Applied Economics*, 43(26), 3907-3917.

Khaleghian, P. (2004). Decentralization and public services: the case of immunization. *Social Science & Medicine*, 59(1), 163-183.

Khan, M.J., Nadeem, A., Ahmad, I., & Arif, M. Z. (2019). Decentralization, institutions and economic growth: Further investigation. *City University Research Journal*, 9(4), 788-798.

Kiviet, J. F., & Phillips, G. D. (1992). Exact similar tests for unit roots and cointegration. *Oxford Bulletin of Economics and Statistics*, 54(3), 349-367.

Krolzig, H., & Hendry, D. F. (2001). Computer automation of general-to-specific model selection procedures. *Journal of Economic Dynamics and Control*, 25(6), 831-866.

Martinez-Vazquez, J. (2001). Intergovernmental fiscal relations and the assignment of expenditure responsibilities. *Atlanta, GA: Andrew Young School of Policy Studies*, Georgia State University.

Oates, W. (1972). *Fiscal Federalism*. New York: Harcourt, Brace, Jovanovich.

Oates, W. E. (1999). An essay on fiscal federalism. *Journal of Economic Literature*, 37(3), 1120-1149.

Robalino, D. A., Picazo, O. F., & Voetberg, A. (2001). Does fiscal decentralization improve health outcomes? Evidence from a cross-country analysis. *Policy Research Working Paper 2565, World Bank*, Washington DC.

State Bank of Pakistan (SBP) (2005, 2010). *Handbook of Statistics on Pakistan Economy*. Karachi: State Bank of Pakistan.

Siddiqui, R., Afridi, U., & Haq, R. (1995). Determinants of expenditure on health in Pakistan. *The Pakistan Development Review*, 34(4), 959-970.

Thornton, J. (2007). Fiscal decentralization and economic growth reconsidered. *Journal of Urban Economics*, 61(1), 64-70.

Toor, I. A., & Butt, M. S. (2005). Determinants of health care expenditure in Pakistan. *Pakistan Economic and Social Review*, 43(1), 133-150.

Uchimura, H., & Jütting, J. P. (2009). Fiscal decentralization, Chinese style: good for health outcomes? *World Development*, 37(12), 1926-1934.

Vo, D. H. (2010). The economics of fiscal decentralization. *Journal of Economic Surveys*, 24(4), 657-679.

Weingast, B. R. (2014). Second generation fiscal federalism: political aspects of decentralization and economic development, World Development 53, 14–25.

Woller, G., & Pillips, K. (1998). Fiscal decentralization and LDC economic growth: an empirical investigation. *Journal of Development Studies*, 34, 139-148.

Xie, D., Zou, H., & Davoodi, H. (1999). Fiscal decentralization and economic growth in the United States. *Journal of Urban Economics*, 45(2), 228-239.

Zhang, T., & Zou, H. (1998). Fiscal decentralization, public spending, and economic growth in China. *Journal of Public Economics*, 67(2), 221-240.

Kashmir Economic Review, Volume 29, Issue 2, December 2020

Kashmir Economic Review
ISSN(P): 1011-081X, ISSN(E): 2706-9516
http://www.ker.org.pk

Money Demand Function in Ghana: Does Stock Prices Matter?

ABSTRACT

This study aims to investigate the impact of stock prices on money demand in Ghana. Quarterly data is utilized between 1999Q:1 and 2017Q:4, where the broad monetary aggregate (M2) is the dependent variable and the independent variables included real income, short-term interest rate, real effective exchange rate, and real stock prices. The study employed Autoregressive Distributed Lag (ARDL) and bounds cointegration techniques. The bounds test outcome indicated the existence of a long-run equilibrium relationship between M2, real income, short-term interest rate, real effective exchange rate, and real stock prices. The results show that real income and real stock prices affect real M2 demand positively and significantly in both the short-run and long-run. Hence, the wealth effect is dominant for the Ghanaian economy. Further, the study recorded a negative influence of short-term interest rate and real effective exchange rate on M2 demand but only the former affects M2 demand significantly in the short-run and long-run. The important policy implication derived from the results is that, if the Bank of Ghana can prevent downturns and volatility of the stock market, a sound monetary targeting could be achieved.

.

AUTHORS

Mutawakil Abdul-Rahman
Ph.D. Scholar, Economics Department, Ibn Haldun University, Istanbul, Turkey
Author's Contributions: 1, 2, 3, 4, 5, 6
mutawakil.rahman@ibnhaldun.edu.tr
https://orcid.org/0000-0002-7340-3551

Rasim Ozcan
Professor, Dean of Graduate School, Economics Department, Ibn Haldun University, Istanbul, Turkey
Author's Contributions: 2, 4, 6
rasim.ozcan@ihu.edu.tr
https://orcid.org/0000-0002-5738-7563

Asad ul Islam Khan*
Assistant Professor, Economics Department, Ibn Haldun University, Istanbul, Turkey
Author's Contributions: 2, 4, 6
asad.khan@ihu.edu.tr
https://orcid.org/0000-0002-5131-577X

Keywords
ARDL, Ghana, Money demand, Stock prices

JEL Classification
E41, G10, N27, N17

Please cite this article as:
Abdul-Rahman, M., Ozcan, R., & Khan, A.I. (2020). Money demand function in Ghana: Does stock prices matter?, *Kashmir Economic Review*, 29(2), 45-61.

*** Correspondence author**

Author's contribution in the article: 1- Conceived and designed the analysis, 2- Reviewed and compiled the literature, 3- Collected the data, 4- Contributed data or analysis tools, 5- Performed the analysis, 6- Wrote the paper, 7- Financial support for the conduct of the study, 8-Other

1. INTRODUCTION

Knowing the right argument for the money demand function will ensure a stable function of money demand which could be useful for the successful initiation of monetary policy, as it will give guidance in selecting the right policy instruments and targets. However, a money demand function that has been stable could become unstable with changes in economic conditions. As such, financial development, financial reforms and innovations, and greater financial integration have been related to several financial and economic crises. Such financial innovations might impact monetary transmission processes and significantly change the determinants of monetary aggregate (Alsamara & Mrabet, 2019). Besides, internet trading together with development and inventions in the mutual fund industry led to the reduction of cost of transactions and thus might increase the substitutability between equities and money (Carpenter & Lange, 2003). That is, ease in internet trading coupled with innovations and development of financial markets and general happenings in an economy might have increased the role of the stock market in economic development as well as its role in monetary policy formulation.

In Ghana, the stock market has transformed into a significant medium for storing wealth in recent years. It has become a platform where secondary securities such as bonds, shares, and other public sector debt securities, which are subjected to varying maturity periods are traded by the citizens-the public, private, and institutions to mobilize financial resources for saving and investment purposes by either with initial public offer or improvement on the pre-existing capital base. In that sense, stock markets can be said to improve the culture of saving, which is an essential indicator as far as economic development is concerned. Nevertheless, the stock markets set the basis for households and firms to diversify their portfolios for both financial and non-financial assets which are held as a store of wealth (Mwanzia *et al*., 2015).

However, in a highly volatile stock market like the Ghanaian stock market, the optimization of wealth portfolios depends crucially on the interest rates, given that the stock markets issue a variety of competing for financial and non-financial assets which are subjected to varying risk returns. Due to the high volatility and high-risk premia, portfolio adjustment might occur in favor of safer assets which might include real money balances. In this case, the happenings in the stock market can significantly affect the conduct of monetary policy via affecting real money demand. In a developing country like Ghana where the holding of cash balances is prominent in the portfolio of firms and households, money targeting forms the basis of the monetary policy regime. Therefore, money targeting fails if the impact of the stock market is not taken into consideration. In a nutshell, stock market development can lead to the substitution of money balances in favor of or against stocks which in turn may cause non-tenability of the growth rates of money supply targeted to achieve the desired macroeconomic objectives (Mwanzia *et al*., 2015).

From Friedman (1988) paper, money demand and stock price linkage can be positive or negative. The positive link of stock prices with money demand indicates a wealth effect while the negative effect indicates a substitution effect. Friedman (1988) proposed three reasons that may account for the wealth effect. Firstly, relatively well-doing stock markets mean a rise in nominal incomes, and therefore extra cash will be needed for daily operations. Secondly, in a well-doing stock market, the expected returns for risky assets may increase about safe assets. If this happens, there might be a substitution of assets with money which may be seen as a safe asset. Thirdly, an increase in stock prices may raise the transaction volume of the financial market, hence participants will need more cash in hand to carry out operations. On the other hand, the substitution effect asserts that as stock markets perform well, equity returns become attractive compared to other financial market components such as money, as an asset, hence a shift from money to shares.

To this end, the Ghanaian money demand equation has been widely examined, however, none of the previous authors has incorporated the real stock prices into the equation to test Friedman's argument (Nkalu, 2020; Ahiawodzi, 2013; Abasimi & Khan, 2019; Tweneboah & Alagidede, 2018; Ange-Patrick & Hervé, 2017; Nchor & Adamec, 2016; Baidoo & Yusif, 2019; Asiedu *et al*. 2020; among others). To cover this gap, this study is set up to find out which effect (wealth or substitution effect) dominates the Ghanaian

economy. This objective is achieved by using the Auto-regressive Distributed Lag (ARDL) model proposed by Pesaran *et al*. (2001) and the bounds cointegration test to explore the short and long-run effects of the real stock prices on the Ghanaian money demand function. Nonetheless, understanding the direction of the impact of the stock market on money demand could help the policymaker to improve the success of money targeting-based monetary policy initiations in the Ghanaian economy.

The remainder of the article is organized as follows. Section 2 explains the money demand model and the significance of the determinants added to the model. Section 3 summarizes the previous relevant literature. Section 4 describes the data and the econometric model used for the analysis. Section 5 presents the estimation results and interpretations. Finally, section 6 gives conclusions and policy recommendations.

2. THE MONEY DEMAND MODEL

Despite Taylor's rule disregarding the role of money demand in monetary policy, its role is still recognized by scholars in the successful conduct of monetary policy. About the theory of money demand, to model the money demand function one must include a scale variable that represents the transaction volume in an economy, and an opportunity cost variable as the main independent variables. In addition to the scale variable and the opportunity cost determinants of money demand, following Friedman (1988), Choudhry (1996), and Baharumshah *et al*. (2009) the money demand function can be specified by including stock prices as given below:

$$(M/P)^d = f(y, ir, ex, sp) \tag{1}$$

where, $(M/P)^d$ is the real money demand with M being nominal demand for money and P is the price level, y is real income, which has been proven to be the most significant determinant of money demand in the literature. ir denotes the short-term nominal interest rate, ex is the exchange rate and sp is the real stock price[1]. Theory shows that nominal demand for money has a direct relation with the price level P, hence the ratio of the former to the latter gives the real money demand. The scale variable which is y indicates transaction volume and wealth in an economy. Friedman (1959) stressed the importance of returns on alternative assets to the money demand function. Heller (1965) also argued for a short-term interest rate as being more important to the money demand function than the long-term interest rate. Hence, the short-term interest rate is included to represent the opportunity cost of holding money. The ex variable denotes variations in the local currency with foreign currency (ex). It is argued that to see the impact of variations in the value of the domestic currency on the money demand function in the free market economy, a variable representing the relative return of the foreign currency to the domestic currency, such as the exchange rate, international interest rate or interest rate differential, must be added in the demand function of money (Bahmani-Oskooee, 2001; Chowdhury, 1997; Civcir, 2003; Khalid, 1999). Stock prices (sp), according to Friedman (1988) might have wealth or a substitution effect on money demand. The semi-log linear form of Equation (1) can be written as:

$$l(m-p)_t = \beta_0 + \beta_1 ly_t + \beta_2 ir_t + \beta_3 lex_t + \beta_4 lsp_t + e_t \tag{2}$$

where l signifies the natural logarithm symbol, e_t is the assumed white noise error process, β_0 is the intercept, $\beta_1, \beta_2, \beta_3$, and β_4 indicate how much real money demand responds to the explanatory variables. Theoretically, the estimate of the β_1 *to* β_4 parameters should be as; $\beta_1 > 0$, $\beta_2 < 0$, $\beta_3 < 0$ if substitution effect exists, or $\beta_3 > 0$ if wealth effect exists, β_4 will be positive if sp has a wealth effect on money demand, or negative on the other hand if sp has a substitution effect on the money demand function. For the coefficient of real income, β_1 is expected to be positive. If $\beta_1 = 1$ the theory of quantity money demand is

[1] Since stock prices measures wealth effects it should be in real terms rather than nominal values (Friedman, 1988)

applicable; if $\beta_1 = 0.5$, the inventory theory of Baumol–Tobin could be applied; and if $\beta_1 > 1$ money is regarded as a luxury which means that the wealth effect of real income is neglected (Baharumshah *et al*., 2009; Ball, 2001).

3. LITERATURE REVIEW

The literature review was conducted in two parts. The first part tried to review all related studies which have previously analyzed the Ghanaian money demand function. The second part of the literature review was aimed at reviewing all relevant studies on stock prices' relationship with money demand in both advanced and emerging economies. The literature survey is organized as follows.

3.1. Part I

Previous researchers employed various econometric techniques to analyze the Ghanaian money demand function. Nkalu (2020) employ the Pedroni Residual Cointegration Test and Panel Two-Stage Estimated Generalized Least Squares with instrumental variables to study money demand equations for Ghana and Nigeria within the range of 1970 and 2014. The obtained results show proof of liquidity preference theory, in which the included variables–official exchange rates, real interest rates, and inflation were significant economically except real income. Ahiawodzi (2013) analyze the impact of interest rate on money holdings in the Ghanaian economy with the Ordinary Least Squares (OLS) and Engel and Granger two-step technique. The study utilized annual data and explored the mentioned relationship which covered the period from 1970 to 2010. Based on the OLS results the authors concluded that the broad money demand (M2+) is responsive to the interest rate both in the short and long run, and stable as well.

Similarly, Abasimi and Khan (2019) study the money demand function by comparing estimation outcomes from OLS and ARDL approaches using annual data between 1983 to2013. The obtained evidence shows that real GDP, exchange rate, and inflation have robust and significant short-run and long-run impacts on demand for money. By considering the outcome of the several breakpoint tests, the study concludes that money demand was stable. Ghartey (1998) explores the relations of exchange rate risk, exchange rate, real income, and prices with nominal money stock, with the application of OLS and Johansen's full information maximum-likelihood method to time series ranging from 1970:4 to 1992:4. The results show a cointegration relationship exists in the variables, and that the short-run deviations are adjusted slowly to long-run equilibrium by 6%. Further, the obtained evidence shows demand function for money and the estimated parameters are significant and stable. Apart from the OLS approach, other methods are also employed in analyzing the money demand function.

The ARDL for example is another widely used technique for investigating the nexus between money demand and its determinants. Baidoo and Yusif (2019) attempt to analyze the effect of the interest rate on demand money in the Ghanaian economy by using the ARDL and bounds cointegration techniques. Yearly data of broad monetary aggregate (M2+), 91-day treasury bill rate, income, inflation, and exchange rate were used for the analysis from 1980 to 2016. The authors obtained evidence that the interest rate does not have a significant impact on the demand for M2+ in Ghana. Further, income (inflation rate) was found to have a significantly positive (negative) effect on the money demand function.

Similarly, Tweneboah and Alagidede (2018) applied the ARDL unrestricted error correction technique and the bounds cointegration test to test the presence of currency substitution in Ghana, using annual data from 1960 to 2013. The results reveal that the income elasticity for M1 is close to one but less than unity for M2. The findings further show that the home interest rate is affecting M1 and M2 negatively and positively, respectively. The study findings also show a negative and positive impact of returns on foreign bonds and exchange rate, respectively, on M1 and M2 money. Hence, the authors concluded that currency substitution does not exist. Also, Ange-Patrick and Hervé (2017) used annual data from Ghana and Cote d'Ivoire and

conducted a comparative analysis of demand for money, over the range of 1980-2015, with the ARDL and bounds cointegration procedures where exchange rate, output, interest rate, and inflation were included as regressors. For Ghana, the reported results show that output, inflation, and interest are long-run significant indicators of M2 money demand within the period. However, insignificant coefficients were reported for the short-run dynamics, and the demand for money function was shown to be stable.

Moreover, Dagher and Kovanen (2011) re-estimated the demand for cash for Ghana in a period where the economy underwent a series of reforms by employing the ARDL and the bounds cointegration test from 1990:Q1 to 2009:Q4. The broad money demand M2+ was regressed on real income, exchange rate, and interest rate. The exchange rate and real income derive M2+ demand in Ghana, and the demand for money within that period was also stable. Iyke and Ho (2017) also used quarterly data from the period 1990:Q1 to 2016:Q3, with the ARDL framework to test the Friedman hypothesis for the Ghanaian economy. The study investigated monetary uncertainty relations with money demand by differentiating between short-run and long-run impacts. The results indicate that positive increases in monetary uncertainty reduce money holdings in both runs, thereby refuting Friedman's hypothesis. The study also showed that within the examined period money demand is constant.

Asiedu *et al*. (2020) used both the ARDL and vector error correction model (VECM) to study the Ghanaian money demand function and the outcome reveals money demand function is stable if real income, exchange rate, inflation, domestic interest rate, and foreign interest rate are used as its arguments. Thus, there exists a short and long-run relationship between money demand and its determinants.

Besides OLS and ARDL techniques, the Johansen cointegration and the ECM are also employed by some authors to study money demand and its determinants for Ghana. Nchor and Adamec (2016) analyze the long-run stability and linkage of income and interest rate with real money demand (M1 and M2+) from 1990 to 2014 by using the VECM. The findings show a long-run effect of real income and a short-run effect interest rate on demand for money. The findings also show M1 and M2+ demand are stable with real income and interest rate as explanatory variables and based on the Chow test no structural breaks exist within the period.

A similar technique was used by Havi *et al*. (2014) to investigate the Ghanaian money demand function using M2 as the dependent and real GDP, 91-day treasury bill rate, nominal exchange rate, expected inflation, and international interest rate. The findings show a stable cointegration relationship between the regressors and M2 money demand. The reported results further show for the long run, expected inflation and nominal international interest rate are important indicators of demand for money, while for the short run, nominal exchange rate and real income are seen to be important determinants of M2 holdings in the Ghanaian economy. Also, in 21 African countries including Ghana, Bahmani-oskooee (2009) used the error correction model and bounds cointegration test to investigate money demand constancy between 1971 and 2004 with quarterly data. The findings reported for Ghana show real income, inflation, and exchange rate significantly affect the demand for real money, and evidence for stability was also reported over the considered period.

Besides, in the 1980s when some significant macroeconomic adjustments occurred in the Ghanaian economy which included privatization, removal of foreign exchange controls, and so on, Andoh and Chappell (2002) tested the destabilization of demand for money function by including real per capita consumption and inflation into the function, and broad M2 monetary aggregate was the dependent variable. They reported evidence indicating that between 1960 and 1996 there exists a systematic break in the Ghanaian money demand function which occurred in 1983. Finally, Kallon (1992) tested the appropriateness of the neoclassical money demand theory using real M1 monetary aggregate for the economy of Ghana. The study used quarterly data which covered the period between 1966 and 1986. The reported results indicate that in the Ghanaian economy people view interest-earning financial assets as

attractive alternatives to real money balances, although the relationship is weak. The obtained evidence also shows that Ghanaians adjust their short-term cash holdings in real terms and their real Ml holdings in nominal terms.

3.2. Part II

The effect of equity returns on money demand has been analyzed by researchers for both industrialized and emerging countries. For a developed country like the US, Friedman (1988) addressed the influence stock prices have on money demand function. The results showed positive effects of lagged values of equity returns and negative contemporary effects on holdings of money. In Friedman (1988) view, the lagged equity returns have a wealth effect on the real quantity of money, whereas the substitution effect exists contemporaneously. Thornton (1998) for Germany, used the Johansen cointegration technique for his research, and to explain the dynamics of demand for money in the short run the error correction form of the data was also considered. The findings show that an increase in real returns of stocks has affected the long-run M1 holdings for the period of 1960-1989. By using data from Italy, Caruso (2006) demonstrates that stock prices which include dividends have a positive influence on the demand for function between 1913-1980, indicating the wealth effect of stock returns on money demand in Italy. The study shows that the wealth effect only prevails and is stable in the short run-thus stock market only explains the temporary movement of money demand. Jung and Villanova (2020) show that stock prices are positively related to M3 money demand in the Euro area.

Also, some authors argue that the inclusion of stock prices into the money demand function may improve stability. In an effort made by Carstensen (2006) to answer the question if the behavior of money demand underwent a structural change at the end of 2001, following the considerable overshooting of M3 money growth reference value set by the European Central Bank. The evidence provided indicates that the long-run money demand function for European Monetary Union has increased considerably in terms of stability when stock returns and stock market volatility were included in the function. Thus, specifying the money demand function without stock prices at the right-hand side renders it unstable. Carpenter and Lange (2003) also for the US find evidence that inserting stock prices into the money demand function reduces errors, that is, it improves stability and affects cash holdings significantly. Carpenter and Lange (2003) also conduct out-of-sample forecasting and the findings indicate that forecasting can also be improved by including stock price variables. The money demand and stock price relations are quite similar in developing countries too, a mixed evidence has been reported.

In developing countries, the empirical evidence shows both the wealth and substitution effect of equity returns on money demand. Tule *et al*. (2018) use the ARDL bounds testing procedure to scrutinize the function of money demand for Nigeria by including stock prices as an independent variable. The obtained evidence shows the existence of a long-run relationship between GDP, stock prices, foreign interest rate, and real exchange rate. Further, the results show returns on the stock have a significant increasing effect on broad M2 holdings in the long-term. To understand how stock prices affect the Indian money demand function within the period of 1996:1 to 2010:8. Kumari and Mahakud (2012) use the VECM and the Juselius cointegration approach to obtain evidence that money demand is responsive to stock prices. Further, they conduct Granger causality tests, and the obtained results show that stock prices unidirectionally cause money demand.

McCornac (1991) conducted a study on how stock prices influence money demand for the Japanese economy—a replication of Friedman (1988) study. The findings present evidence of real stock returns' positive impact on money demand and risk-spreading effect on money demand. Mwanzia *et al*. (2015) explore the impact stock prices might display on money demand in the Kenyan economy by using cointegration and the VECM. The findings show that the stock market of Kenya positively and significantly affects money holdings in the economy. Al Rasasi *et al*. (2020) use Johansen cointegration test and the VECM to investigate the potential effect of stock prices on demand for money in Saudi Arabia. The results

reveal that an increase in stock prices causes an increase in cash holdings significantly, hence the existence of the wealth effect. Omar and Hussein (2020) scrutinize the impact of stock prices on the equation of money demand in South Africa. They reported that, though there is a significant positive long-run impact on money demand, the equation is however unstable.

Contrary to the pre-mentioned studies, for emerging countries, other researchers find an inverse relationship of stock prices with the demand for money function. Baharumshah (2004) finds a negative significant substitution effect of stock prices on short-run and long-run broad money holdings for Malaysia and thus, stock prices Granger cause broad money demand. Baharumshah *et al*. (2009) for China, employ the cointegration method and find a significant substitute effect of stock prices on money demand. Akinlo and Emmanuel (2017) demonstrate that stock prices have a substitution effect on the Nigerian money demand function and can lead to misspecification if omitted from the function. Nevertheless, in the study aimed at exploring the relationship between equity returns and money demand in Poland, Hsing (2007) concluded that stock prices do not influence the function of money demand.

The previous literature indicates the Ghanaian money demand function is determined by real income, interest rate, exchange rate, and inflation. Most of the previous authors found these indicators to have significant impacts on the money demand function in Ghana. In addition to those determinants, Havi *et al*. (2014) and Tweneboah and Alagidede (2018) added foreign interest rate as an explanatory variable, and they found that international interest rate is another important indicator of money demand in Ghana. Finally, Iyke and Ho (2020) also added monetary uncertainty as independent variables in their study and they reported a significant response of money demand to monetary uncertainty. The current study will extend stock prices money demand nexus to the Ghanaian economy as it is lacking in the Ghanaian literature. This study aims to investigate the long run and short run nexus between real money demand and stock prices which could be useful for money targeting-based monetary policy formulation.

4. DATA AND ECONOMETRIC METHOD

4.1. Data

The study utilizes quarterly data ranging from 1999:Q1 to 2017:Q4. The lower limit of the study span is decided by data accessibility for the M2 monetary aggregate which is the dependent variable, and the upper limit is determined by considering the closure of seven financial institutions in early 2018, which were part of listed firms in Ghana Stock Exchange (GSE) index. Extending the sample beyond 2018 may yield unreliable results. The independent variables include real stock prices (SP) which is the target variable, real gross domestic product (GDP) for real income, short-term interest rate (TBR), and real effective exchange rate (RER). Real money balances and Real stock prices (SP) were calculated as the ratio of the nominal values to the consumer price index (CPI)—a proxy for general price levels. The short-term interest rate which is the opportunity cost variable is represented by the 91-day treasury bill rate. The real income variable (GDP) is measured in Ghanaian cedis with 2010 fixed prices which were collected from World Development Indicators (WDI). The CPI and real effective exchange rate data were collected from the International Monetary Fund (IMF) International Financial Statistics (IFS) database. Data for M2 monetary aggregate and 91-day treasury bill rate (TBR) were extracted from the Bank of Ghana (BoG) time-series database. Finally, the SP data series is the average quarterly data and was extracted from the GSE market reports.

The graphical representations of all the series are presented in Figure A (Appendix A). Also, the nominal SP data series is plotted in Figure B (Appendix A). In Figure B, it can be seen that there is a sharp drop corresponding to the beginning of 2011 (2011:Q1) which marks the era where the GSE index was transformed from the All Share Index (ASI) to Composite Index (CI). Therefore, to capture the effect of the structural break a dummy variable (D0) is incorporated into the model. It can also be seen from Fig. B.

a continued decline of the GSE index —approximately corresponding to the commencement of 2018— when seven listed financial institutions in the Ghanaian stock exchange market were closed down. Therefore, to avoid misleading regression results, the study span is limited to the range between 1999:Q1 and 2017:Q4.

4.2. Econometric Model

The ARDL method and the bounds test are employed to study the long-run and short-run relationships of real income, interest rate, real effective exchange rate, and real stock prices with real monetary aggregate (M2). The ARDL method is seen as appropriate for examining the money demand equation in the previous literature because it yields robust results in non-stationary time-series data, or when the stationarity test results show the mixture of I(0) and I(1) series. This is because the ARDL approach takes its basis from the assumption that variables are $I(0)$ and $I(1)$, and also interpretation is quite straightforward because it involves a single equation. The long-run money demand model is:

$$LM_t = b_0 + b_1 LGDP_t + b_2 TBR_t + b_3 LRER_t + b_4 LSP_t + \varepsilon_t \qquad (3)$$

where L is the symbol of the natural logarithm, M_t is real money demand, GDP is real gross domestic product representing real income, TBR is the 91-day treasury bill rate, RER denotes real effective exchange rate, SP is real stock prices, $b_1, b_2, b_3 and\ b_4$ are long-run money demand elasticities corresponding to real income, interest rate, real exchange rate, and stock prices, respectively. ε_t is the error term. b_0 is the intercept. The expected signs of the elasticities are discussed in section 2. Based on the aim of this study, introducing short-run and long-run dynamics into equation (3) yields ARDL representation of equation 3 as follows:

$$\Delta LM_t = a_{01} + \sum_{i=1}^{p} a_1 \Delta LM_{t-i} + \sum_{i=1}^{q_1} a_2 \Delta LGDP_{t-i} + \sum_{i=1}^{q_2} a_3 \Delta TBR_{t-i} + \sum_{i=1}^{q_3} a_4 \Delta LRER_{t-i} + \sum_{i=1}^{q_4} a_5 \Delta SP_{t-i} + b_1 LM_{t-1} + b_2 LGDP_{t-1} + b_3 TBR_{t-1} + b_4 LRER_{t-1} + b_5 LSP_{t-1} + \varepsilon_t \qquad (4)$$

where α_{01} is the intercept term; b_1, b_2, b_3, b_4 and b_5 are long-run elasticities; α_1, α_2, α_3, α_4 and α_5 are the short-run elasticities; Δ is the difference operator. The bounds test is employed to test the null hypothesis, H_0; $b_1 = b_2 = b_3 = b_4 = b_5 = 0$, which means no long-run relationship, and it is tested against the alternative H_1; $b_1 \neq b_2 \neq b_3 \neq b_4 \neq b_5 \neq 0$, which indicates a cointegration relationship prevails among the series. In this case, the decision is guided by the Wald test-based F-statistic for cointegration test—where the F-statistic value is compared with a set of $I(0)$ and $I(1)$ table values (Pesaran *et al*., 2001). The H_0 cannot be rejected if the calculated F-statistics value is lower than $I(0)$ bound critical value, therefore, the outcome will be no long-run associations among the series. On the other hand, if the computed F-statistic exceeds the upper set $[I(1)]$ critical value, H_0 will be rejected, indicating a long-run relationship. However, the decision is inconclusive if the calculated value falls between $I(0)$ and $I(1)$ bounds table values.

Replacing $b_1 LM_{t-1} + b_2 LGDP_{t-1} + b_3 TBR_{t-1} + b_4 LRER_{t-1} + b_5 LSP_{t-1}$ in equation Equation (4) with φect_{t-1} gives the error correction specification in an ARDL setting, as in Equation (5). If cointegration exists Eq. (6) will be estimated.

$$\Delta LM_t = \alpha_{02} + \sum_{i=1}^{p} \alpha_1 \Delta LM_{t-i} + \sum_{i=1}^{q_1} \alpha_2 \Delta LGDP_{t-i} + \sum_{i=1}^{q_2} \alpha_3 \Delta TBR_{t-i} + \sum_{i=1}^{q_3} \alpha_4 \Delta LRER_{t-i} + \sum_{i=1}^{q_4} \alpha_5 LSP_{t-i} + \varphi ect_{t-1} + \varepsilon_t \qquad (5)$$

where ε_t is the disturbance term which is white-noise. φ is the error correction term (ect_{t-1}) coefficient, it is the component that measures the rate of correction of deviations in the long run, and it should bear a negative sign and must be less than 1 to ensure convergence.

5. RESULTS AND INTERPRETATIONS

5.1. Descriptive statistics and correlation properties of time series

The descriptive statistics are reported in Table 1. It is shown in the table that the degree of asymmetry of data observations which is measured by the skewness value is positive (long right-tailed) for all the variables except LM2. In the concept of skewness, a zero (0) value indicates symmetry. Therefore, we can conclude from the table that, to the nearest whole number, all the variables but interest rate exhibit symmetry. The peakedness or flatness of a distribution is measured by the kurtosis value. In concept, a mesokurtic distribution should have a kurtosis value of three (3). In that sense, to the nearest whole number, the LRER and TBR are mesokurtic and the rest are platykurtic. The Jarque-Bera statistics and the associated probability values indicate only the LRER has a normal distribution considering a 5% level of significance.

Table 1: Descriptive statistics

Variable	LM2	TBR	LGDP	LRER	LSP
Mean	4.3094	20.6737	25.2159	4.5018	3.4161
Median	4.2946	20.2700	25.1737	4.5438	3.5772
Max.	5.5186	46.6800	25.8504	5.0405	5.0203
Min.	3.0000	9.3900	24.6363	4.0564	2.0516
Std. Dev.	0.8174	8.8369	0.3812	0.1996	0.9853
Skewness	-0.1521	0.8846	0.0543	0.1357	0.0464
Kurtosis	1.6417	3.4429	1.5927	3.1488	1.5022
Jarque-Bera	6.7810	11.6410	6.9726	0.3354	7.8817
Prob.	0.0337	0.0030	0.0306	0.8456	0.0194

Note: The probability values are associated with Jaque-Bera statistics which follows a Chi-square distribution with 2 degrees of freedom.

Table 2 reports the correlation coefficients among the time series. The dependent variable (LM2) is positively correlated with LGDP and LSP, whilst negatively correlated with TBR and LRER. The LGDP and LSP have the highest correlation coefficient (-52.5%), and the lowest correlation coefficient (-2.1%) is displayed by TBR and LGDP. A high correlation between independent variables can lead to multicollinearity which can inflate the coefficient of determination and cause the estimate of parameters to be highly significant. The correlation coefficients among the independent variables show the possibility of encountering multicollinearity problems is minimal.

Table 2: Correlation coefficients between the time series

Time Series	LM2	LGDP	TBR	LRER	LSP
LM2	1.0000	0.0734	-0.2255	-0.0140	0.0984
LGDP	0.0734	1.0000	-0.0206	0.0273	-0.5252
TBR	-0.2255	-0.0206	1.0000	-0.4511	-0.0122
LRER	-0.0140	0.0273	-0.4511	1.0000	0.0254
LSP	0.0984	-0.5252	-0.0122	0.0254	1.0000

5.2. Unit Root Test

Non-stationarity is a common feature of time series data. So to know the stationarity properties of the series, the Augmented Dicke-Fuller (ADF) (Dickey & Fuller, 1979) and Phillip-Perron (PP) (Phillip & Perron, 1988) traditional unit root tests are used to conduct a unit root test, and they are complemented with the Ziot-Andrews (ZA) (Zivot & Andrews, 1992) structural break unit root test. This is deemed necessary because the traditional unit root might spuriously reject or accept a unit root null hypothesis if there is a structural break in the data. In Table 3, the results of the traditional unit root tests are presented. It is seen

that both the ADF and the PP tests could not reject the unit root null hypothesis at levels for all the time series, hence, LM2, LGDP, TBR, LRER, and LSP are integrated of order one [I(1)].

Table 3: ADF and PP unit root tests results

Time Series	ADF at levels		ADF at first difference		Conclusion
	Constant	Linear Time Trend	Constant	Linear Time Trend	
$LM2$	-0.7366	-1.7453	-9.8278***	-9.8101***	I(1)
$LGDP$	0.7970	-1.9146	-8.0756***	-8.1035***	I(1)
TBR	-2.3404	-2.6843	-6.4893***	-6.4484***	I(1)
$LRER$	-2.2986	-2.5906	-6.6460***	-6.6799***	I(1)
LSP	-0.7338	-1.7460	-8.1069***	-8.1133***	I(1)
	PP at levels		PP at first difference		
$LM2$	-0.8008	-1.5903	-9.8552***	-9.8492***	I(1)
$LGDP$	0.6653	-2.0749	-8.1356***	-8.1618***	I(1)
TBR	-2.0958	-2.3499	-6.5082***	-6.4676***	I(1)
$LRER$	-2.3685	-2.9159	-6.6526***	-6.6774***	I(1)
LSP	-0.9394	-1.9739	-8.1325***	-8.1385***	I(1)

Note: '*','**' and '***' indicate the rejection of the null hypothesis of unit root at 10%, 5%, and 1% significance level, respectively.

The results of the ZA unit root test are tabulated in Table 4. It can be seen that with the model with only intercept the ZA test outcomes are the same as the traditional stationarity tests for LM2, LGDP, and TBR, given a 5% level of significance. Thus, the ZA test confirms that these variables are I(1). The remainder of the variables (LSP and LRER) seem to be an order zero [I(0)] according to the ZA test results. This indicates that, the existence of either a spike or a slut which the conventional tests could not capture led to the spurious acceptance of the unit root null hypothesis for LSP and LRER by ADF and PP tests.

Based on the obtained results from the stationary tests, the series are an amalgamation of I(0) and I(1). This shows that applying OLS will yield spurious estimates of the parameters. Therefore, we resort to the ARDL framework to carry out the analysis.

Table 4: ZA unit root test results

Time Series	ZA at levels		ZA at first difference		Conclusion
	Constant	Linear Time Trend	Constant	Linear Time Trend	
$LM2$	3.7691	-5.7049***	-5.0589**	-4.9225*	I(1)
$LGDP$	-4.6513	-5.2777**	-9.7068***	-9.7737***	I(1)
TBR	-4.5681	-4.7005	-6.5814***		I(1)
$LRER$	-5.0910**	-5.3284**	-6.9259***		I(0)
LSP	-5.5130***	-5.1704**			I(0)

Note: '*','**' and '***' indicate the rejection of null hypothesis of unit root at 10%, 5% and 1% significance level, respectively

5.3. Bounds cointegration test.

A robust bounds cointegration test outcome in an ARDL setting can be achieved if an appropriate lag length is determined because ARDL modeling is sensitive to the lag length. The Schwarz criterion (SIC) is used to select the lag length because it is argued that a SIC-based ARDL turns to give reliable results in relatively small samples. A maximum of six lags are imposed manually and the SIC determined the appropriate optimal lag length. An ARDL (1, 0, 0, 0, 0) model is determined by SIC, which means one lag order for the LM2, and zero lag order for each of the rest (LGDP, TBR, LRER, and LSP). The structural break stationary test results show a break in the SP data series, so a dummy variable (D0) is incorporated into the model as

a fixed regressor, where it takes a value of one for 2010 and 2011 and zero for other years. Estimating equation 4 with lag order (1, 0, 0, 0, 0), the H_0 the hypothesis is tested against the H_1 as the alternative hypothesis by using the bounds test. Table 5 contains the outcome of the bounds test. As seen in the table, the calculated F-statistics is slightly above the upper bound table critical value, hence the null hypothesis is rejected. Therefore, the real monetary aggregate (LM2) is associated with the LGDP, TBR, LRER, and LSP in the long run. Based on the bounds test outcome, the study proceeds and obtains the long-run coefficients.

Table 5: Bounds cointegration test results

Dependent Variable: LM2	F-statistics (F_{PSS})	Bounds critical value		Outcome
Sample (1999:Q1-2017:Q4)		I(0)	I(1)	
$LM2 = f(LGDP, TBR, LRER, LSP)$ k=4	4.18	2.86	4.01	Cointegration

Note: I(0) and I(1) are F bounds critical values at a 5% significance level computed by Pesaran et al. (2001) for Case III-unrestricted constant and no trend.

5.4. Long run Estimation Results

The outcome of the estimated parameters for the long run and diagnostic tests are tabulated in Table 6. From the table, the real income variable (LGDP) is positively related to real money demand. We expected this outcome theoretically, an increase in real income of citizens should lead to an increase in real money demand according to the money demand theory. The estimate of LGDP is statistically significant at a 1% level. A percentage increase in real income results in a 2.21% increase in demand for real money in the Ghanaian economy. In the previous literature, authors including Dagher and Kovanen (2011), Nchor and Adamec (2016), Tweneboah and Alagidede (2018), Abasimi and Khan (2019), Baidoo and Yusif (2019), and Asiedu *et al*. (2020) found a similarly significant positive impact of real income on broad M2 demand for the Ghanaian economy.

Table 6: ARDL Long-run Estimates (Dependent variable: LM2)

Variable	$Coefficients$	$Standard\ Error$	t-statistics	$P\ values$
Constant	-20.1634	5.3237	-3.7875	0.0003
$LGDP_t$	2.2123	0.0879	25.1695	0.0000
TBR_t	-0.0055	0.0022	-2.4614	0.0164
$LRER_t$	-0.0412	0.1239	-0.3322	0.7408
LSP_t	0.0595	0.0205	2.9047	0.0050
Diagnostics and stability tests				
Test	F-statistic (Prob)		Regression statistics	
Serial correlation LM test	5.4082 (0.2479)		$R^2 = 0.9974$	
Heteroscedasticity test	19.3200 (0.7347)		Adjusted R^2 =0.9972	
Normality test	6.2296 (0.0441)		Durbin Watson stat=1.968	
CUSUM	stable		F-statistics=4376.972	
CUSUMSQ	stable		Prob= 0.000	
EC = LM2 - (2.2123*LGDP -0.0055*TBR -0.0412*LRER + 0.0595*LSP)				

The most important independent variable in this study is the log of the stock price (LSP), which according to the results in Table 6, has a significant positive influence on the broad M2 demand, at a 1% significant level in the long run. Theoretically, the positive wealth impact of stock prices on money demand is expected. The wealth effect implies that an increase in stock market volume in Ghana will serve as an incentive to hold more cash to either trade in the stocks, or because nominal incomes of citizens might have increased, and citizens will demand more cash to run daily transactions. Also, the positive impact could be accounted for by the fact that, given the risky and volatile nature of developing stock markets like the Ghanaian own, if expected returns on risky asset increases as compare to safe assets, there might be a switch from financial assets to money balances, as it might be deemed as a safe asset. The finding shares some similarities with

extant findings including Tule *et al*. (2018), Kumari and Mahakud (2012), Mwanzia *et al*. (2015), Al Rasasi *et al*. (2020), and Omar and Hussein (2020) who have also reported a positive influence of stock price on demand for money in emerging countries. The results however contradict the findings of Baharumshah (2004), Baharumshah *et al*. (2009), Akinlo and Emmanuel (2017), who reported a negative relationship between the former and the latter.

The short-term interest rate (TBR) which was defined by the 91-day treasury bill rate, and the real effective exchange rate (LRER) have a long-run negative impact on the broad money demand. Theoretically, for both variables, we expected a negative impact. For the TBR, if returns on alternative assets such as government bonds and other financial security increases, holdings of money will decrease in turn. However, only the interest rate affects broad M2 demand significantly at a 5% level. Authors such as Nkalu (2020), Ange-Patrick and Hervé (2017), Nchor and Adamec (2016), and Havi *et al*. (2014) report a similar significant negative impact of interest rate on money demand in Ghana which supports our results. However, it is in disagreement with Tweneboah and Alagidede (2018), who reported a positive but insignificant impact of TBR on money demand.

Some diagnostic and stability tests were carried out on the estimated model. Breusch-Godfrey serial correlation LM test, White heteroskedasticity test, and Jaque-Bera normality test were conducted. The model seemed to pass LM and White tests but failed the Jaque-Bera test at a 5% level of significance, hence the residuals from the regression do not have a normal distribution.

5.5. The Unrestricted Error Correction Model

Because cointegration exists between broad M2 and the determinants understudy, the unrestricted error correction specification as in Eq. 5 is estimated, and the short-run and the ect_t estimates are tabulated in Table 7. From the table, it can be seen that all the variables bear the expected signs. Real income and stock price variables have a positive sign and are statistically significant at 5% and 10% level, respectively. The short-run significant estimate of real income is in line with previous findings including Abasimi and Khan (2019), Havi *et al*. (2014), and Bahmani-Oskooee (2009) for the Ghanaian economy. On the other hand, interest rate and real effective exchange rate bear negative signs, and only the interest rate affects money holdings significantly at a 10% level.

Table 7. Unrestricted error correction form for ARDL(1, 0, 0, 0, 0) model (Dependent variable: ΔLM2)

Variable	*Coefficients*	*Standard Error*	*t-statistics*	*P values*
Constant	0.0137	0.0093	1.4657	0.1474
$\Delta LM2_{t-1}$	0.0130	0.1275	0.1022	0.9189
$\Delta LGDP_t$	1.1809	0.5296	2.2299	0.0291
ΔTBR_t	-0.0030	0.0017	-1.7628	0.0825
$\Delta LRER_t$	-0.0799	0.0961	-0.8311	0.4089
ΔLSP_t	0.0412	0.0223	1.8457	0.0694
ect_{t-1}	-0.3855	0.1200	-3.2121	0.0020
Diagnostics and stability tests				
Test	F-statistic (Prob)		Regression statistics	
Serial correlation LM test	1.2159 (0.2702)		$R^2 = 0.2365$	
Heteroscedasticity test	28.4867 (0.3862)		Adjusted R^2 =0.1681	
Normality test	4.1035(0.1285)		Durbin Watson stat=2.0270	
CUSUM	stable		F-statistics=3.4582	
CUSUMSQ	stable		Prob= 0.0049	

The estimate of the error correction term is negative and statistically significant at a 1% level. The negative sign indicates the correction of errors in the long-run which might have been caused by short-run deviations. The estimate of ect_t the term shows the errors in the system are moderately adjusted by 39% in the long run. The unrestricted error correction model passed the LM serial correlation test, White heteroskedasticity test, and normality tests.

5.6. Stability Test

The cumulative sums (CUSUM) and cumulative sum of square (CUSUMSQ) stability tests are incorporated into the estimated unrestricted model in Table 7. Accordingly, this is necessary because destabilization might occur due to unsuitable short-run dynamics modeling which characterizes long-run deviations (Bahmani-Oskooee, 2001; Laidler, 1993; Sharifi-Renani, 2008). These tests were invented by Brown *et al*. (1975) and they are used to determine the constancy of parameters in an estimated regression model. The graphical plots of the stability tests as in Figures 1 and 2 show the stability of the parameters within the 5% significance boundary. Hence, both tests confirm the stability of the estimated M2 money demand equation for the considered period.

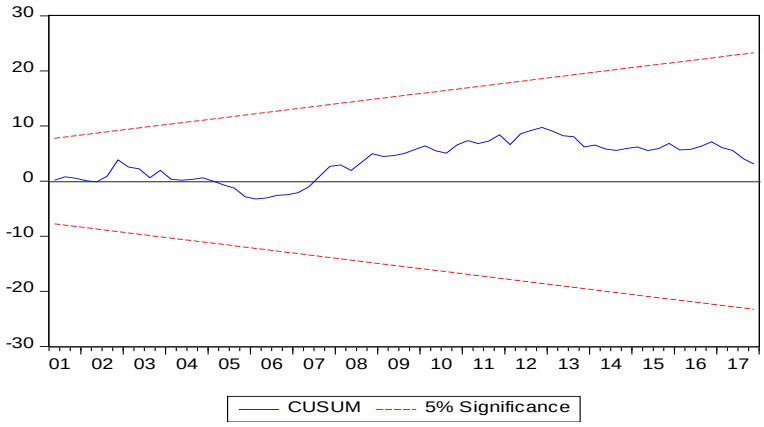

Figure 1: CUSUM test graph

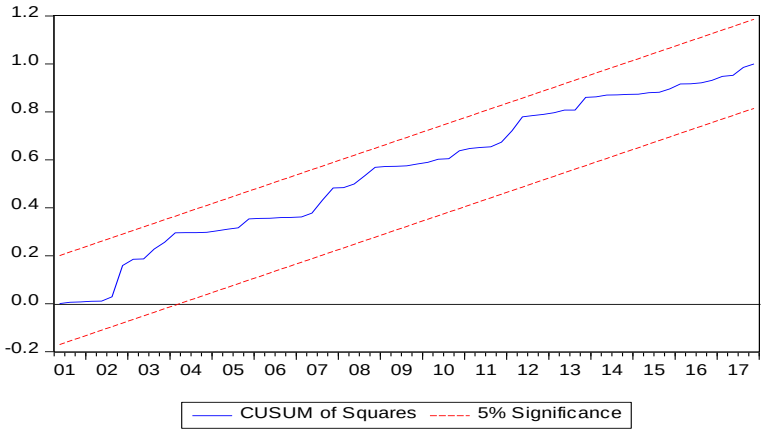

Figure 2: CUSUMSQ test graph

6. CONCLUSION

Friedman (1988) proposed and tested empirically the impact of stock returns on money demand for the US. Several other researchers did the same by using sampled data from different countries, both advanced and

emerging countries, and mostly obtained significant relationships between stock prices and money demand. This study aimed to replicate the previous studies by using data from Ghana to explore which effect (wealth or substitution) dominates the Ghanaian economy. The ARDL modeling and the bounds cointegration test were used to investigate the impact of stock prices on broad M2 demand, and covered the period between 1999:Q1 and 2017:Q4. The results show stock prices do matter for the Ghanaian money demand function, and thus the wealth effect dominates. Hence, the inclusion of real stock prices is necessary for the analyzed period.

The bounds test result shows a cointegration relation between broad M2 demand and real income, short-term interest rest, real effective exchange rate, and real stock prices. The results indicate that real income and real stock prices have a significant positive impact on broad M2 demand in both the short-run and long-run. The positive effect of stock prices indicates the wealth effect, meaning that the value function of the monetary aggregate is expressed by a positive relation, and the level of share prices predominantly forms a major proxy of financial capital. Further, the estimation results show that the short-term interest rate and real effective exchange rate have negative effects on broad M2 demand, but only the estimate of the short-term interest is statistically significant in both the short-run and long run. The CUSUM and CUSUMSQ tests indicate the stability of money demand with the regressors.

Providing evidence that stock price is a significant determinant for the broad M2 demand in Ghana can offer useful policy recommendations. This means that the BoG can initiate feasible monetary targeting if it can control the GSE index. For accurate money targeting, the BoG should initiate policies that will prevent downturns and volatility of the stock market. Also, by putting measures in place to stabilize the short-term interest rate BoG can control the demand for broad M2, then feasible money targeting can be achieved. Future researchers can use more sophisticated econometric techniques such as nonlinear ARDL or techniques that can account for structural breaks to get a clearer picture of the impact of stock prices on demand for real money balances in Ghana.

Acknowledgment:
We are thankful to the anonymous reviewers of the paper for the valuable comments which helped us to improve its quality.

Funding Source:
The author(s) received no specific funding for this work.

Conflict of Interests:
The authors have declared that no competing interests exist.

REFERENCES

Abasimi, I., Li, X., & Khan, M. I. (2019). Estimating the transitional dynamics of money demand in Ghana. *American Based Research Journal*, *10*, 39–52.

Ahiawodzi, A. K. (2013). Interest rate elasticity of demand for money in Ghana. *International Research Journal of Finance and Economics*, *108*, 115–131.

Akinlo, A. E. & Emmanuel, M. (2017). Stock prices and demand for money: Evidence from Nigeria. *Review of Business & Finance Studies*, *8*(1), 1-19.

Al Rasasi, M., Rawa, F., & Alghamdi, B. (2020). On the nexus between stock market fluctuations and the demand for money in Saudi Arabia. *Business and Economic Research*, *10*(1), 142-154.

Alsamara, M. & Mrabet, Z. (2019). Asymmetric impacts of foreign exchange rate on the demand for money in Turkey: new evidence from nonlinear ARDL. *International Economics and Economic Policy*, *16*(2), 335–356.

Andoh, S. K. & Chappell, D. (2002). Stability of the money demand function : Evidence from Ghana.

Applied Economics Letters, 9, 875-878.
Ange-patrick, Y. K. & Hervé, D. B. G. (2017). Comparative analysis of the stability of money demand between Côte d ' Ivoire and Ghana: *An Application of ARDL Model*. *9*(11), 163–172.
Asiedu, M., Nazirou, S. C. M., & Sabrina, S. J. (2020). Long-run money demand in Ghana: In search of stability. *Journal of Financial Risk Management*, *09*(04), 418–433.
Baharumshah, A. Z., Mohd, S. H., & Yol, M. A. (2009). Stock prices and demand for money in China: New evidence. *Journal of International Financial Markets, Institutions and Money*, *19*(1), 171–187.
Baharumshah, A. Z. (2004). Stock prices and long-run demand for money: Evidence from Malaysia. *International Economic Journal*, *18*(3), 389–407.
Bahmani-oskooee, M. (2009). How stable is the demand for money in African countries ? *Journal of Economic Studies. 36*(3), 216–235.
Bahmani-Oskooee, M. (2001). How stable is M2 money demand function in Japan?. *Japan and the World Economy*, *13*(4), 455–461.
Baidoo, S. T. & Yusif, H. (2019). Does interest rate influence demand for money ? An empirical evidence from Ghana. *Economics Literature*, 1, 24–36.
Ball, L. (2001). Another look at long-run money demand. *Journal of Monetary Economics*, *47*(1), 31–44.
Brown, R. L., Durbin J. & Evans J. M. (1975). The techniques for testing the constancy of regression relations over time. *Journal of Royal Statistical Society*, 37, 149-192.
Carpenter, S.B., & Lange, J. (2003). Money Demand and Equity Markets. (Federal Reserve Board. Finance and Economics Discussion Series, No.3)
Carstensen, K. (2006). Stock market downswing and the stability of European monetary union money demand. *Journal of Business and Economic Statistics*, *24*(4), 395–402.
Caruso, M. (2006). Stock market fluctuations and money demand in Italy, 1913-2003. *Economic Notes*, *35*(1), 1–47.
Civcir, I. (2003). Money demand, financial liberalization and currency substitution in Turkey. *Journal of Economic Studies*, *30*(5–6), 514–534.
Choudhry, T. (1996). Real stock prices and the long-run money demand function: Evidence from Canada and the USA. *Journal of International Money and Finance*, *15(*1), 1–17.
Chowdhury, A. R. (1997). The financial structure and the demand for money in Thailand. *Applied Economics*, *29*(3), 401–409.
Dagher, J., & Kovanen, A. (2011). On the Stability of Money Demand in Ghana : A Bounds Testing Approach. IMF Working Paper, No. 273.
Dickey, D. A., & Fuller, W. A. (1979). Distribution of the estimators for autoregressive time series with a unit root. *Journal of American Statistical Association*, 79, 427–431.
Friedman, M. (1959). Post War Trends in Monetary Theory: Policy and Institutions. John Wiley and Sons, New York.
Friedman, M. (1988). Money and the Stock Market. *Journal of Political Economy*, *96*(2), 221–245.
Ghartey, E. E. (1998). Monetary dynamics in Ghana: Evidence from cointegration, error correction modelling, and exogeneity. *Journal of Development Economics*, *57*(2), 473–486.
Havi, E. D. K., Enu, P., & Opoku, C. D. K. (2014). Demand for money and long run stability in ghana : Cointegration approach. *European Scientific Journal*, *10*(13), 483–497.
Heller, H.R (1965). The demand for money: The evidence from the short run data. *Quarterly Journal of Economics*, 79(May), 297.
Hsing, Y. (2007). Impacts of financial stock prices and exchange rates on the demand for money in Poland. South East European Journal of Economics and Business, *2*(1), 7–13.
Iyke, B. N., & Ho, S. (2017). Monetary uncertainty and the demand for money in Ghana. *The Journal of Developing Areas*, *51*(4), 1–13.
Jung, A., & Carcel Villanova, H. (2020). The empirical properties of euro area M3, 1980-2017. *Quarterly Review of Economics and Finance*, *77*, 37–49.
Kallon, K. M. (1992). An econometric analysis of money demand in Ghana. *The Journal of Developing*

Areas, *26*(4), 475–488.
Khalid, A. M. (1999). Modeling money demand in open economies: The case of selected Asian countries. *Applied Economics*, *31*(9), 1129–1135.
Kumari, J., & Mahakud, J. (2012). Relationship between stock prices, exchange rate and the demand for money in India. *Economics, Management, and Financial Markets*, *7*(3), 31–52.
Laidler, E. W. D (1993). *The Demand for Money: Theories, Evidence and Problems*, 4th edition, Harper Collins College Publishers, London.
McCornac, D. (1991). Money and the level of stock market prices: Evidence from Japan. *Quarterly Journal of Business and Economics*, *30*(4), 42–54.
Mwanzia, J., K., Ndanshau, M., O., A., & Luvanda, E. (2015). The effect of stock prices on demand for money: The case of Kenya. *Tanzanian Economic Review*, *5*(1-2), 1–21.
Nchor, D., & Adamec, V. (2016). Investigating the stability of money demand in Ghana. *Procedia - Social and Behavioral Sciences*, *220*(March), 288–293.
Nkalu, C. N. (2020). Empirical analysis of demand for real money balances in Africa : Panel evidence from Nigeria and Ghana. *African and Asian Studies*, 1–14.
Omar, F. A., & Hussein, A. M. (2020). the Stability of money demand function: Evidence from South Africa. *International Journal of Economics and Financial Issues*, *10*(5), 16–22.
Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of Applied Econometrics*, *16*(3), 289–326.
Phillip, P. C. B., & Perron, P. (1988). Testing for a unit root in time series regression. *Biometrika*, *75* (2), 335–346.
Sharifi-Renani, H. (2008). Demand for money in Iran: An ARDL approach. *MPRA*, *39922*, 0–29.
Thornton, J. (1998). Real stock prices and the long-run demand for money in Germany. *Applied Financial Economics*, *8*(5), 513–517.
Tule, M. K., Okpanachi, U.M., Ogiji Patricks, & Usman, N. (2018). A reassessment of money demand in Nigeria. *CBN Journal of Applied Statistics*, *9*(1), 47-75.
Tweneboah, G., & Alagidede, P. (2018). Currency substitution and stability of money demand in Ghana. *The Journal of Developing Areas*, *52*(2), 41–53.
Zivot, E., & Andrews, D. W. K. (1992). Further evidence on the great crash, the oil-price shock, and the unit-root hypothesis. *Journal of Business and Economic Statistics*, 20(1), 25–44.

Appendix A:

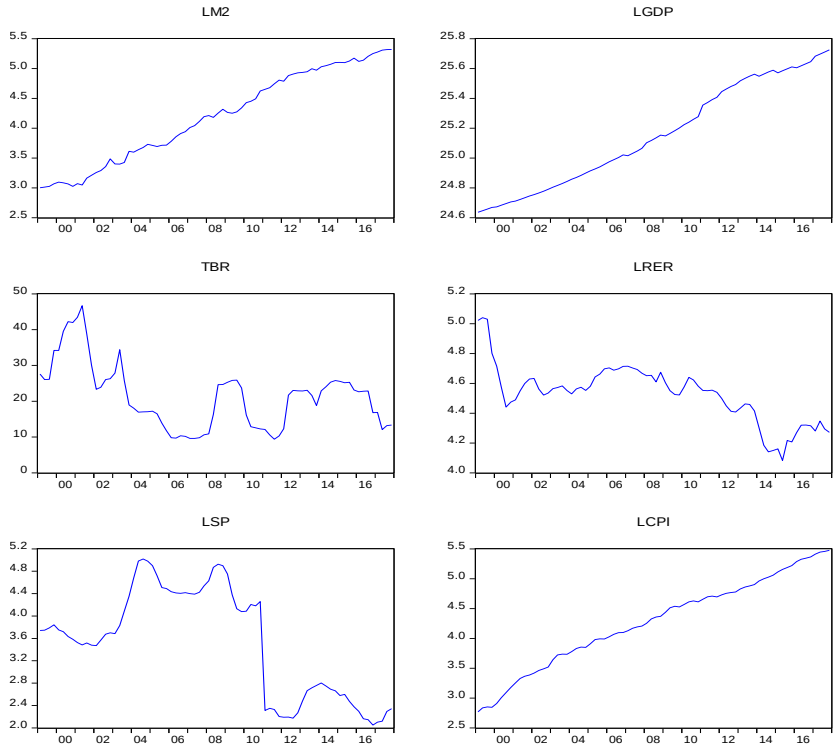

Figure A: The graphical representation of the time-series data used for the analysis

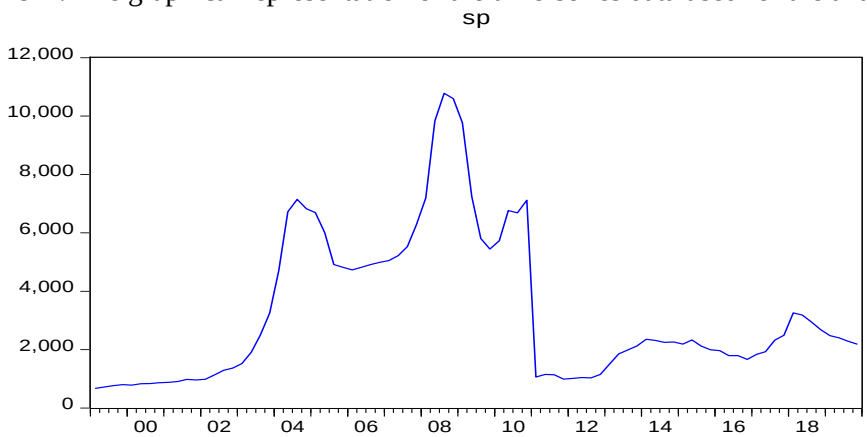

Figure B: The plot of quarterly nominal GSE index (SP) from 1999:Q1-2019:Q4

M2: It constitutes the narrow money (M1) plus quasi money. The BoG also announces the M2+ which constitutes M2 plus foreign currency deposit. M2 is used for the analysis because of inconsistency in the time series data for M2+.

GDP: The data for this variable was not quarterly available, so the yearly data series was converted to quarterly series by using Eviews software.

SP: There are two components to the stock price data set. To replace the previous All-Share index, the GSE launched the Composite index in 2011. This suggests that there were two indices for the GSE within the sample set at different times; the GSE All-Share index covering the period 1999:Q1 to 2010:Q4, and the GSE Composite index covering the period 2011:Q1 to 2017:Q4. Since the GSE Composite index was adopted, the method of measuring the closing prices of shares is different from that used under the GSE All-Share index regime.

Kashmir Economic Review, Volume 29, Issue 2, December 2020

Kashmir Economic Review
ISSN(P): 1011-081X, ISSN(E): 2706-9516
http://www.ker.org.pk

Regional integration and services exports: A comparative analysis of growth, performance, and competitive advantage for ECO region

ABSTRACT

This study intends to perform the comparative analysis of growth, performance, and competitive advantage of services exports of Pakistan regarding ECO (Economic Cooperation Organization) countries. There hardly exists any such study. To examine the growth and performance of services exports in ECO countries this study relies on descriptive statistics while the competitive advantage of Pakistan regarding other ECO countries is analyzed using well recognized Balassa index. Results of the study show that although the share of ECO in world services exports is comparatively small than other regional trading blocs however, it is consistently on the rise. And Balassa's index shows that Pakistan has managed to maintain and develop exports of royalties and license fees services and computer and information services over the years. To exploit its RCA (Revealed Comparative Advantage) in computer and information services, this study suggests Pakistan should spend on the education and training of its youth to enhance its human capital.

AUTHORS

Khadim Hussain*
Assistant Professor, Mirpur University of Science and Technology (MUST), Mirpur
Author's Contributions: 1, 2, 4, 5, 6, 8
hussain,eco@must.edu.pk
https://orcid.org/0000-0002-1415-4647

Uzma Bashir
M.Phil. Scholar, Mirpur University of Science and Technology (MUST), Mirpur
Author's Contributions: 1, 2, 3, 4, 6
uzmabashir380@gmail.com

Muhammad Saim Hashmi
Assistant Professor, Mirpur University of Science and Technology (MUST), Mirpur
Author's Contributions: 2, 3, 8
saim.eco@must.edu.pk

Muhammad Ajmair
Assistant Professor, Mirpur University of Science and Technology (MUST), Mirpur
Author's Contributions: 2, 8
ajmair@must.edu.pk

Keywords
Trade, Services Export, ECO, Revealed Comparative Advantage (RCA), Exports Performance

JEL Classification
F10, F14, F15, F19

Please cite this article as:
Hussain, K., Bashir, U., Hashmi, M. S. & Ajmair, M. (2020). Regional integration and services exports: A comparative analysis of growth, performance, and competitive advantage for ECO region, *Kashmir Economic Review*, 29(2), 62-74.

*** Correspondence author**

Author's contribution in the article: 1- Conceived and designed the analysis, 2- Reviewed and compiled the literature, 3- Collected the data, 4- Contributed data or analysis tools, 5- Performed the analysis, 6- Wrote the paper, 7- Financial support for the conduct of the study, 8-Other

1. INTRODUCTION

The service sector has become the most important of three sectors for most of the economies of the world and that is why it is now often touted as the engine of economic growth, especially for developing countries (Park and Shin, 2012). The importance of services in international trade and investment is rising rapidly (WTO, 2014). Services that were previously considered non-tradeable are now traded frequently (McGuire, 2002). Although, trade in services is only 25% of total global trade its growth is higher (6%) than the trade in goods (2%) (WTO, 2014). Further, services export is higher in developing countries than in developed countries (UNCTAD, 2014). The chief cause of growth in services trade is the revolution of technological advancement and improvements in telecommunication infrastructure (Banga and Kumar, 2010). The service sector not only directly affects economic growth positively but also crucially helps the industrial sector to grow by providing them essential services like financial services, transport, communication, wholesaling, and other business services (Ahmed *et al*. 2017).

Erstwhile, services trade was thought to be invisible and so it was not included in the first round of negotiations of the General Agreement on Trade and Tariffs (GATT) in 1947. In the mid-1980s, however, services gained enough attention that they got included in WTO's Uruguay Round of negotiations. According to General Agreement on Trade in Services (GATS) services sector is comprised of twelve core services: transportation services, communication services, financial services, business services, construction, and related engineering services, distribution services, educational services, environmental services, health-related services, tourism and travel services, recreational, cultural and sporting services and other miscellaneous services. This shows that along with traditional services some non-traditional services have also been included in this classification.

Services trade is different from goods trade primarily because services carry the proximity burden. It means that being 'flow', services can't be stored therefore they require proximity of buyer and seller. According to GATS, there are four modes of service supply. The first is, cross border supply. In this mode, services are provided across the border without the movement of either seller or buyer. The second mode is the movement of the buyer to the country of the supplier. The third mode is, establishing a legal person (offshore affiliate) in the country of the buyer. And the fourth mode is the movement of the seller to the buyer's country. Due to the development in communication technologies, this proximity burden has been a weekend (Saez and Goswami, 2010).

Pakistan is one of the emerging players in the services trade in the world. It has an important presence in trading blocs like SAARC (South Asian Association for Regional Cooperation) and ECO (Economic Cooperation Organization). ECO was originally established as Regional Cooperation for Development (RCD) in 1964 by Iran, Pakistan, and Turkey. It was an intergovernmental organization for the sake of socio-economic development. It was renamed as Economic Cooperation Organization (ECO) in 1985. ECO also included prospects like technical and cultural co-operation besides economic co-operation among its member states. In 1992 ECO included seven new states: the Islamic Republic of Afghanistan, Republic of Azerbaijan, Republic of Kazakhstan, Kyrgyz Republic, Republic of Tajikistan, Republic of Uzbekistan, and Turkmenistan. Although over time ECO developed its international stature yet it faces challenges mainly due to lacking appropriate infrastructure and institutions. ECO priorities are the energy sector, drugs control, trade, transportation, and agricultural sector.

Many similarities of ECO countries like culture, traditions, and customs are helpful for them to manage and expand trade in the services sector along with the manufacturing sector. The introduction of WTO and GATS is further helpful in this regard. ECO countries are rich in natural resources and human capital is in abundance in these countries. These countries are different in the quality of human resources as well as their comparative approach towards economic wellbeing and growth. This difference in the resource quality

leads them over one another to get higher growth and ultimately comparative advantage in their trade relations. There is a need to focus on this area to analyze their comparative regional position. In this purview, this study focused on growth, performance and revealed the comparative advantage of services exports of Pakistan regarding ECO countries. This is an important contributing aspect of the study in current literature. It is hard to find any comparative study which is focusing services trade in ECO countries. So this study was meant to fill the void. Although, the present study has focused on ECO countries the findings of the study may be helpful for the developing countries as a whole because most of them are now transforming their economies into service-based economies.

2. REVIEW OF LITERATURE

There is a plethora of literature available on the trade of goods or on trade in the aggregate which implicitly incorporates services in it. But studying services in isolation is relatively a recent phenomenon. The available literature on services trades mainly concerned with three dimensions. Firstly, studies tried to find out the determinants of services trade. Secondly, studies tried to find out the nexus between services trade and economic growth. And finally, studies focused impact of trade policies on services trade and economic growth. These are briefly being reviewed as under.

As in the case of trade in goods, studies focusing on determinants of trade in services also broadly seem to suggest that, it is a comparative cost that primarily determines the potential of a country's export. These studies include Ok *et al*. (2014), Copeland and Mattoo (2008), and Deardorff (1985). And these comparative costs depend on factors endowment and availability of relevant technology (Vernon, 1966; Krugman, 1986). Kaur (2016) used revealed comparative advantage methodology to study services trade in South Asian Association for Regional Cooperation (SAARC) countries. She found that India produced and exported modern services and gained a comparative advantage because of the availability of required technology, skilled labor, and English speaking capability of workers. Marel (2011) worked in twenty-three OECD countries. This study also showed that trade in services is sensitive to factor endowment like availability of high skilled and mid-skilled labor and information technology-related capital stock. Other important determinants of services trade were found to be domestic regulations, market size, trade agreements, and exchange rate (Shingal, 2010; Lennon *et al*., 2008; Kimura and Lee, 2006).

The second strand of literature which focused on services trade and economic growth nexus seems to agree with the positive relationship between them. Bosworth and Collins (2008), found that service exports played important role in the economic growth of many countries. Studies that specifically focused on developing countries also concluded that services trade has played a vital part in the growth of these economies. Examples of these studies are Langhammer (2002) and Teltscher (2002). Another such study was conducted by Mitra (2013). It was found that the Philippine's exports of services are the principal engine for growth for the period 1998-2012. The study suggested expanding the scale and scope of exports and to expand tourism across the country especially in remote rural areas to enhance economic growth in the country. Mattoo *et al*. (2006) in a cross-country analysis found that controlling for other growth determinants, countries with open telecom and financial sectors grow faster than their counterparts. Similarly, Jens *et al*. (2007), also found a positive relationship between Foreign Direct Investment (FDI) and domestic manufacturing. Another study by Bayraktar and Wang (2006) found that foreign bank's assets share and economic growth have a positive relationship. Similarly, Eschenbach and Francois (2006), have also found that FDI in domestic financial services has a positive impact on economic growth. Liu *et al*. (2020) concluded that manufacturing exports in developing countries can be enhanced by decreasing the trade barriers.

And finally, the third strand of literature is devoted to studying the impact of various trade policies on services trade and economic growth. Nordas (2011), found that services trade liberalization policies are

important for the industrial purgation of developing countries. Borchert *et al*. (2015), found that conservative service trade policies are adversely affecting the overall trade balances of African countries. Eschenbach and Hoekman (2006) have also found that liberal services trade policies positively affect transition economies' trade and growth performances. Similarly, Mcguire (2002), in a comprehensive study, analyzed comparative advantage for services and export markets for developing economies. It was found that exports of services are limited due to restrictions. And study predicted that trade liberalization of services can be expected to better off these economies by US$ 130 billion. Another comprehensive study by Fontagne *et al*. (2011) estimated tariff equivalents in services for nine services sectors of 65 countries. They found that developed economies are least protected. Transport with 26 percent of average protection is the most liberalized sector while with 75 percent of the average tariff, construction is the most protected sector. Then, there are several studies which show the positive impact of liberal trade policies on total factor productivity (TFP) of downstream firms for almost all type of economies. These studies include Bas (2014) for the Indian economy, Bourlès *et al*. (2013) for OECD countries, Arnold *et al*. (2008) for Sub-Saharan African countries, and Duggan *et al*. (2013) for the Indonesian economy. These results from a very diverse set of economies clearly show the vital importance of trade policies and their effects on economies.

To sum up, a brief overview of the literature suggests that; i) like trade in goods trade in services also depends on comparative costs, ii) trade in services are of vital importance for a modern economy to grow and iii) for enhancing trade in services, countries need to adopt liberal trade policies.

3. MATERIAL AND METHODS

In 1817 David Ricardo proclaimed that the trade bases on comparative advantage. According to the law of comparative advantage, "Even if one nation is less efficient than (has absolute disadvantage concerning) the other nation in the production of both commodities. There is still basis for mutually beneficial trade". The first nation should specialize in the production and export of commodity in which its absolute disadvantage is smaller (This is the commodity of its comparative advantage) and import the commodity in which its absolute disadvantage is greater (this is the commodity of its comparative disadvantage).

For empirical studies measuring this comparative advantage becomes very difficult as pre-trade prices of the countries are difficult to obtain. Liesner (1958) proposed that comparative advantage can be "revealed' through observable trade patterns. Thus this process of studying comparative advantage by this method since then named as revealed comparative advantage (RCA). He gave the following measure of RCA:

$$RCA_A = {X_{ij}}\Big/{X_{nj}} \qquad (1)$$

In equation (1) 'X' represents exports, 'i' is a country, 'j' represents commodity, and 'n' is a set of countries like ECO. This concept of RCA was more refined and formalized by Balassa (1965). According to the Balassa index, exports share of a sector, say sector 'j', is compared with its share in exports of reference country. For example, Balassa index of country A's 'j' sector, BI_j^A, is defined as:

$$BI_j^A = \frac{Share\ of\ sector\ j\ in\ country\ A's\ exports}{Share\ of\ sector\ j\ in\ reference\ country\ exports} \qquad (2)$$

Revealed comparative advantage value ranges from zero to positive infinity. If $BI_j^A > 1$, there is RCA in sector 'j' of country A. This implies sector 'j' is more important for the exports of country 'A' compared to its importance in exports of reference country. Country A should consider specializing in the production of 'j'. If $BI_j^A = 1$, it means sector 'j' has equal importance in the exports of both countries. If the value of RCA is close to zero, it shows the reference country has RCA in 'j', and the country 'A' should not focus

on this sector. Higher RCA index values show greater importance of the sector in exports of the country of interest relative to the other sectors' exports.

The use of this Balassa index has been very popular in empirical studies (Kim, 2019; Altay and Sümerli, 2015; Akhtar *et al*. 2009; Akhtar *et al*., 2008; Hanif and Jafri 2006; Mahmood, 2004). RCA reflects the intrinsic advantage of commodity export and is reliable with changes in the relative endowment of factor and productivity. However, the Balassa index is not without criticism. It has been criticized on the grounds of its poor distribution characteristics: firstly, its distribution is not stable over time and secondly, it has poor ordinal ranking property (De Benedictis and Tamberi, 2004; Yeats, 1985).

According to Deardorff (1985), the usual concepts of comparative advantage and specialization of goods trade can be applied to study the pattern of services trade. Using comparative advantage theory to study services trade has been validated by Sapir and Winter (1994). This study asserted that under perfect competition, the theory of comparative advantage can be applied to trade in services. However, some argue that results of comparative advantage should be interpreted differently when used for services or entirely new theory should be introduced (Melvin,1989). Notwithstanding this on-going debate, the application of the theory of comparative advantage is very popular in empirical studies (Karaalp and Yilmaz, 2013; Siriwardana and Yang, 2007; Bhuyan and Ray, 2006).

This paper uses the Balassa index to analyze trends in exports of services of ECO countries with specific reference to Pakistan. There are many existing studies conducted on different sectors of Pakistan's economy that have utilized this index to measure comparative advantage. Hanif and Jafri (2006) used it in the study of the textile sector, Mahmood (2004) utilized it to study the non-agricultural exports of Pakistan, and Shahab and Mahmood (2013) have used the Balassa index to the comparative advantage of the leather industry of Pakistan compared to China, Iran, and India.

The analysis has been conducted using data for the period 1994-2015. Collection of data has been carried out mainly from World Bank, United Nations Conference on Trade and Development (UNCTAD), World Trade Organization, and ECO National Statistical Offices.

4. RESULTS AND DISCUSSION

This section consists of two subsections. In the first subsection share and growth of services, export is analyzed while the second subsection is developed to construct and analyze Balassa's index.

4.1 Growth and Performance of Services Sector in ECO

This subsection does these tasks; i) compares export of services of ECO with other regional trading blocs, ii) studies balance of foreign trade of ECO countries, iii) analyses the import of services of ECO countries iv) examines the exports of services of ECO countries and in v) explores ranks of ECO countries in world trade of commercial services.

Table 1: Share of Services Exports of Major Regional Trading Blocs in Services Exports of World (%)

YEAR	ECO	SAARC	ASEAN	NAFTA	APTA	EU	MERCOSUR
2002-2004	1.23	1.71	4.51	18.83	6.01	47.40	0.93
2005-2007	1.34	2.59	4.83	16.96	7.66	47.03	1.09
2008-2010	2.14	3.13	5.05	16.36	8.98	45.56	1.27
2011-2013	2.65	3.63	5.77	16.55	9.97	43.06	1.36
2014-2015	2.95	3.88	6.45	17.25	10.75	44.81	1.48

Source: UNCTADSTAT, United Nations Conference on Trade and Development Statistics

Table 1 compares services exports of ECO countries with other major trading blocks of the world. These trading blocks are Economic Cooperation Organization (ECO), South Asian Association for Regional Cooperation (SAARC), Association of Southeast Asian Nations (ASEAN), North American Free Trade Agreement (NAFTA), Asia-Pacific Trade Agreement (APTA), and European Union (EU), and Group of Latin American Countries Comprising Argentina, Brazil, Paraguay, Uruguay, and Venezuela are known as MERCOSUR. The European Union has the highest share of services exports in total exports of services of the world. Although, it declined from 47.40 percent in 2002-2004 to 44.81 percent in 2014-2105. But still, it remained the highest. It is NAFTA, which stood at second place with a share of 18.83 percent in 2002-2004 and 17.25 percent in 2015-16. APTA with third place showed a consistent increase in exports of services throughout the study period. Its share increased from 6.01 percent in 2002-2004 to 10.75 in 2014-2015. SAARC also recorded an increase in services exports share from 1.17 percent in 2002-2004 to 3.88 percent in the period 2014-2015. And at last, position stands MERCOSUR. It recorded a small increase in services exports shares from 0.93 percent in 2002-2004 to 1.36 percent in period 2011-2013. ECO recorded an increase in its share of services exports from 1.23 percent in the period 2002-2004 to 1.48 percent in the period 2014-2015. This consistent increase in the share of exports of ECO countries over the whole study period is an encouraging sign.

Table 2 presents a balance of trade of services for ECO countries. Most of the ECO countries have experienced a negative balance of trade of services for most of the period. The highest negative was experienced by Iran and Kazakhstan that is equal to -20 billion US$ and the lowest negative was experienced by Kyrgyzstan and Tajikistan that is less than -0.3 billion US$. And then there are countries with positive figures. These include Turkey, Pakistan, Afghanistan, and Uzbekistan. Among these, Turkey has the highest positive balance equal to USD 10 billion, Afghanistan figures equal to USD 5.2, and Pakistan figures equal to USD 4.3 billion. Whereas, the highest balance recorded for Uzbekistan is USD 0.8 billion.

Table 2: Balance of Foreign Trade of Services of ECO Countries within the Period 1994-2015 (Mln US$)

Years	Afghanistan	Azerbaijan	Iran	Kazakhstan	Kyrgyz	Pakistan	Tajikistan	Turkey	Turkmenistan	Uzbekistan
1994	--	--	-454	--	--	-646	--	10315	--	--
1995	--	--	-417	--	--	-740	--	11467	--	--
1996	--	--	-380	--	--	-895	--	12876	--	--
1997	--	--	-302	--	--	-974	--	13632	--	--
1998	--	-174	-251	--	--	-1025	--	14818	--	--
1999	--	-467	-321	--	--	-1227	--	8914	-485	--
2000	--	-731	-311	--	-173	-906	--	16215	-694	--
2001	--	-629	-123	--	-157	-765	--	20858	--	--
2002	--	-445	-161	--	-126	-766	--	10473	--	--
2003	--	-412	-243	-2025	-189	-1077	--	20389	--	--
2004	--	-830	-175	-3169	-105	-979	--	12467	--	--
2005	--	-2223	-594	-4886	-29	1788	-36	7957	--	--
2006	--	-3743	-374	-5404	-28	2012	-7	9703	--	--
2007	--	-5082	-710	-8264	-25	-3483	-51	12928	--	--
2008	--	-3992	-729	-13515	-10	-6283	-49	14061	--	--
2009	--	-4164	-767	-14554	-171	-8343	-347	10884	--	--
2010	--	-4934	-102	-19303	156	-8140	-939	9346	--	--
2011	--	-5641	-11957	-16588	-53	-7861	-425	14024	--	--
2012	3000	-3930	-15611	-15731	128	-2762	-146	12582	--	621
2013	5232	-4491	-19667	-19921	-223	4279	-265	10426	--	842
2014	--	-7422	-10687	-16673	129	-2452	-341	12417	--	1216
2015	--	-8028	--	-19317	-348	1077	-381	16654	--	1493

Source: World Trade Organization

Table 3: Imports of Services of ECO Countries within the Period 1994-2015 (Mln US$)

Years	Afghanistan	Azerbaijan	Iran	Kazakhstan	Kyrgyz	Pakistan	Tajikistan	Turkey	Turkmenistan	Uzbekistan
1994	--	--	5313	--	113	3159	--	5745	--	--
1995	--	--	5287	--	176	3345	--	5924	--	--
1996	--	180	4897	--	236	3583	--	6812	--	--
1997	--	296	4139	--	287	3790	--	7468	--	--
1998	--	372	3495	--	331	3800	--	7725	--	--
1999	--	666	4474	--	389	4372	--	9846	580	--
2000	--	1156	5028	--	247	3228	--	13426	1071	--
2001	--	1038	3911	--	255	2771	--	15597	--	--
2002	--	763	3221	--	222	2692	--	14326	--	--
2003	--	805	5405	3515	301	3207	--	18682	--	--
2004	--	1270	6286	4897	251	3361	--	13136	--	--
2005	--	2753	12634	6986	296	3410	141	10760	--	--
2006	--	4501	18061	7907	310	4809	161	12574	--	--
2007	--	5970	11848	11116	386	9273	299	16553	--	--
2008	--	5362	12702	16681	497	14558	352	18813	--	--
2009	--	5858	13881	18337	832	16026	599	20926	--	--
2010	--	7034	17782	24407	900	16685	1232	26317	--	--
2011	--	8161	20700	23244	1384	17616	828	30346	--	--
2012	1603	6943	24012	22060	1237	11738	505	28808	--	415
2013	2435	8009	30772	26015	1385	11974	1066	32142	--	486
2014	--	11325	19504	23204	1555	13594	1531	35338	--	557
2015	--	14190	--	26238	2074	15112	1839	35801	--	659

Source: World Trade Organization

Table 3 shows figures for imports of services by ECO countries. Turkey, Iran, Pakistan, and Kazakhstan are the major importer of the bloc while Uzbekistan and Turkmenistan are having the lowest imports in the bloc. There is a huge difference between the highest importer of services, Turkey, and the lowest importer Uzbekistan. This shows the diversity of the economies in ECO.

Table 4: Exports of Services of ECO Countries within Period 1994-2015 (Mln US$)

Years	Afghanistan	Azerbaijan	Iran	Kazakhstan	Kyrgyz	Pakistan	Tajikistan	Turkey	Turkmenistan	Uzbekistan
1994	--	--	774	--	--	2513	--	16060	--	141
1995	--	--	798	--	--	2589	--	18763	--	167
1996	--	124	812	--	--	2642	--	20752	--	214
1997	--	164	894	--	--	2736	--	21874	--	259
1998	--	198	981	--	--	2775	--	22543	--	288
1999	--	199	1267	--	--	3145	--	18760	95	379
2000	--	425	1919	--	74	2322	--	29641	377	361
2001	--	409	1677	--	98	2006	--	36455	--	310
2002	--	318	1609	--	96	1926	--	24799	--	308
2003	--	393	2974	1490	112	2130	--	39071	--	447
2004	--	440	4533	1728	146	2382	--	25603	--	463
2005	--	530	6699	2100	267	5198	105	18717	--	475
2006	--	758	9356	2503	282	6821	154	22277	--	536
2007	--	888	4752	2852	361	5790	248	29481	--	573
2008	--	1370	5413	3166	487	8275	303	32874	--	660
2009	--	1694	6213	3783	661	7683	252	31810	--	773
2010	--	2100	7558	5104	1056	8545	293	35663	--	962
2011	--	2520	8743	6656	1331	9755	403	44370	--	1196
2012	4603	3013	8401	6329	1365	8976	359	41390	--	1036
2013	7667	3518	11105	6094	1162	16253	801	42568	--	1328
2014	--	3903	8817	6531	1684	11142	1190	47755	--	1773
2015	--	6162	--	6921	1726	16189	1458	52455	--	2152

Source: World Trade Organization

Table 4 presents data of export of services by ECO countries. The clear leader of export of services in the ECO bloc is Turkey with having total export of services worth USD 673.68 billion from 1994-2015. Pakistan being distant second exported services worth USD 131.79 billion during this period. Turkmenistan exported services worth only USD 0.47 billion and lies at the bottom. While Tajikistan being the second last exported services worth USD 5.57 billion.

Table 5: Rank of ECO Countries in World Trade of Commercial Services

Country	Exports	Imports
Afghanistan	158	130
Azerbaijan	79	67
Iran	57	47
Kazakhstan	71	55
Kyrgyz	131	138
Pakistan	83	66
Tajikistan	162	166
Turkey	29	39
Turkmenistan	86	90
Uzbekistan	102	147

Source: World Trade Organization

Table 5 shows the global ranks of ECO countries in exports and imports. It shows ECO countries are not major contributors to the global services trade. Only Turkey finds a place in the top fifty world's exporters and importers while Iran finds its place in the top fifty world importers of services only. Four out of ten ECO countries don't fall in even top hundred countries with Tajikistan being at 162 and 166 ranks in exports and imports! These results show that most of the ECO countries are not global players when it comes to trade-in services.

4.2 Services Exports of ECO Countries: Revealed Comparative Advantage

This subsection presents results on the RCA of Pakistan concerning ECO countries as suggested by Balassa's index. Table 6 presents these results.

Table 6: Revealed Comparative Advantage Index of Pakistan for Different Services (1994-2015)

Service Code	Afghanistan	Azerbaijan	Iran	Kazakhstan	Kyrgyz	Tajikistan	Turkey	Turkmenistan	Uzbekistan
01	3.86	1.02	1.59	0.58	1.82	0.85	1.56	0.58	-
02	3.11	0.16	0.57	0.19	0.12	5.67	0.10	0.52	-
06	0.01	0.10	0.07	1.09	0.14	0.12	0.17	-	-
07	1.13	1.80	19.84	2.03	2.74	0.43	5.27	-	-
10	6.49	11.48	12.24	15.50	12.83	44.32	119.09	-	-
13	0.10	15.18	4.59	0.97	1.61	0.09	0.87	-	-
14	31.92	33.67	12.35	419.36	0.33	1.31	0.00	-	-
15	0.25	0.58	10.59	1.17	0.68	0.44	4.00	-	-
16	0.58	1.99	3.78	0.64	2.25	42.08	0.61	-	-
18	0.13	0.10	0.12	2.32	0.01	-	0.01	-	-
21	14.69	8.15	8.85	4.49	12.06	3.19	33.06	-	-

***Notes**: 01- Transport, 02- Travel, 06- Construction, 07- Communication, 10- Computer and Information, 13- Financial Services, 14- Royalties and License Fees, 15- Other Business Services, 16- Insurance, 18- Personal, Cultural and Recreational Services, 21- Government Services.*

4.2.1 Pakistan Vs Afghanistan

Compared to Afghanistan, Pakistan has the highest RCA in royalties and license fees, and government services. Balassa's index value for these services is as high as 31.92 and 14.69 respectively. A value greater than 1 of Balassa's index shows an RCA for the country. Such a high value of index shows that royalties and license fees are almost 32 times more important to the exports of Pakistan than to the exports of

Afghanistan and government services are about 15 times more important to the exports of Pakistan than of Afghanistan's. For computer and information, transport and travel also, Pakistan has RCA with index values 6.49, 3.86, and 3.11 respectively. As for as communication is concerned Balassa's index value being close to one suggests that this service is of equal importance to both Pakistan's and Afghanistan's export sectors and no one has a clear RCA. For the other five types of services namely construction, insurance, financial services, other business services, and personal, cultural, and recreational services; Afghanistan has RCA. With the highest RCA being in construction services where Balassa's index value is as low as 0.01. It means the export of construction services is 100 times more important to Afghanistan's exports than to Pakistan's. Financial services are 10 times more important to Afghanistan's exports than to Pakistan's.

4.2.2 Pakistan Vs Azerbaijan

Compared to Azerbaijan, Pakistan has the highest RCA in royalties and license fees, financial services, and computer and information. Balassa's index values for these services are 33.67, 15.18, and 11.48. For government services too, Pakistan has RCA and specialization. For insurance and communication, Pakistan has a slight comparative advantage. And transport services are almost of equal importance to the exports of both countries as Balassa's index value is close to 1. For the other four types of services namely other business services, travel, personal cultural and recreational services, and construction services, Azerbaijan has RCA. With having highest RCA in personal cultural and recreational services and construction services. These two services are ten times more important to Azerbaijan's exports sector than to Pakistan's.

4.2.3 Pakistan Vs Iran

Compared to Iran, Pakistan has RCA in eight out of eleven services studied namely transport, communication, government services, insurance, financial services, computer and information, royalties and license fees, and other business services. Pakistan has the highest RCA in communication services having with having Balassa's index value of 19.84. Pakistan has also very high RCA in royalties and license fees and computer and information. Both being almost 12 times more important to the exports sector of Pakistan than to Iran's. Iran has RCA in travel, construction, and personal, cultural, and recreational services. With having the highest RCA in construction.

4.2.4 Pakistan Vs Kazakhstan

Compared to Kazakhstan, Pakistan has RCA in six out of eleven services namely royalties and license fee, computer and information, government services, personal, cultural, and recreational services, communication, and other business services. Pakistan has the highest RCA in royalties and license fees with Balassa's index value 419.36. This shows phenomenal RCA for Pakistan in royalties and license fees. Construction and financial services are of almost equal importance to both Pakistan and Kazakhstan's exports as Balassa's index value is close to 1. Kazakhstan has RCA in transport, travel, and insurance services. And Kazakhstan has the highest RCA in travel with Balassa's index value 0.19. It shows travel services are almost five times more important to Kazakhstan's exports than to Pakistan's.

4.2.5 Pakistan Vs Kyrgyzstan

Compared to Kyrgyzstan, Pakistan has RCA in the export of six services namely: transport, communication, insurance, financial services, computer and information, cultural and recreational services, and government services. Pakistan has the highest RCA in computer and information. This service is almost thirteen times (Balassa's index value equals 12.83) more important to the export of Pakistan than Kyrgyzstan. Export of government services is also very important to Pakistan compared to Kyrgyzstan. In five services; travel, construction, royalties and license fees, other business services, and personal cultural and recreational services, Kyrgyzstan has RCA as suggested by Balassa's index. Kyrgyzstan has the highest RCA in personal, cultural, and recreational services. These services are a hundred times more important to Kyrgyzstan's exports than to Pakistan's.

4.2.6 Pakistan Vs Tajikistan

Both Pakistan and Tajikistan have RCA in five services each while Balassa's index for personal, cultural, and recreational services could not be calculated due to the non-availability of data. Pakistan has RCA in travel, insurance, computer and information, royalties and license fees, and government services. Pakistan has the highest RCA in computer and information. She has also a high RCA in insurance. On the other hand, Tajikistan has RCA in transport, communication, construction, financial services, other business services, and personal, cultural, and recreational services. From which Tajikistan has the highest RCA in financial services with Balassa's index value 0.09.

4.2.7 Pakistan Vs Turkey

Compared to Turkey, Pakistan has RCA in five services while Turkey has RCA in the export of six services. Pakistan has RCA in transport, communication, computer and information, other business services, and government services. She has the highest RCA in computer and information services with Balassa's index value 119.09. In government services to Pakistan has a very high RCA compared to Turkey. Turkey has RCA in travel, construction, insurance, financial services, royalties and license fees, personal, cultural, and recreational services. She has the highest RCA in royalties and license fees. She also has very high RCA in personal, cultural, and recreational services.

4.2.8 Pakistan Vs Turkmenistan

Compared to Turkmenistan, the availability of data permitted to calculate Balassa's index for only two services; transport and travel. In both of these two services, Turkmenistan has RCA and she can do specialization in it.

5. CONCLUSION AND RECOMMENDATIONS

This study was intended to explore the growth, performance and revealed the comparative advantage (RCA) of services exports of Pakistan concerning ECO countries. The growth and performance of services exports of ECO countries are studied with the use of descriptive statistics while the RCA of Pakistan regarding other ECO countries is analyzed by constructing a well-known Balassa index. Results of the study show that with the passage of time composition of exports of services in ECO countries has shifted from traditional services to non-traditional services particularly due to advancement in technology. And Pakistan has emerged as one of the largest exporters of the services among the ECO countries. Its volume of services trade and exports has risen consistently over the study period.

The study found that ECO countries vary significantly in their ranks in commercial services in world trade. It shows the diverse nature of economies as the difference in the ranks ranges between 29 to 162 for Turkey and Tajikistan respectively. RCA index of Pakistan concerning ECO countries provides a clear view that Pakistan has managed to maintain and develop exports of royalties and license fees services and computer and information services over the years. Pakistan has particularly huge potential to exploit its RCA in computer and information services as it has one of the highest percentages of young population.

Thus, the present study recommends Pakistan should spend on the education and training of its youth to enhance its human capital. Due to the limited time and scope of the study, we have focused on the services sector but this analysis can be expanded to the other sectors of the economy to have a complete insight into the comparative advantages for the Pakistan economy.

Acknowledgment:

We are thankful to the anonymous reviewers of the paper for the valuable comments which helped us to improve its quality.

Funding Source:
The authors received no specific funding for this work.

Conflict of Interests:
The authors have declared that no competing interests exist.

REFERENCES

Ahmed, S. A., Kaliappan, S. R., and Ismail, N. W. (2017). Determinants of service export in selected developing Asian countries. *International Journal of Business and Society*, 18(1), 113-132.

Akhtar, N., Zakir, N., & Ghani, E. (2008). Changing revealed comparative advantage: A case study of footwear industry of Pakistan. *The Pakistan Development Review*, 47(4), 695 -709.

Akhtar, W., Sharif, M., & Shah, H. (2009). Competitiveness of Pakistani fruits in the world market. *The Lahore Journal of Economics*, 14(2), 125-133.

Altay, T. B. & Sümerli S. S. (2015). Comparative advantage and the products mapping of exporting sectors in Turkey. *The Journal of Academic Social Sciences*, 3(18), 330-348.

Arnold, J., Mattoo, A., & Narciso, G. (2008). Services inputs and firm productivity in SubSaharan Africa: Evidence from firm-level data. *Journal of African Economies*, 17(4), 578–99.

Balassa, B. (1965). Trade liberalization and revealed comparative advantage. *The Manchester School of Economics and Social Studies*,33, 99-123.

Banga, R., & Kumar, D. (2010). India's exports of software services: Role of external demand and productivity. *Frontier Issues in Technology, Development and Environment*, Annual Conference of IASSI, Madras School of Economics, March 2010.

Bas, M. (2014). Does services liberalization affect manufacturing firms' export performance? Evidence from India. *J. Comp. Econ*., 42, 569–89.

Bayraktar, N., & Wang, Y (2006). Breaking sector openness and economic growth, *World Bank Policy Research*, Working Paper 4019.

Bhuyan, A. R. & Ray, S. (2006). Feasibility study on bilateral FTA within SAARC region. *Report 2, ACE*, Spain.

Borchert, I., Gootiiz, B., Grover, A., & Mattoo, A. (2015). Services trade protection and economic isolation. *The World Economy*, DOI: http://dx.doi.org/10.1111/twec.12327.

Bosworth, B. P., & Collins, S. M. (2008). Accounting for growth: Comparing China and India. *Journal of Economic Perspectives*, 22(1), 45–66.

Bourlès, R., Cette, G., Lopez, J., Mairesse, J., & Nicoletti, G. (2013). Do product market regulations in upstream sectors curb productivity growth? Panel data evidence for OECD countries. *Rev. Econ. Stat*., 95, 1750–68.

Copeland, B., & Mattoo, A. (2008). The basic economics of services trade. In Aaditya Mattoo, Robert M. Stern and Gianni Zanini (Eds.), *Handbook of international trade in services* (pp. 84–129). Oxford and New York: Oxford University Press.

De Benedictis, L. & Tamberi, M. (2004). Overall specialization empirics: Techniques and applications. *Open Economies Review*, 15(4), 323-346.

Deardorff, A. (1985). Comparative advantage and international trade and investment in services. In R. M. Stern (Eds.*), Trade and Investment in Services: Canada/US Perspectives* (pp. 39-71). Toronto: Ontario Economic Council.

Duggan, V., Rahardja, S., & Varela, G. (2013). Service sector reform and manufacturing productivity: Evidence from Indonesia. *World Bank Policy Research Working Paper* 6349.

Eschenbach, F., & B. Hoekman (2006). Services policy reform and economic growth in transition economies. *Review of World Economics*, 142(4), 746–64.

Fontagne, L., Guillin, L., & Mitaritonna, C. (2011). Estimations of tariff equivalents for the services sectors. *CEPII (Centre d'Etudes Prospectives et d'Informations Internationales)*, 20 Avenue de Ségur, TSA 10726, 75334 Paris Cedex 07, France.

Hanif, M. N., & Jafri, S.K. (2006). Financial development and textile sector competitiveness: A case study of Pakistan. *South Asia Economic Journal*, 9(1), 141 –158.

Jens, A., Javorcik, B. S., & Mattoo, A. (2007). The productivity effects of services liberalization: Evidence from the Czech Republic. *World Bank, World Bank Policy Research*, Working Paper 4109.

Karaalp, H. S., & Yilmaz, N. D. (2013). Comparative advantage of textiles and clothing: Evidence for Bangladesh, China, Germany and Turkey. *FIBRES and TEXTILES in Eastern Europe*. 21, 1(97), 14-17.

Kaur, H.S. (2016). Services exports and SAARC countries: A comparative analysis of growth, performance and competitive advantage", *Millennial Asia*, 7(1), 20-41.

Kim, M. (2019). Export competitiveness of India's textiles and clothing sector in the United States. *Economies* 7(2), 47.

Kimura, F., & Lee, H. (2006). The gravity equation in international trade in services. *Review of World Economics*, 1(142), 92–121.

Krugman, P. R. (1986). Introduction to new thinking about trade policy. In P. Krugman (Ed.), *Strategic trade policy and the new international economics*. Cambridge: MIT Press, 1–22.

Langhammer, R. (2002). Developing countries as exporters of services: What trade statistics suggest. *Journal of Economic Integration*, 17(2), 297–310.

Lennon, C., Mirza, D., & Nicoletti, G. (2008). Complementarity of inputs across countries in services trade. *Les Annales d'Economie et de Statistique (The Annals of Economics and Statistics)*, 93/94, 183–205.

Liesner, H.H. (1958). The European common market and British industry. *Economic Journal*, 68, 302-16.

Liu, X., Mattoo, A., Wang, Z., & Wei, S-J. (2020). Services development and comparative advantage in manufacturing. *Journal of Development Economics*, 144.

Mahmood A. (2004). Export competitiveness and comparative advantage of Pakistan's Non-agricultural production sectors: Trends and analysis. *The Pakistan Development Review*, 43(4), 541–561.

Marel, E.V.D. (2011). Determinants of comparative advantage in services. GEM Working Paper 87, Group d'Économie Mondiale, Paris, France.

Mattoo, A., Randeep, R., & Arvind, S. (2006). Measuring services trade liberalization and its impacts on economic growth: An illustration. *Journal of Economic Integration*, 21, 64-98.

McGuire, G., (2002). Trade-in services-market access opportunities and the benefits of liberalization for developing economies. *United Nations Publication*, (19), 1607-8291.

Melvin, J. (1989). Trade-in producer services: A Heckscher-Ohlin Approach. *Journal of Political Economy*, 97(5), 1180-96.

Mitra, R.M. (2013). Leveraging service sector growth in the Philippines. *Asian Development Bank Economics*, 366, 1655-5252.

Nordas, H.K. (2011). Opening the markets for business services: Industrial perspective for developing countries. *J. Econ. Integr*, 26, 306–28.

Ok, W., Lee, K., & Kim, H. (2014). Service-Led catch-up in the Indian economy: Alternative hypotheses on tertiarization and the leapfrogging thesis. *Seoul Journal of Economics*, 27(1), 7–40.

Park, D., & Shin, K. (2012). The service sector in Asia: Is it an engine of growth? *Asian Development Bank Economics*, Working Paper Series No. 322.

Saez, S., & Goswami, A. G. (2010). Uncovering developing countries' performance in trade in services. *Washington, DC*, World Bank.

Sapir, A., & Winter, C. (1994). Services trade. in D. Greenaway, and L. Winters (Eds.), *Surveys in International Trade*. London: Blackwell.

Shahab, S., & Mahmood, M. T. (2013). Comparative advantage of leather industry in Pakistan with selected Asian economies. *International Journal of Economics and Financial Issues*, 3(1), 133-139.

Shingal, A. (2010). How much do agreements matter for services trade? Prepared for the world trade organisation public forum, Geneva, 17 September. In R.M. Stern (Ed.), 2001, *Services in the international economy*. Ann Arbor: University of Michigan Press.

Siriwardana, M. & Yang, J. (2007). Effects of proposed free trade agreement between India and Bangladesh. *South Asia Economic Journal*, 8(1), 21-38.

Teltscher, S. (2002). Export competitiveness and e-services. E-Commerce and Development Report, Part 2, Chapter 9, *UNCTAD*, Geneva, Switzerland.

UNCTAD. (2014). Statistical Database Online. *Geneva*, Switzerland: UNCTAD.

Vernon, R. (1966). International Investment and International Trade in the Product Cycle. *Quarterly Journal of Economics*, 80(2), 190–207.

World Trade Organization (WTO). (2014). Retrieved September 5, 2018, from https://www.wto.org/from https://www.wto.

Yeats A.J. (1985). On the Appropriate Interpretation of the Revealed Comparative Advantage Index: Implications of a Methodology Based on Industry Sector Analysis. *Weltwirtschaftliches Archiv*, 121: 61-73.