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The Sri Lankan Journal of Banking and Finance (SLJBF) is a referred Journal bi-annually published research papers and scholarly work by the Department of Banking and Finance, Wayamba University of Sri Lanka. The main objective of the SLJBF is to publish scientific research findings that address to issues and developments related to economics in general and money, banking, financial markets in particular at both national and international level. All research articles submitted are double blind reviewed prior to publishing. Views expressed in the research articles are not the views of the Department of Banking and Finance, Wayamba University of Sri Lanka or the Editorial Board.

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Department of Banking and Finance

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Editorial Preface

We are pleased to present Volume 3(2) of the Sri Lankan Journal of Banking and Finance (SLJBF), a refereed journal of Banking and Finance published by the Department of Banking and Finance, Wayamba University of Sri Lanka. SLJBF provides a unique platform for researchers, academicians, professionals, and research students to impart and share knowledge in the form of high-quality research papers to infuse innovative systems and methods to the economy and finance as a whole. In line with that SLJBF invites you to join with us by writing quality manuscripts in the discipline of economics, banking and finance.

We received a fair response for the call for papers and out of the paper received five papers selected for the publication through the rigorous blind review process. We wish to thank all the authors who contributed to this issue by submitting their novel research findings. The volume 3(2) of SLJBF deals with timely important topics, FDI Spillover Effects in Sub-Saharan Africa, Customer Perception on Virtual Banking Services of Commercial Banks, Impact of Dividend Policy on Return on Assets, Determinants of Women's Economic Empowerment and Potential for Commercialization of Apiculture as a Biofin Livelihood Option in Anuradhapura District. Thus, the journal has widened its scope to appeal to a wider readership with varied interest and needs.

The first paper by Adamu Jibrilla, Dunusinghe Priyanga presents a very interesting meta-analysis on the impact of FDI spillovers on the performance of firms in the sub-Saharan Africa (SSA). Findings of the study confirmed that there is no evidence of statistically significant FDI spillover effect in SSA However, study reports that FDI spillover effects in SSA are likely to be country specific and among panel studies, depending on the sample size, ownership structure, research and development as well as absorptive capacity of firm.

Zooming into the local context, the second paper by Tharshini and Rajeshwarn examine customer perception on virtual banking services of commercial banks in Trincomalee District. Authors argue that the level of virtual banking and customer satisfaction is higher in the District and results

revealed that virtual banking services quality has a positive impact on customer satisfaction. The model framework developed in this study provides useful information for managers and policy makers for designing appropriate virtual banking systems in order to maintain profitable customers within the banking system.

In the third paper, De Silva, Premarathna and Mapatuna investigate the potentials for commercialization of apiculture as a biofin livelihood option in Sri Lanka. Based on the results, authors concluded apiculture could be introduced as a biofin livelihood option for the fruit and vegetable farmers in the Anuradhapura district in Sri Lanka.

The fourth article is a case study on dividend policy of listed non-financial firms in Colombo Stock Exchange, Sri Lanka. This paper investigates the impact of dividend policy on return on assets. The authors Ravindran and Kengatharan argue dividend policy as a leading factor to be considered to enhance the profitability of the firm. Moreover, authors advocate the importance of maintaining a trade-off between distributions of dividend and retaining a portion out of earnings so as to ensure the sustainability of organization.

The final paper, by Thakshila Kumari, investigates the determinants of women's economic empowerment with special reference to rural poor women in Sri Lanka. This study seeks to identify most influential factors on women economic empowerment in Sri Lanka. The finding of the study is useful for the policy makers to enhance women's economic empowerment.

On this occasion, I would like to extend my sincere thanks to the dedicated panel of distinguished reviewers, members of the editorial advisory board, members of the editorial board and the assistant editors for their unstinting and voluntary contribution to make this issue a success. The continued support of the governing body of the Wayamba University of Sri Lanka in this endeavor is also acknowledged.

Prof. R.A Rathanasiri
Chief Editor
Sri Lankan Journal of Banking and Finance
Department of Banking and Finance
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Volume: 3 Issue: 02 December: 2020

Aims and Scope

The Sri Lankan Journal of Banking and Finance (SLJBF) is a refereed Journal bi-annually published research papers and scholarly work by the Department of Banking and Finance, Wayamba University of Sri Lanka. Sri Lankan Journal of Banking and Finance (SLJBF) publishes theoretical and empirical papers spanning all the major research fields in economics, banking and finance The aim of the SLJBF is to bringing the gap existing in the theory and practice of Economics, Banking and Finance by encouraging researchers, academicians, professionals, and research students to impart and share knowledge in the form of high quality research papers to infuse innovative system and methods to the economic and financial system as a whole. Thus, the journal's emphasis is on theoretical and empirical developments and policy-oriented research in economics, banking and finance.

Core Principles

- Publication in the journal of banking and finance is based upon the editorial criteria cited and the evaluation of the reviewers (each manuscript will be sent two reviewers);
- Priority is given for novelty, originality, and to the extent of contribution that would make to the particular field.
- Conceptual papers based upon current theory and empirical findings and contribute to the development of theory in the domain of Banking and Economics are also welcome.

The journal welcomes and publishes original articles, literature review articles and perspectives and book reviews describing original research in the fields of economics, banking and finance. The core focus areas of the journal include;

- Financial Intermediation
- Bank Solvency and Capital Structure
- Banking Efficiency
- Bank Failure and Financial crisis

- Behavioral Finance
- Corporate Finance
- Corporate Governance and Ethics
- Credit Rating
- Derivative Pricing and Hedging
- Financial Economics and Mathematics
- Financial Engineering
- Financial Modeling and Forecasting
- Financial Risk Management and Analysis
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Volume: 3 Issue: 02 December: 2020

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Sri Lankan Journal of Banking and Finance

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Volume: 3 Issue: 02 December: 2020

Contents

Sri Lankan Journal of Banking and Finance

An endeavor to share knowledge

Volume: 3 Issue: 02 December: 2020

FDI SPILLOVER EFFECTS IN SUB-SAHARAN AFRICA: A META-ANALYSIS

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ABSTRACT

This study employs meta-analysis to examine the effect of FDI spillovers on the performance of firms in Sub-Saharan Africa (SSA). Previous FDI spillover studies in SSA have produced mixed results making it difficult to guide policy making. Evidence has shown that among other factors, publication bias has made some authors to report only results that are consistent with theory or those that are statistically significant. Data for this study were obtained from the previously published FDI spillover empirical studies through google search and other search engines using keywords such as effect of FDI spillovers on productivity of firms, FDI spillovers in SSA, FDI spillovers in Africa among others. We employ the use of funnel asymmetry test (FAT) and precision-effect test (PET) to carry out the meta-analysis by using mixed-effect multilevel and ordinary least squares techniques of analysis where we address the within-study dependency and between-study heterogeneity commonly associated with meta-analysis. We account for different study characteristics of the previous studies to examine the reason for the mixed findings and find that there is no evidence of statistically significant FDI spillover effect in SSA and the reported effects in the existing literature suffer from positive publication bias. This means that studies that reported results with positive estimated coefficients were more likely to be accepted for publication. We recommend that on the one hand, authors should try to

report results dictated by the data instead of theory and on the other hand, policymakers should treat research findings with extreme caution. More research in this area is encouraged in SSA for a much better understanding of the existing discrepancies in the FDI spillover studies.

Keywords: FDI, Technology Spillovers, Meta-analysis, Publication bias, SSA

1. INTRODUCTION

Foreign direct investment (FDI) has been acknowledged by researchers and policymakers as an important instrument of development and a good channel for the transfers of capital, technology and knowledge from industrialised economies to developing countries to boost productivity, employment, economic growth and even infrastructures through both the direct and spillover effects (Javorcik, 2004; Markusen & Venables, 1999; Moran, 2011; Saggi, 2002).

Over the past few decades, Sub-Saharan Africa (SSA) has experienced increasing FDI inflows as reported in figure 1 as the share of FDI inflows in GDP of the region continued to follow an upward trend from 0.07 per cent in 1980 to its highest value of 4.13 per cent in 2001[1] and then settled to 3.24 percent and 2.00 per cent in 2008 and 2018 respectively. During this period, the majority of SSA countries relaxed their investment restrictions and started to pursue more liberal investment policies which include providing incentives for foreign investors in virtually all sectors. The increasing FDI inflows in the region attracted much attention of researchers who examined different dimensions of FDI effects on the region including the spillover effects of FDI on the performance of local firms.

However, the existing studies provide mixed and inconclusive findings regarding the spillover effects of FDI on the performance of firms in SSA possibly due to country specific factors, data, or methodologies employed. Some studies find positive while others have reported zero and even negative results on the effect of FDI spillovers in the region. Therefore, it becomes imperative to combine these findings in order to determine the causes of the discrepancies in the results and the extent to which these findings can be utilized for policymaking and guide future research.

[1] The higher value of FDI inflows of 4.13 as a percentage of GDP recorded in 2001 has been most due to the favourable investment policies adopted by most countries in the Sub-Saharan African region around late 19s. The discovery of oil and other mineral resources in some African countries during this period also contributed to this high percentage of FDI inflows in the GDP of the region.

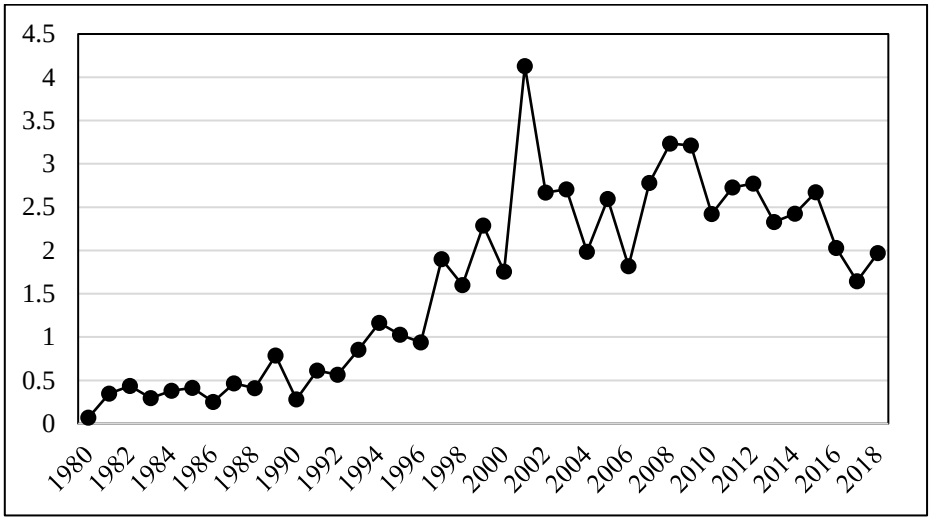

Figure 1: FDI inflows as percentage of GDP in SSA (1980-2018)

Source: Authors' plot based on data from WDI (2019)

Thus, the aim of this is to employ the use of meta-analysis by combining the existing FDI spillover studies in SSA to ascertain the rationale behind such differences in the studies and the extent to which findings these FDI spillover studies in SSA can be generalised and if they can be reliable for policy making. This study is structured as follows: background, review of literature, methodology, findings and discussion as well as conclusion.

Meta-analysis technique has been employed to integrate and summarize the estimates of the previous empirical studies as suggested in the literature. Despite the significant recognition of this meta-analysis, there is paucity of studies using this approach in SSA.

Meta-analysis has become a popular approach in applied economics in recent years for integrating and summarizing several empirical studies and resolving inconsistencies arising from the existing studies (Havranek & Irsova, 2010; Meyer & Sinani, 2005). The pioneer economics studies that employed meta-analysis approach are Ashenfelter et al., (1999) to estimate returns to schooling, Gorg and Strobl (2001), Djankov and Murrel (2002) for enterprise restructuring analysis in transition economies, Gallet and List (2003) for cigarette demand and De Mooij and Ederveen (2003) for elasticities of tax-rate (Meyer & Sinani, 2005). Since then, many studies in economics have employed the use of meta-analysis.

Meta-analysis is used to statistically integrate the empirical estimates of many previous studies that investigated the same phenomenon. Therefore, the meta-analyst collects many existing empirical studies and analyse them to determine the rationale behind the inconclusiveness in the findings. It majorly determines the authenticity of the reported effects (genuine effect) and whether such reported effects are due to publication selection bias.

Publication selection bias is an important concern in meta-analysis because some authors, editors and reviewers may be more likely to publish certain FDI spillover estimates than others. They may likely prefer certain spillover estimates in terms of signs and statistically significance, and in most cases tempted to report and publish positive spillover estimates, especially for developing countries. In other words, researchers, reviewers and editors may be more likely to accept and publish estimates that demonstrate statistical significance and or that are consistent with the predominant theory (Hampl, Havranek & Irsova, 2019).

2. LITERATURE REVIEW

Foreign direct investment has been recognized in both policy and academic contexts as an essential medium of technology and knowledge transfers from developed nations to developing countries through the cross-border activities of multinational enterprises. FDI spillovers have been acknowledged as a transfer of knowledge and technology from foreign-owned firms to domestic owned firms (Hanousek, Kocenda & Maurel, 2010) either through the horizontal channels or through the supply chain relationships (Vertical channels). The main argument in the literature for expecting the transfers of technology and ideas from foreign subsidiaries to local firms is the possession of superior technology by foreign owned firms and also that these firms outperform domestic firms as demonstrated in many previous empirical studies (Sgard, 2001; Javorcik, 2004).

FDI spillovers through the horizontal channels appear to the most controversial and complex channel of technology transfers due to the complexity of the transmission channels. The dominant transmission channels of horizontal spillovers as identified in the literature are competition, imitation or demonstration, and labour turnover or labour mobility (Crespo et al., 2009; Javorcik, 2004,2007).

It has been argued in the literature that the entrance of foreign multinational enterprises into a particular industry in a host country triggers competition in the industry forcing the domestic firms to upgrade their technologies, efficiently employ existing resources, improve their performance and subsequently improve their innovation and productivity (Lenaerts &

Merlevede, 2011; Javorcik, 2007, Blomstrom & Kokko, 1998; Crescenzi et al., 2015). Initially, competition from multinational enterprise may have a crowding out effect on domestic firms where the activities of foreign owned firms would force the inefficient and unproductive local firms out of business allowing only the competitive ones (Narula & Marin,2005; Markusen & Venables, 1999).

The demonstration effect or imitation channel of horizontal spillover is an important channel where domestic firms learn technologies introduced by foreign owner firms through learning-by watching or by imitating the technologies of the foreign firms. This channel proved effective in many emerging economies and it works best for domestic firms that have adequate absorptive capacity.

Labour turnover or mobility has been regarded as an essential horizontal FDI channel of technology and knowledge transfer. The literature demonstrates that technology or knowledge may spillover from foreign to domestic firms through the movement of workers from foreign multinational enterprises (previously working for foreign owned firms) to locally owned firms. The idea is that those workers might have received training and become more familiar with some of the advanced technologies used by foreign firms, and this knowledge is subsequently transferred to domestic firms which is expected to improve their productivity and innovation.

Researchers have argued that it is likely that labour turnover may favour foreign multinational enterprise since they are likely to pay higher wages than domestic firms (Heyman et al. 2007; Taylor & Driffield, 2005, Vahter & Masso, 2018) making it easier for them to attract the most productive workers from locally owned firms. Both anecdotal and empirical evidence have shown that foreign owned firms pay higher wages than domestic firms and therefore they tend to draw the most productive employees from domestic firms (Sinani & Meyer, 2004; Crespo & Fontoura, 2009; Saggi, 2002). However, the hiring and firing of workers by foreign firms and voluntary quitting of jobs by workers of foreign firms may facilitate such labour movement from foreign to domestic firms thereby increasing the productivity of the latter since these workers might have already acquired knowledge from previous employers (Gorg & Strobl,2005; Girma, 2003; Glass & Saggi, 2002).

Given all this, there are mixed findings regarding the effect of horizontal FDI spill over on productivity of firms in the host countries. Some studies find empirical evidence in support of positive horizontal spillover effects (Vahter, 2004; Ayyagari & Kosova, 2010; Damijan et al.,2003b), others find negative effect through this channel (Konigs, 2000; Atieno, 2015) and yet there are studies that find no effect at all (Damijan et al.,2003a).

Other important channels of FDI spill overs are the supply chains, also called vertical spillover channels which occur through the backward and forward linkages between foreign owned firms and locally owned firms in the downstream and upstream sectors. The backward FDI spill overs arise as a result of backward linkages between foreign owned firms and their domestic suppliers of intermediate inputs in the downstream sector. The forward spillovers on the other hand are due to the linkages between foreign owned firms and their domestic customers of intermediate inputs in the upstream sector. Both these supply chain relationships result in the transfer of technology and knowledge from foreign to domestic owned firms through offering of training, technical assistance, deadlines, other related supports provided by the multinational enterprises to their domestic suppliers and customers in the host countries.

Researchers have argued that backward spill over channel is more effective in transferring technology and knowledge because foreign subsidiaries have no incentive to prevent such knowledge to their domestic suppliers since they also benefit from the high quality of inputs from such relationships as a result of the training and guidelines and other technical assistance provided by them. Majority of FDI spillover studies find evidence in support of positive backward spill over effect in the host countries (Boly et al.,2015; Javorcik, 2004; Lenearts & Merlevede, 2017) while very few find evidence of negative backward spillover effect (Di Ubaldo et al., 2018; Dogan, Wong & Yap, 2017). Some of the main reasons attributed to the negative backward spillover effect include proximity to home countries of foreign subsidiaries, internalisation of supply chain and lack of absorptive capacity by the domestic firms.

Forward FDI spill over channel is the least considered channel in the literature but it also tends to be effective for technology transfer since domestic customers benefit from the high quality of inputs, they buy from foreign owned firms which may reduce damages and improve productivity. Some of the few studies that provide evidence of forward FDI spillovers include (Lenearts & Merlevede, 2011).

2.1 FDI Spill overs in Sub-Saharan Africa

The rising importance of FDI inflows in Sub-Saharan Africa over the past few decades has attracted the attention of researchers to examine the effect of FDI on the economy of the region as well as the spillover effect of FDI on the performance of firms in the region. The first study that deeply examined the spillover effect of FDI in SSA was by Amendolagine et al., (2015) using a

novel cross-sectional data collected by UNIDO[2] (2010) in 19 SSA countries. They find evidence of a positive backward spillover effect which was attributed to high demand of local inputs by foreign owned firms as well as firms owned by Africans in diaspora.

Gorg and Seric (2015) used the same dataset of UNIDO (2010) to examine the linkages between foreign subsidiaries and the performance of local firms in SSA taking into account the role of assistance either from foreign owned firms or from the government. They find evidence of both forward and backward spillover effects in increasing the innovation and productivity of domestic firms in the region. Similarly, Amendolagine (2016) and Amendolagine et al., (2016) examine the spillover effect of FDI in the region by considering the role of the investor's country of origin. They show that foreign multinational investors that originated from OECD[3] countries generate more domestic linkages and FDI spillovers compared to firms that originated from BRICS[4] countries. In contrast, Seyoum et al., (2015) examined the effect of Chinese foreign investments on local firms in this case of Ethiopia and find evidence that foreign firms are more productive than domestic firms and they generate positive spillover effects for domestic firms that have adequate absorptive capacity.

Using multilevel analysis, Sanfilippo and Seric (2015) examined the spillover effect of FDI on performance of firms in SSA where they emphasized on the role of agglomerations and find a negative correlation between horizontal spillover and performance of local firms. This result was attributed to the negative competition effect associated with FDI where foreign subsidiaries take away the market shares of domestic firms and crowd out domestic investors.

Atieno (2015) also finds a negative horizontal spillover effect but positive backward spillover effect in the case of Kenyan manufacturing sector. This confirms the argument that backward spillover is most likely to take place due to the fact that foreign owned firms may not want to prevent knowledge spill over to their domestic suppliers because they equally benefit from such relationships. Malikane and Chitambara (2018) also finds a positive but weak evidence of FDI spill overs in SSA countries conditional on the technological gap between foreign and domestic owned firms. Similar outcome was also

[2] United Nations Industrial Organisation (UNIDO) collected a unique firm level dataset from 19 Sub-Saharan African countries in 2010 which gave many researchers the opportunity to undertake extensive studies on FDI spillovers in the region.

[3] This stands for the Organisation for Economic Cooperation and Development and its members consists of developed countries.

[4] This refers for countries of Brazil, Russia, India, China and South Africa which are regarded to be developing countries which are on the path to becoming developed.

shown by Danquah and Amakwah-Amoah (2017) in a group of 45 African countries while Barasa et al. (2019) find a negative outcome for the FDI spillovers for countries within the region.

These differences in the findings have been a matter of concern for both researchers and policy makers because it is difficult to understand the right findings for policy prescriptions. Hence, researchers over the last few years have adopted the use of meta-analysis in the field of economics in order to better understand the genesis of these discrepancies and the possible way forward and how it can be beneficial for policy making especially in developing countries.

2.2 Meta-Analysis and FDI Spill overs

Since the pioneer use of meta-analysis in the empirical investigation of phenomena in economics and business (Ashenfelter et al., 1999; Gorg & Strobl, 2001), many researchers have adopted this research approach in order to understand the rationale behind the divergent findings in the existing FDI spillover literature. Gorg and Strobl (2001) employed meta-analysis to examine the effect of research design and data on the reported FDI spillover effects and showed that model specification and data type (cross-sectional and panel) have influence on the heterogeneity in the previous studies. They also indicated the presence of publication bias in their primary studies.

Similarly, Hanousek, Kocenda and Maurel (2010) employed meta-analysis to examine the direct and indirect effects of FDI in emerging European markets and showed that both the direct and indirect effects become weaker over time. They also detected the presence of publication bias and also showed that research design has effect on the existing empirical results in the literature. This is similar to Demena and Bergeijk (2016) who also examined the effect of FDI spill over on the performance of firms in developing countries and found that FDI spillover effects are affected by publication bias, arguing that such bias overstates the spillover effects.

Harvanek and Irsova (2010) studied the meta-analysis of horizontal FDI spillovers and found a significant effect of research design and publication bias on the results of the previous spillover studies. Wooster and Diebel (2006) examined the spillover effect of FDI on productivity in developing countries using meta-analysis in which they accounted for a variety of research design to determine the aspect that influence the size, significance and sign of FDI spillover effects. They found that the mixed results of the FDI spill overs in developing are partly due to model specification.

3. METHODOLOGY

This study reviews the existing meta-analyses and primary[5] studies in order to analyse the sources of heterogeneity in the existing studies and to understand the genuine spillover effects and whether there is presence of publication bias. All relevant and known published and unpublished FDI spillover related studies in SSA have been identified and reviewed. In line with standard methodology for collecting data for meta-analysis, the relevant primary studies were identified with the use of extensive search engines through the Google scholar, Scopus and Econlit using keywords such as "FDI spillovers in SSA or in Africa", "effects of FDI spill overs on productivity of domestic firms in SSA or in Africa", "FDI productivity spillovers in SSA". Although numerous FDI studies appeared, only studies that relate to FDI spill overs, productivity and domestic linkages, and have reported both the estimates and their standard errors were included in the sample.

Therefore, a total of 18 primary studies as presented in table 1 met our criteria which provided the required data of 1104 observations[6] in which 69 percent is journal and 31 percent consists of working papers and theses. There are thirty-one (31) potential sources of heterogeneity identified, including journal quality coded from the primary studies.

Since the essence of meta-analysis is generally to ascertain the genuine effect and whether there is no publication bias, funnel asymmetry test (FAT) and precision-effect test (PET) have been used in line with previous meta-analyses to determine the publication bias and genuine FDI spillover effects. Funnel plot has been used to obtain the visual suggestion of the degree of publication bias in the primary studies. We address the issue of within-study dependency and between-study heterogeneity by estimating the study-clustered standard errors and by employing the mixed-effects multilevel (MEM) modelling approach and Ordinary Least Squares (OLS). The standard meta-regression model (MRM) is specified as follows:

$$e_{ij} = \alpha + \beta se_{ij} + u_{ij} \quad (1)$$

Where e stands for the FDI spillover estimates from primary studies, se stands for the standard errors and u represents the disturbance terms.

[5] Primary studies are the existing studies that have investigated the FDI spillover effects in SSA which we have used to construct a database for the analysis in this study. We follow the established methodology to arrive at the final dataset used for the analysis.

[6] The 1104 observations were arrived at after eliminating outliers in the data which we considered to impact tremendously on the outcome of the analysis.

It is expected that e_{ij} (spillover estimates) varies randomly around α, and the standard errors (se_{ij}) approaches zero and e_{ij} be independent of their standard errors. We divide equation (1) by the se_{ij} to adjust for the possibility of heteroskedasticity and this method yields the following standard meta-regression model in the form of weighted least square model in which the t-statistics is now the response variable.

$$t_{ij} \equiv (e_{ij}/\, se_{ij}) = \alpha + \beta(\frac{1}{se_{ij}}) + \gamma \boldsymbol{X}_{ij} + \varepsilon_{ij} \qquad (2)$$

Where t_{ij} represents the t-statistics of spillover estimate i from study j and ε_{ij} is ratio of the error term to standard errors in equation (1). The slope of equation (2) estimates the magnitude and direction of a genuine spillover effect (PET) while the constant or intercept term tests for publication bias in the effect (FAT). X_{ij} consists of control variables that account for different sources of heterogeneity in the previous empirical findings of the FDI spillover effects.

The use of t-statistics for meta-analysis has been reported by previous studies (Gorg & Strobl, 2001; Meyer & Sinani, 2005) as appropriate because it is dimensionless as against the magnitude of spillover estimates. We model a list of possible heterogeneity sources, and by following previous meta-analyses, these sources are based on specifications, estimation techniques, data and publication characteristics of the primary studies. All estimations have been carried out using Stata 15.

Table 1: Primary Studies from SSA Employed in the Analysis

S/N	Authors	Country of study	Frequency of FDI Spill over Estimates	Percent	Cumulative percent
1	Amendolagine et al., (2013)	SSA	64	5.80	5.80
2	Amendolagine et al., (2017)	SSA	98	8.88	14.67
3	Atieno (2015)	Kenya	77	6.97	21.65
4	Blanas et al., (2019)	SSA	29	2.63	24.28
5	Boly et al., (2015)	SSA	25	2.26	26.54
6	Demena (2016)	SSA	23	2.08	28.62
7	Dunne and Masiyandima (2014)	SADC	56	5.07	33.70
8	Dutse (2012)	Nigeria	6	0.54	34.24
9	Gold et al. (2017)	SSA	118	10.69	44.93

10	Gorg and Seric (2015)	SSA	188	17.03	61.96
11	Gorg and Strobl (2005)	SSA	74	6.70	68.66
12	Mugendi (2014)	Kenya	12	1.09	69.75
13	Mugendi and Njuru (2016)	Kenya	3	0.27	70.02
14	Perez and Seric (2015)	SSA	28	2.54	72.55
15	Sanfilippo and Seic (2015)	SSA	122	11.05	83.61
16	Seyoum et al. (2015)	Ethiopia	75	6.79	90.40
17	Waldkirch and Ofosu (2010)	Ghana	91	8.24	98.64
18	Yauri (2006)	Nigeria	15	1.36	100.00
	Total		1,104	100.00	

Note: SSA stands for Sub-Saharan Africa while SADC stands for Southern Africa Development Community.

Source: Author Constructed

4. RESULTS AND DISCUSSION

In line with previous studies, the funnel plot for determining the publication bias has been presented in figure 2 which appears to be full and symmetrical. However, the right portion of the funnel seems to be a little heavier than the left portion, suggesting the presence of a positive publication bias of the FDI spillover estimates. This indicates that studies that reported negative FDI spillover estimates were less likely to be accepted for publication or authors were less likely to report negative estimates.

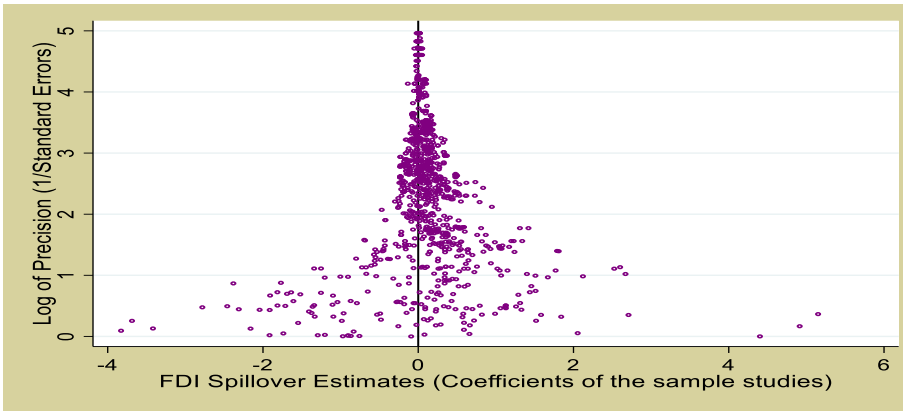

Figure 02. Funnel Plot showing positive publication bias

Source: Authors' plot using data constructed from primary studies

Since visual inspection of the plot may likely be subjective, we present the formal publication bias test using funnel asymmetric test (FAT) as shown in table 2 to confirm the result shown by the funnel plot.

Table 2. Bivariate Meta Regression for FAT and PET Tests

	All samples	Peer-reviewed studies	Studies in High-Ranking Journals
	Dependent variables: t-statistics		
Publication bias (FAT)	$0.950^{***}(0.365)$	$0.848^{*}(0.458)$	$0.751(0.528)$
Genuine effect (PET)	$-0.002(0.007)$	$0.002(0.010)$	$0.005(0.010)$
Observations	1104	764	814

Note: ***, * stands for 1% and 10% level of significance respectively. Mixed-effects multilevel estimation technique with study-clustered standard errors is used to correct for possible heterogeneity as well as within-study dependency.

Source: Author Constructed

The FAT reveals that a positive publication selection bias is strongly significant for the full sample, confirming the result of funnel plot in figure 2, though the bias decreases with the quality of studies published. Peer-reviewed papers show evidence of a weak positive publication bias whereas studies published in leading journals show no evidence of a significant publication selection bias. The magnitudes of the bias also decrease accordingly.

Similarly, the precision-effect test (PET) which estimates the genuine effect, shows that for the full sample, FDI spillover effect is negative while it is positive for both peer-reviewed and leading journals. However, the coefficients are not statistically significant. This result implies that the reported FDI spillover effects in SSA may be due to publication bias but studies published in leading journals are free from such selection bias. The insignificance of the genuine-effect coefficient implies that no significant positive FDI spillover effect has taken place in the Sub-Saharan African region.

Table 3. Reduced-form Multivariate Meta-Regression for Sources of Heterogeneity

	Model 1 Mixed-effect multilevel (MEM)	Model 2 Ordinary Least Squares (OLS)
	Dependent variable: t-statistics	
Bias (intercept)	$6.434^{***}(0.028)$	$6.441^{***}(0.056)$

Specification		
Joint ventures	$3.129^{***}(0.136)$	$3.176^{***}(0.201)$
Absorptive capacity	$2.871^{***}(0.064)$	$2.883^{***}(0.101)$
Firm age	$0.520^{***}(0.123)$	$0.480(0.376)$
R&D	$0.685^{***}(0.116)$	$0.720^{***}(0.136)$
Firm size	$-2.319^{***}(0.065)$	$-2.302^{***}(0.202)$
Exporter	$-0.348^{***}(0.093)$	$-0.364^{***}(0.107)$
Estimation method		
FGLS	$-6.491^{***}(0.304)$	$-6.583^{***}(0.339)$
Random effect	$-4.096^{***}(0.279)$	$-4.178^{***}(0.336)$
Tobit	$-2.967^{***}(0.048)$	$-2.986^{***}(0.176)$
GMM	$3.343^{***}(0.084)$	$3.323^{***}(0.052)$
Data		
Time span	$-1.062^{**}(0.030)$	$-1.071^{**}(0.047)$
Cross section	$-3.140^{***}(0.123)$	$-3.175^{***}(0.149)$
Panel	$3.246^{***}(0.182)$	$3.304^{***}(0.397)$
Country specific	$2.964^{***}(0.173)$	$3.017^{***}(0.196)$
Sample size	$0.0002^{***}(0.0001)$	$0.0002^{***}(0.0001)$
Publication		
Peer-reviewed journal	$-3.454^{***}(0.108)$	$-3.485^{***}(0.133)$
Leading journal	$0.815^{***}(0.086)$	$0.840^{***}(0.173)$
Observations	1013	1013
Sd (Residual)	2.356 (0.170)	
95% Conf. Interval	[2.046 , 2.713]	

Note: Note: ***, * stands for 1% and 10% level of significance respectively. Mixed-effects multilevel estimation technique with study-clustered robust standard errors is used to correct for possible heterogeneity as well as within-study dependency reported in model 1. Model 2 is estimated using OLS with study-clustered robust standard errors as robustness check and the results do not appear to differ significantly. FGLS stands for feasible generalised least squares and GMM stands for generalised method of moment. General -to-specific modelling approach is used to arrive at the reduced form models which provided only significant estimates. The genuine effect (precision variable) is dropped because it appears to be statistically insignificant repeatedly.

Source: Author Constructed

There are many factors that can explain the heterogeneity in the existing empirical spillover findings in SSA. These factors incorporate the research

design and other factors that could affect the results of previous studies. We account for most of these factors following previous studies and report the reduced-form multivariate meta-regression results for the potential sources of heterogeneity as presented in table 3. Generally, we control for model specifications, estimation methods, data type, and quality of publication of the studies.

The study characteristics or sources of heterogeneity appear to have divergent influence on reported FDI spillover effects. The specification of the studies has a strong influence on reported FDI spillovers in SSA as joint venture, absorptive capacity, firm age as well as research and development increase the reported FDI spillovers whereas firm size and exporter firms reduce them. The reported FDI spillover estimates in SSA are also strongly influenced by estimation methods with studies using GMM being 3.3 percent more likely to find positive FDI spillovers. On the other hand, studies that employ FGLS, random effects and tobit methods tend to find negative spillover effects.

Similarly, reported FDI spillover effects also depend on the characteristics of data used as such effects decrease with the time-span of the data and cross-section studies, whereas panel and country-specific studies increase the spillover effects. In other words, studies employing longer time span and cross-sectional data are strongly likely to report negative FDI spillovers while panel, country-specific and studies that employ large sample are more likely to find positive spillovers. In the same vein, while studies published in peer-reviewed journals are more likely to report negative spillovers than working papers and theses, those published in leading journals increase the chances of finding positive FDI spill overs in SSA and they are free from publication bias.

However, accounting for the study characteristics, does not reduce the positive publication bias rather the bias increases for the full sample. This indicates that studies are more likely to report positive FDI spill over estimates irrespective of the significant influence of the sources of heterogeneity or the study design. The results show that, on the average, for every FDI spillover study undertaken, the positive publication selection bias increases by 6.4 units, holding other factors constant. Therefore, the lack of evidence for the genuine effect may largely be due to the publication selection bias which means that significant FDI spillover effect might not have taken place in SSA. This indicates that FDI in SSA does not significantly improve the productivity of domestic firms which may partly to the high concentration of foreign multinational enterprises in the extractive industries and the infrastructure deficiency in the region.

5. CONCLUSION

This study uses meta-analysis to analyse the findings of the previous FDI spillover studies in SSA. The study reveals important findings that are consistent with the majority of the previous meta-analyses in the field of FDI spillover literature and have potential policy implications. Essentially, the reported positive spillover effects in the primary studies cannot be supported statistically and these studies have been found to suffer from severe positive publication bias with the exception of studies published in high-ranking journals. However, positive FDI spillover effects in SSA are more likely to be country-specific and among panel studies, depending on the sample size, ownership structure, research and development, as well as absorptive capacity of firms.

There is no evidence of a significantly genuine effect from FDI spillovers in SSA and there is a large case of publication selection bias. This has a great policy implication especially in the time when Sub-Saharan African governments are in need of a policy guide. Therefore, results from the existing FDI spillover studies in Sub-Saharan African countries must be treated with extreme cautions and policymakers should rely more on studies published in high and reputable journals because this finding shows that publication bias is likely in studies published in these journals.

Since studies published in other journals are mostly contaminated with publication bias, their findings may be less reliable for policymaking. This is because the reported FDI spillover estimates may not necessarily represent the true reflection of the reality of benefits that domestic firms gain from the foreign presence since researchers may be more likely to report positive results.

It is important that researchers and publishers adhere to research and publication ethics rather than giving too much preferences to studies that produced estimates which are in line with existing theory. This may aggravate the proliferation of publication bias among the researchers and publishers which may be misleading for policymaking. There is also a need for more studies on FDI spillovers in SSA using the meta-analysis techniques to provide much better understanding of the differences in the existing empirical literature as research in this area is very limited in SSA.

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AN EMPIRICAL EXAMINATION OF CUSTOMER PERCEPTION ON VIRTUAL BANKING SERVICES OF COMMERCIAL BANKS IN TRINCOMALEE DISTRICT

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ABSTRACT

Banks are the financial intermediates which have contributed a lot for the economy of the country and there have been lots of changes taking place around the world. The major change implemented in the recent past is virtual banking. Objectives of the study have threefold *firstly*, to identify the level of virtual banking service quality offered by commercial banks in Trincomalee district, *secondly*, to identify the level of customer satisfaction of virtual banking of commercial banks in the district, *thirdly*, to examine how virtual banking service quality influence on customer satisfaction of commercial banks in the district. The survey was conducted within the customers of commercial banks in the district who have virtual banking connections. Primary data were assembled through a set of questionnaires issued to customers and 390 respondents were selected as a sample for this survey by using convenience sampling method. There were six hypotheses developed to evaluate the impact of customer perception in relation to virtual banking. Data were analysed with the help of descriptive, bivariate and multivariate analysis. Results show that the level of virtual banking service quality as well customer satisfaction of virtual banking of commercial banks are higher level in the district. The empirical findings concluded that virtual banking

service quality has a positive influence on customer satisfaction. Further, it emphasizes that privacy, fulfilment and responsiveness are having greater influence on customer satisfaction of virtual banking in Trincomalee. Nevertheless, efficiency, system availability and compensation are not significantly influenced on customer satisfaction. Moreover, compensation does not reflect a valuable relationship with customer satisfaction. The study has given a model to understand the real influence of virtual banking service quality on customer satisfaction and needful recommendations are also discussed.

Keywords: e-Banking, e-Customer Satisfaction, Service quality, Virtual Banking

1. INTRODUCTION

Every industry spots light that good service quality is the key success of bringing better customer satisfaction. It is not exceptional to banks as banks are the financial service providers and their success depends on the amount of service quality offered to customers (Andaleeb, Rashid, & Rahman, 2016). The financial world is eager to capture the new developments in virtual banking since they have experienced that it has a huge influence on the financial performance of the economy in developed countries (Cajetan, 2018). Virtual banking means that customers can open accounts, deposit money, obtain loans, and perform other banking services through web, email, mobile app and ATM without visiting a physical bank (Li & Zhong, 2005; Steven, 2002). Banks offer virtual banking services via electronic channels to cope up with incredible changes in the competitive world.

E-banking users not only expect the online process of banking but also, they expect better service, good customer experience, brand name, product strength (Barquin & Vinayak, 2015). As a service sector, consumers are the major stakeholders of banking industry (Islam & Niaz, 2014). Managing customers with extreme levels of satisfaction helps to retain the customers and survive the banking industry for many years in the competitive environment by maintaining a gainful relationship with customers rather than providing just a product or service (Alfrin, 2012).

Banks adopt virtual banking as it diminishes the operational cost of banks. Similarly, customers also desire it as it provides secured quick service in whole days. Further, service quality of online banking enhances the satisfaction level of existing customers as well as potential customers (Cajetan, 2018). Therefore, presently banks concentrate to generate perceived service quality to customers through virtual banking services to retain them with satisfaction (Andaleeb et al., 2016).

In the meantime, banks in emerging countries like Sri Lanka also step forward into this concept with the growth of dimensions in virtual banking services and it has been penetrating in different market segments with competitive and innovative features to enhance the competitive advantage. All commercial banks are offering almost the same products and services with little differences in Sri Lanka. The time is emerging to enlighten the importance of digital banking to customers as it is identified as an important tool to maintain close and stable relationships with the customers. Banks have to take initiatives to identify the customer preferences and take necessary actions to deliver quality services which can provide extreme customer satisfaction and loyalty (Zeithaml, Parasuraman & Malhotra, 2000). Therefore, Sri Lankan banks invest more on electronic banking modernization, implementing new strategies and various marketing efforts to upgrade the service quality of online banking (Albert, Goes, & Gupta, 2004).

Most of the Sri Lankan commercial banks' annual reports reveal that the customer's tendency to move towards digital banking is continuously increasing within the recent years. Some of the extractions are subsequently highlighted as evidence. Details were extracted from Bank of Ceylon (2017), "Customers registered for Smart passbook 41,567", "67% growth observed on e-statement registration", "Bank has invested 3.6Bn in the development of physical and digital infrastructure", "62.9Mn ATM transactions recorded". As per Hatton National Bank PLC (2017), "Online transaction value increased to 23.8% and an increase of 31.9% observed in online transaction numbers validity", "Out of the total withdrawals 82.5% of withdrawals were carried out through ATM network", "HNB has invested 632 Million in technology". Moreover, according to Commercial Bank of Ceylon PLC (2017), "86,662 customers enrolled for e-passbook", "There is a growth of 16.44% observed in online banking users and 25.90% of growth identified in mobile banking usage", "Online banking customers increase to over 800,00".

Though banks in Sri Lanka invested a large amount in the infrastructural development of technological DNA still a significant segment of people prefer the old-fashioned banking. Especially the people in rural areas still believe that cash is the preferred option to do transactions. According to 2018 statistics, the proportion of people living in urban areas in Sri Lanka is just 19% and the remaining people are in rural areas. They are still expecting the face-to-face interaction and beyond the screen relationship. Thus, the recent fully pledged paperless digitized convenient mobile APPs launched by Sri Lanka Commercial Banks within the recent two years (FriMi – NTB, FLASH-Commercial Bank of Ceylon PLC, NDB neos – NDB) could not reach the entire customers. The market is penetrating to digitalization however the move is slow compared to the technophobic countries (Euromoney, 2019).

On the other hand, Jayasiri and Weerathunga (2008) and Premaratne and Gunatilake (2016) pointed out that online banking usage is very low level in spite of literacy level and technology adoptions which were comparatively high in Sri Lanka. In 2020, CBSL states that out of the 23Mn debit cards issued in the market just 15% of cards are in the circulation of making payments. This highlighted that the majority of the public know the usage of virtual banking though they are reluctant to perform all the transactions through virtual banking due to privacy and security issues.

The user habit and behaviour of the public is identified as the main barrier for adopting digital banking since, they are struggling to change their conventional banking aspects due to there is a huge difference to perceive the service quality through web based virtual banking which is entirely different from the traditional banking (Alsajjan & Dennis, 2010). Furthermore, some of the customers have reported displeasure of online banking in Sri Lanka such as unable to reach call centres immediately, security issues, applications are designed in English, issues in withdrawing cash in ATM amongst others, albeit there are advantages in virtual banking. Moreover, the Central Bank of Sri Lanka (2020) declared 2020 as the year of digital transaction in order to minimize the usage of cash where WHO revealed that currency notes can carry Coronavirus.

Hence, identifying the problems associated with the usage of virtual banking service quality of commercial banks in Sri Lanka is utmost important to safeguard the data, identify the virtual banking process in the country, customer satisfaction level towards virtual banking and to take care of the wealth of customers which directs to customer satisfaction. A very few research studies were conducted in the topic of customer perception towards virtual banking service quality in Sri Lanka did not not touched the entire virtual banking concept. It is difficult to conduct the research considering the entire country within the limited time. Therefore, selecting a district which represents the whole country in all aspects like people with cultural differences, various economic scales, different educational backgrounds, proportion of technological acceptance, the recent developments in the banking environment and the lack of empirical studies in the geographical area have led to conduct the research in Trincomalee district. Furthermore, it attempts to fill the gap by adding empirical evidence with the existing body of knowledge about how virtual banking service quality influences customer satisfaction of commercial banks in Trincomalee district. Objectives of the research are as follows,

- To identify the level of virtual banking service quality offered by commercial banks in Trincomalee district.
- To identify the level of customer satisfaction of virtual banking of commercial banks in Trincomalee district.

- To examine how virtual banking service quality influences customer satisfaction of Commercial banks in Trincomalee district.

The remainder of the paper commences with reviewing trends in virtual banking. This is followed by methods of the research are given. Pen ultimately, results are discussed. Finally, conclusions, implication of the study and future research opportunities are presented.

2. LITERATURE REVIEW

2.1. Theoretical background for virtual banking

Various customer perceptions of adoption and acceptance of virtual banking are dramatically focused by researchers as it highly influences on the customer attitudes, user behaviour and customer satisfaction. Theoretical approaches have been used by many scholars to investigate the acceptance and adoption of technology usage which is very relevant to predict the relationship of customer attitude and belief in virtual banking. The most accepted theories are Technology Acceptance Model (TAM), Theory of Planned Behaviour (TPB), Innovation Diffusion Theory (IDT) and Theory of Reasoned Action (TRA).

Out of these, TAM has been proved that this is the widely accepted theory to predict technology adoption behaviour which is related to the variables of perceived usefulness and perceived ease of use (Chaouali et al., 2016; Mital et al., 2018). However, some studies based on this model proved that this model has to extend due to its insufficient guidance in network influences and securities in e-banking (Koo et al., 2015). TPB is used to predict the intention of an individual's behaviour which is influenced by the attitude of the user. IDT consists of five characteristics of innovations that are affecting their diffusion. Those characteristics are, relative advantage, compatibility, complexity, trial-ability, and observability (Shy, 1997; Dandago & Rufai, 2014).

The integration of TAM, TPB and IDT is best suited to examine the virtual banking services as acceptance and process of technology adoption have been proved in several researches (Awa et al., 2015; Motak et al., 2017; Chen, 2016). While several indicators are derived from the above three theories, some other e-service qualities and customer satisfaction variables are also taken into consideration as this study focuses to gain in depth understanding of the phenomenon between service quality and customer satisfaction pertaining to virtual banking services.

2.2. Virtual Banking

Virtual banking can explain the offering of banking services to the customer's door step through electronic devices in a secured and fastest way (Shahriari, 2014). Customers can perform innovative services through digital platforms which leads to better experiences. It can deliver better quality services to cater the customer aspirations by fastest and convenience transactions 24/7 access. This can fulfill unmatched customer satisfaction than the traditional banking system and routed to long term customer relationships by providing accurate information (Nupur, 2010). Mobile stats of the US reveal that 89% account holders use mobile to manage their accounts and just 20% of consumers are still visiting the branch premises. Banks from time to time introduce new developments in virtual banking products and services for changing behaviour of customers and try to retain the existing customers and attract untapped customer segments (Nimako, Gymfi & Wandaogou, 2013; Priyanath, 2018).

2.3. Customer Satisfaction

The overall experience of the customer about a product or services they purchase compared with their expectation is known as customer satisfaction. Kottler (2000) defined customer satisfaction as "a person's feelings of pleasure or disappointment resulting from comparing a product's perceived performance or outcome in relation to his/her expectations". Customer satisfaction is an important tool used by the banks for stand out for years by delivering pleasurable customer experience in the competitive market. Customers expect a consistent experience through Omni channels and it's the bank's responsibility to deliver the services without resistance. Though banks introduce new products, customers concern how they respond to them and how they solve the problems in relation to the services they access.

SERVQUAL model, introduced by Parasuramn, Zeithmal and Berry (1985), was used to analyse the gap between customer's expectations and customer's perception. Tangibility, reliability, responsiveness, empathy, assurance are the service quality dimensions identified through the SERQUAL model. Customer satisfaction is about a firm's service quality which can be evaluated by comparing customer's expectation and customer's perception of the actual services delivered to the customers. If perception exceeds the customer expectation this is considered as ultimate customer satisfaction. Different models were applied by scholars to understand the customer satisfaction in various contexts. However, in this study it is more appropriate to use a customer satisfaction model developed by Chen, Hsiao & Hwang (2012) to evaluate customer satisfaction based on the dimensions content, accuracy, ease of use, timeliness and safety due to the problems analysed in related to customer perception of virtual banking acceptance.

2.4. Virtual banking service quality and customer satisfaction

Virtual banking service quality is explained by the overall judgment of the quality of services consumed by the customers through the digital banking network (Zeithaml et al., 2002; Amin, 2016). E-satisfaction is the pleasant and positive experience of the customer from the E-service delivery of the banks and financial institutions. Service quality and web site designs are the main two factors that influence e-customer satisfaction (Kim, 2005). This research is trying to find out to what extent the quality of virtual banking services offered by banks would contribute to the satisfaction level of customers based on customer's perception of Trincomalee. Several researches carried out in various countries to find the relationship between e-banking service quality and customer satisfaction in different perspectives.

According to the research conducted in Pakistan on impact of e-banking on customer satisfaction based on the key dimensions of SERQUAL model and emphasizes that people evaluate e-banking service quality mainly on three key dimensions: Responsiveness, Reliability and Assurance (Toor et al., 2016). Some researchers pointed out those e-banking services help to retain customers with good customer satisfaction (Martins et al., 2014). Ranaweera and Neely (2003) stated that E-service quality is the initial step which develops customer satisfaction. A research carried by Adil (2013) verified that quality services retain the customers with the bank and illustrated there is a direct relationship between electronic service quality and customer satisfaction.

In Sri Lanka, most of the previous researches focused on the customer satisfaction only for the usage of internet and mobile banking. There are several researches conducted to identify the factors influencing the adoption of internet banking (Jayasiri, Gunawardana & Dharmadasa, 2016), mobile banking and the impact of internet banking on customer satisfaction (De Silva & Abeysekara, 2012). However, these researches do not consider the entire virtual banking services provided by banks and to analyse how these service qualities impact on customer satisfaction. Tharnikaran et al. (2017) conducted within the e-banking users who have accounts in licensed commercial banks in Batticaloa district to identify the customer satisfaction considering the e-service quality dimensions: efficiency, system availability, fulfilment, privacy, responsiveness, compensation.

Table 1: E-service dimensions used in different contexts

Authors	Dimensions	Context
Yoo and Douthu (2001)	Ease of use, aesthetic design, processing speed, and security (SiteQual)	Online retailing
Parasuraman et al. (2005)	Efficiency, system availability, fulfillment, privacy, responsiveness, compensation and contact (E-S-Qual and e-RecS-Qual)	E-service
Akinci and Aksoy (2010)	Based on Parasuraman et al. (2005) e-service quality model: efficiency, system availability, fulfillment, privacy, responsiveness, compensation and contact (E-SERVQUAL)	E- banking
Zavareh et al., (2013)	Assurance, fulfillment, efficiency, system availability, privacy, contact-responsiveness, and website aesthetics and guide	E Banking
Amin (2016)	Personal Need, Site organization, User Friendliness, Efficiency of website	Internet Banking
Toor et al., (2016)	Dimensions of SERVQUAL Model Reliability, Responsiveness, Assurance, Tangibles, Empathy	E- banking
Tharanikaran et al., (2017)	Efficiency, system availability, fulfillment, privacy, responsiveness, compensation and contact	E-banking
Priyanath, (2018)	E-service quality model: efficiency, system availability, fulfillment, privacy, responsiveness, compensation and contact	Internet Banking
Zhou et al., (2019)	Functional completeness, performance, interface and interaction quality, content and information, support or service	E- services in telecom
Sathiyavany and Shivany (2018)	Website design, Content, E-trust, E-convenience, E- cost effectiveness, E-response/Support	E-banking
Aruna (2019)	Accessibility, Awareness, Bank functions, Cost, Ease of Use	Internet Banking

Source: Author Constructed

As per the Table 1, numerous models were developed by various scholars to evaluate the e-service quality in different countries with different perspectives and it has been found that E- SERVQUAL developed by Parasuraman (2005) is identified as the best model to suit the analysis of e-service quality since it is the conjuncture of two different models of E-S-QUAL (dimensions of

efficiency, fulfilment, system availability and privacy) and E-Rec-S-QUAL (Dimensions of Responsiveness, compensation and contact) which has been used and accepted by many researchers to test the e-service quality. Hence, this research also tries to examine the virtual banking service quality by considering the e-service quality dimensions to obtain best understanding.

3. METHODOLOGY

A positivist perspective was applied to identify how virtual banking services offered by banks influence customer satisfaction in Trincomalee district through the customer's perceptions.

3.1. Conceptual Framework of the research

Conceptual Framework of the study is shown in Figure 1.

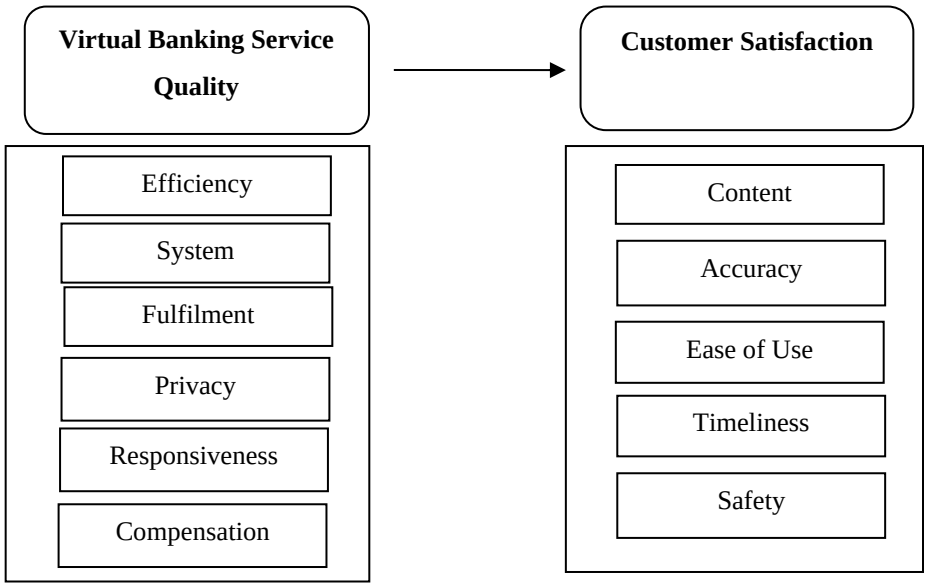

Figure 1: Conceptual Framework of the research

Source: Parasuraman et al., 2005; Chen et al., 2012

Efficiency: The ability of accessing the system easily and trying to find out the preferred services and information without spending too much time and struggle (Zethaml et al., 2002). Previous studies highlighted that efficiency has a significant impact on customer satisfaction (Akinci et al., 2010;

Herington and Weaven, 2009; Zethaml et al., 2002; Priyanath, 2018). Therefore, the following hypothesis is formulated.

H1: There is a significant positive relationship between efficiency and customer satisfaction in virtual banking of commercial banks in Trincomalee district.

System availability: How the website or system is organized for business with correct technical functions and the operating ability of the website. Zeithaml et al. (2000), Ling et al. (2015), Zeithaml et al. (2002), Priyanath (2018) concluded that system availability enhances the customer satisfaction. Therefore, the relevance of system availability in virtual banking hypothesis as follows.

H2: There is a significant positive relationship between system availability and customer satisfaction in virtual banking of commercial banks in Trincomalee district.

Fulfilment: Ability to offer promised services consistency with the same expected standards which fulfil the expectations of customers within a time frame (Zethaml et al., 2002). Fulfilment has been identified as an essential predictor for customer satisfaction (Toor et al., 2016; Nupur, 2010; Akinci et al., 2010). Hence, this research study hypotheses that,

H3: There is a significant positive relationship between fulfilment and customer satisfaction in virtual banking of commercial banks in Trincomalee district.

Privacy: Data governance and data security assures safety transactions and brings trust to customers that banks have the ability to maintain their financial and personal information confidentiality (Ling et al., 2015). Previous research emphasized that privacy has a positive influence towards customer satisfaction (Tharanikaran, 2017). Hence, the following hypothesis is presented.

H4: There is a significant positive relationship between privacy and customer satisfaction in virtual banking of commercial banks in Trincomalee district.

Responsiveness: The tendency of responding customers immediately in order to provide timely services (Parasuraman et al, 1988). Several researchers concluded that responsiveness has the ability to exceed the level of customer satisfaction (Sakhaei et al., 2014; Zeithaml et al., 2002; Nupur, 2010; Toor et al., 2016). Hence, the relevance of responsiveness hypothesis that,

H5: There is a significant positive relationship between responsiveness and customer satisfaction in virtual banking of commercial banks in Trincomalee district.

Compensation: The bank's ability to compensate the losses occurred to the customers due to inconvenience and unexpected problems that arise while performing transactions through digital channels (Kumbhar, 2011). It has been proved in several researchers (Parasuraman et al., 2005; Akinci et al., 2010; Tharanikaran et al., 2017; Priyanath, 2018). Therefore, the following hypothesis has been developed,

H6: There is a significant positive relationship between compensation and customer satisfaction in virtual banking of commercial banks in Trincomalee district**.**

3.2. Sampling and Data analysis

3.2.1. Population and sampling

The population selected for this study was the customers who enjoy any mode of virtual banking services provided by state and private sector commercial banks in Trincomalee district. Krejcie and Morgan (1970) (cited in Sekaran, 2007, p.294) stated that a maximum 384 respondents are sufficient to conduct a large population. By considering the argument, 390 customers who have virtual banking connections in various commercial banks of Trincomalee were selected as a sample. Convenience sampling was used to select the respondents due to the difficulty of obtaining details of virtual banking customers from the banks in Trincomalee.

3.2.2. Data Collection and Analysis

It was a quantitative research where primary data were gathered through a set of questionnaires and measured by using a 5-point Likert scale. Secondary data were gathered through the banks' websites by referring to the annual reports and related publications. SPSS version 22 was used to analyse the data. Descriptive analysis, Pearson's correlation and multiple regression were used to analyse the primary data collected from the respondents. The descriptive analysis has considered being most appropriate to evaluate the variables based on individual responses which include percentages, mean value and standard deviation. The mean value (X) ranges and decision attributes are as follows,

$1.0 \leq X < 2.5$ Lower level
$2.5 \leq X < 3.5$ Moderate level
$3.5 \leq X \leq 5.0$ Higher level

4. DATA ANALYSIS AND FINDINGS

4.1. Reliability Test

Total of 413 filled questionnaires received. Out of that only 390 were completely fit to use this research study, the rest of the 23 were incomplete. Cronbach's alpha reliability test was carried out to evaluate the internal reliability of the items measured. The overall Cronbach's value is found as 0.919 (Table 2) and it suggests a strong reliability according to George and Mallery (2003).

Table 2: Reliability Test

	Cronbach's Alpha	No of Items
Total Reliability	0.919	38

Source: Survey data, 2019

4.2. Univariate Analysis

4.2.1. Respondents by Banks

Table 3 reveals that customers having virtual banking connections with private and government sector banks in Trincomalee district were selected as respondents for the purpose of this study. Out of this 390 customer's majority of the respondents are dealing with the two state banks with 41% due to most of the government employees' salaries are directed to these banks. Followed to this, two main private sector banks Commercial bank of Ceylon and Hatton National Bank are 18% and 13% respectively. Rest of the 38% respondents are dealing with all other remaining banks.

Table 3: Respondents by Banks

Bank	**Frequency**	**Percent**
Hatton National Bank	49	13.0
Commercial Bank	72	18.0
BOC	92	24.0
People's Bank	65	17.0
Sampath Bank	35	9.0
Seylan Bank	25	6.0
NDB	22	6.0
DFCC	9	2.0
NTB	12	3.0
Others	9	2.0

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Hatton National Bank	49	13.0
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DFCC	9	2.0
NTB	12	3.0
Others	9	2.0
Total	**390**	**100.0**

Source: Survey Data, 2019

4.2.2. Most preferable virtual banking channel

Table 4 indicates that 41% of respondents prefer ATM networks, 29% of customers prefer internet banking and 28% of respondents prefer mobile banking. Almost all customers give the same preference to internet banking and mobile banking.

Table 4: Most preferable digital banking channel

Virtual banking channel	Frequency	Percent
Internet banking	112	29.0
Mobile banking	109	28.0
ATM	160	41.0
Others	9	2.0
Total	**390**	**100.0**

Source: Survey Data, 2019

4.2.3. Mostly carryout virtual banking services

As per the Table 5, Most of the respondents are inquiring account balances (20%), view transaction details (18%), performing fund transfers (20%) and withdrawing cash (19%) by using ATM machines. Respondents have shown a lesser interest in paying utility bills through digital banking (10%) and performing online purchasing transactions (10%) due to security concerns and non-real time updates. The participants using digital access for account opening and loan processing is comparatively below average and it's just 3%. For account opening and to process a loan still customers are visiting the

branches. These results indicate that even the people who are using virtual banking are not familiar to perform all the available services and they only carry out the routine transactions.

Table 5: Mostly carryout virtual banking services

Virtual banking services	Frequency	Percent
Balance inquiry	79	20.0
Transaction history	70	18.0
Fund transfer	77	20.0
Utility bill payment	38	10.0
Online purchasing	39	10.0
Cash withdrawal	75	19.0
Account opening and loan processing	12	3.0
Total	**390**	**100.0**

Source: Survey Data, 2019

4.2.4. Descriptive Analysis of Research information

Table 6 shows that the highest mean value extracted for each service quality dimension and customer satisfaction dimensions indicate that overall virtual banking service quality is highly perceived by the customers in Trincomalee district and they are fairly satisfied with the usage of virtual banking. Banks have to concentrate more on system development since the mean value is in a moderate level.

Table 6: Descriptive Analysis of Research information

Virtual Banking Service quality	Mean	Std. Deviation	Customer Satisfaction	Mean	Std. Deviation
Efficiency	3.63	0.63	Content	3.83	0.86
System Availability	3.34	0.73	Accuracy	3.79	0.74
Fulfilment	3.50	0.67	Ease of use	4.00	0.72
Privacy	3.67	0.76	Timeliness	3.78	0.78
Responsiveness	3.59	0.69	Safety	3.72	0.75
Compensation	3.78	0.71			

Source: Survey data, 2019

4.3. OLS Assumptions: Multi-collinearity Test

The multi collinearity issue was checked between the independent variables and the dependent variable of customer satisfaction as shown in Table 6 and found the VIF value of less than 0.5 and the tolerance value which is higher than 0.2 indicate there is no severe multicollinearity problem among the variables (Table 7)**.**

Table 7: Multi-collinearity test

	Collinearity Statistics	
	Tolerance	**VIF**
Efficiency		
System Availability	0.338	2.963
Fulfilment	0.614	1.628
Privacy	0.363	2.756
Compensation	0.410	2.440
Responsiveness	0.955	1.047
	0.428	2.336

a. Dependent Variable: Customer satisfaction

Source: Survey data, 2019

4.4. Correlation Analysis

According to Table 8, efficiency is positively correlated with customer satisfaction in virtual banking (r=0.508) at the level of 0.01. Relationship between System availability and customer satisfaction in virtual banking is a weak positive as Pearson correlation value is less than 0.5 (r=0.377) at the 5% significance level. Fulfilment has a significant relationship with customer satisfaction in virtual banking at the significant level of 0.01. The Pearson correlation value 0.537 is higher than 0.5 depicting that a significant moderate positive linear relationship between fulfilment and customer satisfaction in virtual banking. The correlation between privacy and customer satisfaction reported as 0.579, ($r>0.5$) and the significance value $p<0.05$ are expressing a positive significant linear correlation between privacy and customer satisfaction in virtual banking. The correlation analysis for responsiveness and customer satisfaction in virtual banking portrays a weak positive relationship where the Pearson correlation is 0.493 which is less than 0.5 and significance value is below 0.05. The correlation between compensation and customer satisfaction on virtual banking is lower than 0.5 (r=0.068) which is illustrating a weak positive relationship whereas the significance level is 0.179 which is higher than 0.05 ($0.179=P>0.05$) represents that it cannot be generalized. The overall predictability of the correlation between virtual banking service quality and the level of customer satisfaction is depicting that 0.6, which is a moderate positive significant linear relationship at 5% significant level in Trincomalee district.

Table 8: Correlation Analysis between Virtual Banking and Customer Satisfaction

Independent Variables	Customer satisfaction (N=390)	
	Pearson Correlation	Sig. (2-tailed)
Efficiency	0.508**	0.000
System Availability	0.377**	0.000
Fulfilment	0.537**	0.000
Privacy	0.579**	0.000
Responsiveness	0.493**	0.000
Compensation	0.068	0.179
Overall Virtual Banking Service Quality	0.600**	0.000

**Correlation is significant at the 0.01 level (2-tailed).

Source: Survey data, 2019

4.5. Regression Analysis

As per the Table 9, simple regression is shown from Model 1 to Model 6. Except compensation, all other dimensions positively influence customer satisfaction. According to the result of multiple regression model 7 in Table 9, the 'F 'value of 41.708 conveys that data used in the model is best fit to explore the influence of virtual banking service quality on customer satisfaction as the significance value is 0.000.

The value of R square is 0.395 explaining that based on the selected sample of the survey, 39.5% variation of dependent variables of customer satisfaction in virtual banking can be explained by the independent variable of virtual banking service quality. Adjusted R square 0.386 conveys the independent variables of digital banking service qualities that explain 38.6% of the dependent variable of customer satisfaction in virtual banking of Commercial Banks in Trincomalee district. It proves that more than the virtual banking service qualities tested in this research, some other dimensions are also influencing customer satisfaction in respect of virtual banking in Trincomalee district. It also illustrates how far the virtual banking service quality dimensions of efficiency, system availability, fulfilment, privacy, responsiveness and compensation are having influence on the level of customer satisfaction.

The significant value is below 0.05 for privacy, responsiveness and fulfilment indicate a significant positive impact on customer satisfaction on virtual banking. Out of these three variables privacy highly influences on customer satisfaction of virtual banking services. Next, Responsiveness is also having a

high impact on customer satisfaction. Other three virtual banking service quality dimensions namely efficiency, system availability and compensation are having the significant value above 0.05 reveals that these variables do not have a significant impact on customer satisfaction.

Table 9: Regression Analysis

Independent Variables	Dependent Variable - Customer Satisfaction						
	Separate Regression						Multiple Regression
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
B	2.534 0.000 [0.112]	3.064 0.000 [0.097]	2.581 0.000 [0.101]	2.597 0.000 [0.089]	2.702 0.000 [0.102]	3.663 0.000 [0.121]	2.045 0.000 [0.143]
Efficiency	0.355* 0.000 [0.031]						0.055 0.251 [0.048]
System Availability		0.227* 0.000 [0.028]					0.017 0.586 [0.031]
Fulfilment			0.350* 0.000 [0.028]				0.087* 0.047 [0.043]
Privacy				0.334* 0.000 [0.024]			0.202* 0.000 [0.036]
Responsiveness					0.312* 0.000 [0.028]		0.093* 0.016 [0.039]
Compensation						0.042 0.179 [0.031]	0.045 0.075 [0.025]
F	135.248	64.215	156.833	196.017	124.445	1.810	41.708
Sig.	(0.000)	(0.000)	(0.00)	(0.000)	(0.000)	(0.179)	(0.000)
R	0.508	0.377	0.537	0.579	0.496	0.068	0.629
R Square	0.258	0.142	0.288	0.336	0.243	0.005	0.395
Adjusted R Square	0.257	0.140	6	0.334	0.241	0.02	0.386

P- values are shown in parentheses and standard errors are reported in square brackets

Source: Survey data, 2019

In respect of the above results, the regression equation could be written as follows.

CS = 2.045 + 0.055E + 0.017SA + 0.087F + 0.202P + 0.045C + 0.093R + e

Where,

CS	-	Customer Satisfaction on virtual Banking
E	-	Efficiency
SA	-	System Availability
F	-	Fulfilment
P	-	Privacy
C	-	Compensation
R	-	Responsiveness
e	-	Error term

The equation indicates that the constant static 2.045 units show that the model can predict when all the independent variables were zero. When Fulfilment increases by one unit, customer satisfaction will be increased by 0.087 units as average. When Privacy increases by one unit, customer satisfaction will be raised by 0.202 units as average. Similarly, other dimensions could be explained.

4.6. Hypothesis Test

H1: There is a significant positive relationship between efficiency and customer satisfaction in virtual banking.

The multiple regression analysis portrays the significance value as 0.251 (0.251>0.05, (p<0.05) indicating there is no positive significance relationship between efficiency and customer satisfaction on virtual banking. However, Pearson's correlation analysis coefficient is 0.508 which is significant at the level of 5% (p=0.000) illustrates a positive significant relationship between efficiency and customer satisfaction. Therefore, accepts the hypothesis H1 as per the correlation result.

H2: There is a significant positive relationship between system availability and customer satisfaction in virtual banking.

The multiple regression analysis portrays the significance value as 0.586 (0.586>0.05, (p<0.05) indicating there is no positive significance impact of system availability on customer satisfaction pertaining to virtual banking. However, Pearson's correlation analysis, the coefficient is 0.377 which is significant at the level of 5% (p=0.000) illustrates a positive significant relationship between system availability and customer satisfaction. Thus, as per the correlation result hypothesis H2 has been accepted.

H3: There is a significant positive relationship between fulfilment and customer satisfaction in virtual banking.

As per Pearson's correlation analysis the coefficient is 0.537 which is significant at the level of 5% (p=0.000) illustrates a positive significant relationship between fulfilment and customer satisfaction. According to multiple regression analysis the significance value is 0.047 which is less than 0.05 is also indicating a significance impact of service quality dimension of fulfilment on the two variables. Therefore, accepts the hypothesis H3.

H4: There is a significant positive relationship between privacy and customer satisfaction in virtual banking.

As per Pearson's correlation analysis the coefficient is 0.579 which is significant at the level of 5% (p=0.000) illustrates a positive significant relationship between privacy and customer satisfaction. Based on the results of multiple regression analysis the significance value is 0.000 which is less than 0.05 also indicating a significance relationship between the two variables. Therefore, accepts the hypothesis H4.

H5: There is a significant positive relationship between responsiveness and customer satisfaction in virtual banking.

According to Pearson's correlation analysis the coefficient is 0.493 which is significant at the level of 5% (p=0.000) illustrates a positive significant relationship between responsiveness and customer satisfaction. Based on the results of multiple regression analysis the significance value is 0.016 which is less than 0.05 also indicating a significance relationship between the two variables. Therefore, accepts the hypothesis H5.

H6: There is a significant positive relationship between compensation and customer satisfaction in virtual banking

As per the Pearson's correlation analysis the coefficient is 0.068 which is not significant (p=0.179>0.05) illustrates there is no relationship between compensation and customer satisfaction. The multiple regression analysis also portrays the significance value as 0.075 (0.075>0.05, (p<0.05) indicating there is no positive significance impact on compensation and customer satisfaction on virtual banking. Therefore, hypothesis H6 has been rejected.

5. DISCUSSION

Statistical analysis proved that virtual banking service quality has influenced customer satisfaction in Trincomalee district. The previous studies (Sharma & Malviya, 2014; Toor et al., 2016; Kaura et al., 2015) also have proved the same. In addition, it has been noticed that each and every service quality dimension identified in this research has a positive significant relationship

with customer satisfaction except compensation. Out of the six service quality dimensions privacy, fulfilment and responsiveness are highly significant with customer satisfaction. Efficiency and system availability have proved less significant relationship. However, compensation has not produced a significant relationship with customer satisfaction of commercial banks in Trincomalee district. Compared to the other dimensions, privacy is statistically more significant and has a greatest positive relationship with virtual banking customer satisfaction. Responsiveness has a significant positive relationship with customer satisfaction. Previous studies (Sakhaei et al., 2014; Zeithaml et al., 2002; Nupur, 2010; Toor et al., 2016) also pointed out that responsiveness has an influence on customer satisfaction. Statistical results of fulfilment also have a major influence on customer satisfaction on virtual banking. The bank's ability to deliver right services consistency on right time with data accuracy to fulfil the customer's expectation is known as fulfilment. Findings in previous researches (Toor et al., 2016; Nupur, 2010; Akinci et al., 2010) are consistent with the present study.

Efficiency, system availability and compensation have not proved significant influence on customer satisfaction in Trincomalee district in the multiple regression. However, previous studies summarized that there was a significant linear relationship between the two variables (Herington & Weaven, 2009; Zethaml et al., 2002). Ling et al. (2015) and Zeithaml et al. (2002) found that system availability has a significant effect on customer satisfaction in virtual banking whereas the current study reveals that system availability has less significance with customer satisfaction in virtual banking in Trincomalee district.

Further, Prior researches (Parasuraman et al., 2005; Tharanikaran et al., 2017) illustrated that compensation is also having a positive impact on customer satisfaction. In contrast, the current study conducted in Trincomalee concluded that there is no significant relationship between compensation and virtual banking customer satisfaction.

6. CONCLUSIONS

The study found that ATM, Internet banking and Mobile banking are highly accepted by the customers in Trincomalee district and most of them are utilizing the routine transactions rather than performing all types of virtual transactions. Conclusion for each objective is subsequently presented.

First objective is to identify the level of virtual banking service quality of commercial banks in Trincomalee district. The state of virtual banking service quality measured through the e- service quality dimension of efficiency, system availability, fulfilment. Privacy, responsiveness and compensation and

several indicators were identified under each dimension to analyse the level of service quality. The highest mean value arrived for compensation and continuously privacy, efficiency, responsiveness, fulfilment are in line with higher mean. However, the mean value extracted for system availability is in a moderate level. Results indicate that overall virtual banking service quality is higher in relation to customer's perception.

Second objective is to identify the level of customer satisfaction of virtual banking of commercial banks in Trincomalee district. In order to identify the customer satisfaction level selected sample were asked questions based on the customer satisfaction dimension of content, ease of use, accuracy, timeliness and safety. The mean and standard deviation calculated for each dimension through descriptive analysis illustrates that all five variables are having a high mean value and explains that the customers of commercial banks in Trincomalee district are satisfied with the usage of virtual banking. Ease of use has a highest mean and influencing higher on customer satisfaction with the rest of the four dimensions.

Third objective is to examine how virtual banking service quality influence the customer satisfaction of commercial banks in Trincomalee district. It is concluded that there is a significant relationship between virtual banking service qualities and customer satisfaction of commercial banks in Trincomalee district. Privacy, fulfilment and responsiveness are influenced on customer satisfaction whereas efficiency, system availability and compensation are not significantly influenced on customer satisfaction and compensation is not reflected in a valuable relationship with customer satisfaction in Trincomalee. Moreover, it can be concluded that customers of Trincomalee perceive the virtual banking service quality mostly by privacy, fulfilment and responsiveness. Privacy is the most significant factor perceived by customers to concentrate more on customer satisfaction in virtual banking. Therefore, the study is conveying that better service quality improvements enhance better customer satisfaction.

7. POLICY IMPLICATION

Findings help the banks to identify the real perception of virtual banking by customers and identify the factors by which banks can improve virtual banking service quality which has a huge influence on the customer satisfaction as well as reduces the operational cost and consequently increase the profitability of banks. In addition, it is useful to find out the reasons in customers' perspective why the entire market is still reluctant to move towards electronic channels. Findings of the study provide better solutions to the management of banks how more customers could be attracted while it

provides valuable information to policy makers to design virtual financial systems.

8. DIRECTION TO FUTURE RESEARCH

The study was conducted to identify the customer satisfaction based on virtual banking service quality through customer's perception only in Trincomalee. Therefore, future research is needed to extend the Eastern province as well as the whole country to identify the actual trend of virtual banking service quality and customer satisfaction for better understanding. Secondly, another study could be conducted on the impact of virtual banking on financial performance of banks. Thirdly, qualitative study also could be undertaken to gain more insight of customers pertaining to virtual banking.

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POTENTIAL FOR COMMERCIALIZATION OF APICULTURE AS A BIOFIN LIVELIHOOD OPTION IN ANURADHAPURA DISTRICT, SRI LANKA

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ABSTRACT

Apiculture is the scientific management of honeybees, which provides an environmentally friendly livelihood option. The honeybees play a key role in the ecosystems by supporting to pollination and food production. However, modern agricultural practices have threatened the survival of honeybees. Therefore, conservation, rearing, and management have been taken due attention. The study was carried out to assess the suitability of apiculture as a (Biodiversity Finance –BIOFIN) livelihood option and to design a value chain for the community in the *Anuradhapura* district. The study used a randomly selected sample of 130 respondents representing 50 beekeepers from *Bandarawela* to study the existing bee honey value chain, 50 fruit or vegetable farmers in *Palugaswewa*, and 30 value chain actors for the analysis. The data collection was done using a pretested structured questionnaire. Binary logistic regression was used to identify the factors affecting farmers' willingness for apiculture. Further, SWOT analysis and value chain analysis were conducted. The regression results revealed that land size (p=0.015), and credit access (p=0.041) have positive impacts, while gender (p=0.012), has a negative impact on farmers' willingness at 5% significance level. According to the SWOT analysis, land availability and the obtainability of bee colonies are the

strengths. Among the weaknesses, the need for specific skills and low access to inputs like beehives have been identified. Moreover, the demand for dry zone bee honey was identified as an opportunity while deforestation and over-application of pesticides were identified as threats. The study finds that beekeeper – processor – local consumers are the stakeholders of the market chain for bee honey. The processors obtain the highest gross margin and market margin. Results conclude that apiculture can be used as a BIOFIN livelihood option by providing sufficient knowledge and training, developing an input supply system, introducing value addition, and marketing linkages.

Keywords: Apiculture, Bee honey, BIOFIN, Farmers' willingness, Value chain

1. INTRODUCTION

Apiculture is defined as, rearing of honeybees in a broader sense (Punchihewa, 1994). It is the way of managing and caring of honey bees in a scientific way (Sharma and Das, 2018). Bee honey, pollen, propolis, bee wax, royal jelly, bee venom, the queen, and the beehives are the major products of apiculture (Sforcin *et al*., 2017; Sharma and Das, 2018; Vapa- *et al*., 2020).

Sri Lankan context, there is a demand for natural bee honey in Ayurveda medicine, the beauty culture industry, and the food industry. Therefore, annually around 60 to 80 metric tons of bee honey is imported to Sri Lanka from Australia, India, China, and Thailand where annual local production is around 20 metric tons at present (Thambavita, 2019). Natural raw honey, value-added products like garlic with honey, cinnamon with honey, and bee balm are commonly available products in Sri Lankan supermarkets. But, only bottled natural raw honey is available in Sri Lankan retail and wholesale shops.

Apiculture is an important component in agriculture, rural employment, human nutrition, and economic development (Aiyeloja *et al*., 2015; Fels *et al*., 2019; Gratzer *et al.*, 2019). For instance, apiculture can be used as a solution for youth and women unemployment in the rural sector since apiculture can be practiced by anyone irrespective of sex and age. Furthermore, apiculture can be used as an employment opportunity for disabled people, because it does not require heavy works (An, 2015). Moreover, apiculture helps to generate employment opportunities such as the manufacturing of equipment and materials, especially the bee boxes needed for the creation of the apiary, smokers, honey extractors, selling bee colonies, and value addition (Tej *et al.*,

2017). Since Sri Lanka is one of the great tourist hotspots; apiculture can be linked with the tourism industry (Wos, 2014; Belma, 2020).

As pollinators, honey bees play a significant role in biodiversity and food production. They provide sustainable benefits to humans through pollination, helping plants grow, and producing foods. Therefore, it concludes as Honey bees are the world's most important single species of pollinators in natural ecosystems. It is estimated that one-third of food that we consume each day relies on pollination mainly by bees (FAO, 2018).

However, deforestation, crop monoculture, bee-killing pesticides, Genetically Modified Crops (GMC), climate change, and parasites are the major reasons for the decline of honeybees. On the other hand, pests i.e. wax moth, diseases i.e. American foulbrood disease, European foulbrood disease, and Chalkbrood disease are the major threats for commercialization of apiculture (Bradbear, 1988; Aronstein and Murray, 2010). The honey bee decline is directly linked with biodiversity degradation. Thus, conservation of natural honey bee population and propagation of honey bees become a timely important matter. In this regard, the promotion of apiculture and commercialization are important to conserve the natural honey bee population (Goulson *et al.*, 2015).

As a conservation strategy, the Biodiversity Finance Initiative (BIOFIN) would be a viable option to build a link between beekeeping which has an impact on biodiversity conservation and livelihood development. BIOFIN is a UNDP-managed global partnership that supports countries to enhance their financial management for biodiversity and ecosystem conservation. In the year 2012 UNDP and the European Commission launched the BIOFIN (UNDP, 2018).

Premarathne *et al.*, (2018) have proposed a model that considers economic, environmental, and social sustainability with apiculture under BIOFIN. The study highlighted the potential for promoting apiculture as a BIOFIN livelihood option by considering the country specific factors that collect through the literature. According to the suggested model, credit facilities will be offered to functioning farmer organizations (FOs). Then FOs will dissolve funds further to invest on apiculture with their members as small groups. At the end, small groups will repay the loans to the corresponding FO and ultimately FO will pay the initial loan to the respective bank. After the successful adaptation of the suggested model, it expects to protect the ecosystems while expanding biodiversity. Income gains for farmers through bee honey production and high crop yields due to enhanced crop pollination are expected through the proposed model. But the suggested model has not yet been tested for the suitability at the farmer level. The research team have recommended assessing the suitability of the model at desired areas before

implementing in their publication. Therefore, this study aimed to examine the potential for apiculture as a BIOFIN livelihood option model as suggested and the potential to establish it as a sustainable value chain.

Value chain approach is highly used in the promotion of agricultural commodities in the world (Miller and Jones, 2010; Trienekens, 2011) In this regard, National Agribusiness Development Program (NADeP) and International Fund for Agriculture Development (IFAD) have proposed a value chain by introducing Producer-Public-Private Partnership (P4) project together with one of the private sector business organization in Sri Lanka in the Uva Province for the promotion of bee honey production. There are around 600 beneficiaries, and this is the biggest honey production development project launched in Sri Lanka at present (Kumara and Prasad, 2019). Therefore, the study was carried out to find out the ways of promoting apiculture in the *Anuradhapura* district by considering the value of such initiation.

Moreover, there are a limited number of studies that have been done on both bee honey value chain and apiculture in Sri Lanka.in this background, the study focused to fill the information gap to develop a bee honey value chain and the apiculture as a BIOFIN livelihood option.

2. REVIEW OF LITERATURE

2.1. Honey bee species in Sri Lanka

Honey bees are social insects that live in colonies. Sri Lanka is home to nearly 150 species of bees and four of these species produce their own honey. They are *Apis cerana* (Asian hive honeybee), *Apis dorsata* (Giant honey bee), *Apis florea* (Dwarf honey bee), *Trigona iridipennis* (Stingless honeybee). They are called 'True Honey bees' in Sri Lanka (Karunaratne, 2004).

A. cerana is generally distributed in tropical, subtropical and temperate areas of Asia. *A. dorsata* can be found in Pakistan, through the Indian subcontinent and Sri Lanka. *A. florea* is distributed in warm areas like Pakistan, Iran, Oman, India, and Sri Lanka (Yadav *et al.*, 2017).

2.2. Apis cerana

A. cerana is Sri Lanka's indigenous species and they are commonly used in honey production because of their relatively non-aggressive nature (Jayathilaka and Mudaliyar, 1881: Punchihewa, 1994). In some parts of China and India, *A.cerana* honey is considered to be superior quality than that of *A. mellifera* (Abrol, 2013). Generally, they are called as 'Indian honeybee'

or 'Asian hive honey bee'. *A. cerana* belongs to order Hymenoptera and family Apidae. It is similar to the European honeybee: *A. mellifera*. *A. cerana* usually build their multiple combed nests in tree hollows and man-made structures.

A bee colony consists of one queen, thousands of workers, and few drones (Punchihewa, 1994; Devillers, 2002). *A. cerana* colonies consist of approximately 34,000 bees (Egelie *et al.,* 2015). Queen is the reproductive female of the colony and she has a large body with wings that covers only about two-thirds of the abdomen. She does not have structures to collect pollen or functional wax glands. The main function of the queen is to lay eggs and keep the workers uninterested in reproduction through pheromonal control. The drones are the largest bees in the colony. They do not have a sting, pollen baskets or wax glands. They are produced to mate with the queen. The workers are the smallest and the most numerous individuals in the colony. They are sexually underdeveloped females. Worker bees have specialized structures such as; brood food glands, scent glands, wax glands, and pollen baskets. They perform all hive maintenance like cleaning, foraging, tending to the brood (eggs, larvae, and pupae), and producing honey (Devillers, 2002; Egelie *et al*., 2015). Within the colony worker bees rear new queens for some reason as; the former queen left with a swarm, the queen is laying increasingly fewer eggs and the colony is overcrowded and has no space to expand. *A. cerana* has a longer daily foraging period than *A. mellifera.* Also, *A. cerana* can forage at lower temperatures (Egelie *et al.,* 2015).

2.3 Importance of honeybees

As stated by Albert Einstein, “If bees disappeared off the face of the earth, man would only have four years left to live”. It means the honey bee plays an important role in the ecosystem. In many crops, insect pollination is essential for seed production. Among the insect pollinators, bees are the most important pollinator because of their foraging behavior and constancy (Corbet and Osborne, 1991).

The majority of horticultural crops including fruits, vegetables, spices, and plantation crops depend on different kinds of insect pollinators. Absent of insect pollinators lead a 70-90 percent fruit set ranging reduction in different mango varieties. Similarly, for onion and watermelon, native honey bee species called, *A. cerana, A. dorsata,* and *A. florea* are the major pollinators (Reddy *et al.,* 2019).

2.5 Reasons for honey bee drop

Invasive species, habitat loss, climate changes, and insecticides are the major drivers of honeybee decline (Meeus *et al.,* 2018).

Pesticide-contaminated flowers affect the health of the honeybee colonies and decline their productivity (Krupke and Long, 2015). Exposure of honeybees to a sub-lethal dose of neurotoxic insecticides can cause stress, paralysis, or abnormal behavior but not kill the honeybees (Zaluski *et al.,* 2015). Neonicotinoids reduce the mating frequency of the queen and it negatively affects the genetic diversity in the colony (Nadege *et al.,* 2017). According to Williams *et al.,* (2015), contamination of neonicotinoid pesticides during colony development stage can severely affect queens.

Unfavorable weather conditions and habitat degradation which resulted due to deforestation are adversely effect on honeybees (Mustafa *et al.,* 2015). Habitat loss reduces the abundance and diversity of floral resources and nesting opportunities (Goulson *et al.,* 2015). Monoculture also leads to habitat degradation and ruin floral resources for honeybees (Nicholls and Altieri, 2013). Annual fires in some areas are considered a serious threat to honeybees and bee honey production because fire reduces the availability of floral resources. Also, during the dry season, Bush burning considerably reduces the wild bee population (Mustafa, 2015).

Pests and diseases are another major threat to honey bee drop. The wax moth is the major problem to beekeeping in Asia. Wax moth occurs because of poor management practices by the beekeeper. *Galleria mellonella* (Greater wax moth) and *Achroia grisella* (Lesser wax moth) are the major damaging wax moth species found in India. Maintaining good hygienic beekeeping practices can prevent a wax moth attack. Hive Beetle (*Aethina tumida*), ants and wasps, birds, and Indian Bear (*Melursus ursinus*) are the other minor pests of honeybees in India (Nirupama, 2018).

American foulbrood (AFB) disease, European foulbrood (EFB) disease are the dangerous bacterial diseases infecting honey bee colonies (Bradbear, 1988; Kishan *et al*., 2017). Chalkbrood is a fungal disease of honey bee brood caused by *Ascosphaera apis.* Supplemental feeding to improve the nutritional and health status of honey bees, keeping hives clean and well ventilated, using clean equipment, and avoiding transfer of combs between colonies are the possible management and sanitation strategies to control the Chalkbrood disease (Aronstein and Murray, 2010).

European foulbrood (EFB) disease is caused by the Gram-positive bacterium *Melissocccus plutonius* (Forsgren, 2009). EFB affects honey bee larvae. Adult

worker bees act as carriers of the bacterium within the colony, between colonies and apiaries (Belloy *et al.*, 2007; Mckee *et al.*, 2003). In many countries, Oxytetracycline hydrochloride (OTC) is used as a bacteriostatic antibiotic to inhibit the multiplication of the causal organism (Thompson and Brown, 2001).

2.5 Apiculture

Apiculture contains the management and scientific background for the management of honey bees. Rearing of bees is done for honey production or wax production or crop pollination (Punchihewa, 1994). According to FAO, (2009), there are the ten excellent reasons for engaging in apiculture such as pollination process, production of bee honey, bee wax like products, required few resources only, no need of land ownership, no competition with other livestock or crops for pollen and nectar, having benefits to different sectors and trades from a strong beekeeping industry, apiculture encourages ecological awareness, everybody can be a beekeeper and apiculture is being environmentally friendly.

According to Chanthayod *et al.*, 2017 have resulted that all beekeepers being male (98%) and beekeeping families had a marginally higher net income from honey production than non-beekeepers. Family size, number of labors, education level, and beekeeping experience affects honey income generation. Beekeepers have more conservation-minded attitudes and they tend to be more environmentally friendly. Lack of technology for apiculture, lack of bee honey market information is the main constraints in apiculture.

Rock bee (*Apis dorsata*), little bee (*Apis florea*), Indian bee (*Apis cerana*), European bee (*Apis mellifera ligutica*), and stingless bee are the honey bee species in India. During the honey flow season, honeybees have to be managed by providing more space for honey storage, dividing strong colonies into two or three new ones, and building a sufficient population prior to honey flow by providing sugar syrup. Management methods such as providing sufficient shade conditions, sprinkling water on gunny bags or rice straw put on the hive to increase RH and reduce the heat, providing sugar syrup, pollen supplements or substitutes, and water should be needed during the severe summer season (Kishan *et al.*, 2017).

2.6 Bee honey value chain

The concept of the value chain was introduced by Porter in 1985 (Zamora, 2016). The value chain represents a series of activities that an organization performs to deliver a valuable product for the market (Simatupang *et al.*,

2017). When a product or a service moves from one actor in the chain to another, it is assumed to gain value (Hellin and Meijer, 2006; Zamora, 2016).

The value chain is defined by Kaplinsky as "the full range of activities which are required to bring a product or service from conception, through the intermediary phases of production, delivery to the final consumer, and final disposal after use" (Kaplinsky and Morris, 2001). In Porter's value chain; there are two categories of business activities, "primary" and "support". Primary activities consist of five components, and all are essential for adding value to the product or service. Inbound logistics, operations, outbound logistics, marketing and sales, and services are the "primary activities". Support activities help to make the primary activities more efficient. Procurement, technological development, human resources management, and infrastructure are the "support activities" in the value chain (Porter, 2001).

In 2011, Shackleton *et al.,* revealed that honey and honey products are sold at different stages of the value chain through both formal and informal channels in Zambia. In isolated, traditional honey production areas, honey is directly sold to buyers. In less isolated areas producers or intermediaries travel to the market. Women actively participate in honey marketing and sales. Formal companies and traders buy honey from individuals or groups.

The value chain actors who manage a particular product through the value chain include, input supplier, producer, processor, wholesaler, retailer and final consumer (Hellin and Meijer, 2006). “The wholesaler is one who buys goods on a large scale with the objective of selling them at a profit in smaller quantities.” (Carrad and Oliphant, 1970). Retailers typically buy goods from a manufacturer, wholesaler, or other distributor and then resell them to the consumer (Hudson, 2020). Retailing consists of all the activities of selling goods or services directly to the final consumer (Kotler and Armstrong, 2012).

3. METHODOLOGY

3.1. Study Area

Anuradhapura district was purposely selected for the study since there is a high demand for bee honey, produced in dry zone areas due to its unique flavour. *Palugaswewa* Agrarian Service Division (ASD) (8°19′0″N, 80°35′0″E) was purposely selected to test the suitability of the proposed model because there are numerous fruit and vegetable growing farmers. *Bandarawela* DS division (6°50′13″N, 80°59′8″E) was purposively selected as the bee honey producing area under Smallholder Agribusiness Partnership Program (SAPP) to study the existing bee honey value chain to identify the

facts related to the successful establishment of a new bee value chain in *Anuradhapura.*

3.2. Sample Size

A total of 130 samples were selected by using a simple random sampling method. 50 beekeepers from the *Banadarawela* DS division and 50 fruit or vegetable growing farmers in the *Palugaswewa* ASD area were selected. 10 respondents from each actor in the value chain were used (i.e. processor, retailers, and consumers).

3.3. Data Collection

Primary data were collected using a pretested structured questionnaire.

3.4. Data Analysis

The binary Logistic Regression model was proposed (Schulz *et al.*, 2014) to identify the factors affecting farmers' willingness on apiculture.

$$\textbf{Log [Y]} = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} X_{10} + \varepsilon$$

Where the dependent variable is the willingness to do apiculture with considering the phobia to bee stings (binary). There are nine independent variables as; age, gender, level of education, awareness about beekeeping and technology, land size, information access on apiculture, credit access for apiculture, starting capital for apiculture and farmers' income (Mujuni *et al.*, 2012; Ahikiriza, 2016).

Almost all the responders in *Palugaswewa* were willing to do apiculture. But people with apiphobia would be unsuccessful in apiculture. A phobia is a "type of anxiety disorder defined by a persistent and excessive fear of an object or situation" (American Psychiatric Association, 2013). Melissophobia or apiphobia is the fear of bees. Thus, apiculture cannot be practiced by people with the phobia for bee stings. Therefore, true willingness is considered as the dependent variable where people who do not have the phobia for bee stings.

A SWOT Analysis was conducted to see the applicability of the suggested model by Premarathne *et al.*, 2018.

The Gross Margin and Market Margin analysis techniques were used to determine the profit gained by different actors in the bee honey value using 10 respondents from each actor in the value chain.

Gross Margin (GM)

Gross margin (GM) is defined as the difference between total revenue and total variable costs (Lazaro, 2008).

$$GM = \sum TR - \sum TVC = \sum PyY - \sum PxX \quad \ldots\ldots\ldots\ldots (1)$$

Where GM = Gross margin per 30ml of bee honey bottle
$\sum TR$ = Total revenue from sales of one 30ml bee honey bottle
$\sum TVC$ = Total variable cost spent on producing / selling of one 30ml bee honey bottle
Py = Price of honey per one 30ml bee honey bottle
Px = Price of input used in producing one 30ml bee honey bottle
Y and X are the quantities of honey produced and inputs used respectively.

Market Margin (MM)

The marketing margin (MM) is the percentage of the final weighted average selling price taken by each stage of the marketing chain (Tomek and Robinson, 1991).

$$MM = WSp - WBp / WSp * 100 \quad \ldots\ldots\ldots\ldots (2)$$

Where MM = Market Margin
WSp = Selling price
WBp = buying price

4. RESULTS AND DISCUSSION

4.1. Socio-economic profiles of beekeepers in *Bandarawela*

The results were based on the responses of 50 beekeepers in *Bandarawela.* The majority of the beekeepers were male (78%) and 60% of the beekeepers were above 50 years of age. Regarding the educational background 66% had attended up to G.C.E. O/L. When considering the monthly income, 38% of the beekeepers received monthly income between 10,000 and 30,000. Beekeepers who received more than LKR 50,000 monthly income were either government employees or private-sector employees. The majority of the beekeepers (73%) cultivated upcountry vegetables other than beekeeping. The average land size owned by a beekeeper was 0.91ac.

Every beekeeper had more than 5 years of experience in beekeeping and 66% had experience of over 10 years. Previous experience was considered as a pre-requisite for joining the project.

More than 90% of the beekeepers mentioned that the environmental conditions such as rainfall and deforestation, current market price, market opportunities, and agro-chemicals were highly affecting for beekeeping.

Beekeeping contributes 22% to the annual income of a beekeeper. The beekeeper can receive an average of Rs. 16,000 annual income by maintaining only 2 bee honey colonies. Engage in beekeeping as a supplementary income ensures a considerable amount of monthly income. Even though bee honey harvesting is not practicing regularly, the beekeeper can store the products until it gets a fair price. Therefore, beekeepers can receive a year-round income by identifying the demand and supply of the product.

4.2. Socio-economic profiles of fruit and vegetable farmers in *Palugaswewa* ASD

The results were based on 50 fruit and vegetable growing farmers in *Palugaswewa* ASD. The majority of the beekeepers were male (70%) and 40% of the beekeepers were with the age range of 40-50. Regarding the educational background 72% had attended up to G.C.E. O/L. When considering the monthly income, 40% had monthly income between 10,000 and 30,000. The average land extent per farmer was 8.88ac.

From the studied sample 27 farmers liked apiculture as a supplementary income source (54%) and 23 farmers did not like it. Difficult in finding inputs like bee boxes, not having sufficient knowledge on hive management, phobia to bee stings, and unable to afford starting capital for beekeeping themselves were the mentioned reasons for not like apiculture as a supplementary income source.

Based on the survey, 43farmers (86%) said that they have information access on apiculture through agricultural instructors. Remaining 7 farmers (14%) said they do not have access to information and their most preferable information source was via organizations. Regarding their knowledge about beekeeping, 30 farmers (60%) said, they have sufficient knowledge about beekeeping. When considering the capital access, 23 farmers (46%) said that they can afford the capital for beekeeping by themselves and 27 (54%) farmers said that they like to apply for a loan to access the credit. Among those 27, 21 farmers preferred to get a loan through government banks and 6 preferred through farmer organizations.

4.3. SWOT Analysis

Premarathne *et al,* (2018) have conducted the SWOT analysis by using the available literature and suggested the BIOFIN model for farmer level. However, a SWOT Analysis was conducted for *Palugaswewa* Agrarian Service Division (ASD) using the data gathered through the structured questionnaire to examine the validity of the previous study. The results revealed that,

Strengths

1. There are enough land resources around the study area (Average land size per person – 8.88ac)
2. There are enough pollen and flower nectar for honey bees – 52%
3. Availability of bee attractive plants – 64%
4. Most farmers have basic knowledge and experience about beekeeping – 60%
5. Easy to find bee colonies – 90%

Weaknesses

1. Lack of specific skills for the establishment and maintenance of honeybee colonies – 40%
2. Lack of technical guidance – 80%
3. Low access to specific equipment such as bee boxes, smoker, honey extractor and Hazmat suit – 84%
4. Low interesting among women – 10%
5. Most farmers unable to afford the capital – 46%

Opportunities

1. Good growing demand for dry zone bee honey in both local and export market
2. Can link beekeeping with the tourism industry (Wos, 2014; Pelaez,2019; Belma, 2020)

Threats

1. Deforestation - 76%
2. Pest and disease incidence – 58%
3. Impact of climate change – 40%
4. Over-application of pesticides – 68%

4.4. Factors affecting farmers' willingness for apiculture in the *Anuradhapura* district

Table 1: Model Estimate

Variables	**Parameter Estimates (β)**	**p> |z|**
Land size	3.085233	**0.015*****
Gender		
0 Female	-2.963439	**0.012*****
1 Male	Reference group	-
Income		
1 (<10,000)	Refence group	-
2 (10,000-30,000)	2.71539	0.130
3 (30,000-50,000)	Omitted	-
4 (>50,000)	No observations	-
Level of education		
1 (No schooling)	Reference group	-
2 (Up to primary education)	No observations	-
3 (Up to GCE O/L)	-1.216946	0.522
4 (Up to GCE A/L)	-6.604474	**0.074****
Age		
1 (<30)	Reference group	-
2 (30-40)	-1.899204	0.458
3 (40-50)	-2.660987	0.418
4 (>50)	-7.091163	**0.089****
Awareness about beekeeping and technology	-1.392328	0.178
Information access on apiculture	2.632179	**0.067****
Starting capital for apiculture	-3.438321	0.159
Credit access for apiculture	2.688263	**0.041*****
Constant	-20.54968	0.017

(***Significant at 5%, ** Significant at 10%)

Source: Feld survey, 2020

According to binary logistic regression analysis, Land size, gender, and credit access for apiculture were statistically significant at 5%. Level of education, age, and information access on apiculture were significant at 10% with the dependent variable. Income, awareness about beekeeping and technology, and starting capital for apiculture were not statistically significant (Table 2). But Ahikiriza, 2016, and Mujuni *et al.*, 2012, revealed that age of the farmer, level of education, level of awareness about beekeeping and technology, information access on apiculture, and starting capital for apiculture were significantly affected for the farmers' willingness on apiculture.

As revealed by the results, gender (p=0.012) has a negative relationship with the willingness for apiculture. Compared to males, females are less likely to engage in apiculture. Being female decreases the willingness for apiculture. One possible reason for that could be the bee sting phobia. Research carried out by Kumwenda, 2016, also got the same results and the mentioned reason for that is female is not able to do apiculture without the help of men. Mburu *et al*., 2015 pointed out that most of the women do not carry out activities like hanging of beehives, beehives construction, and repair and bee honey harvesting. Lack of skills, bee sting phobia, and cultural constraints would be some of the reasons for not being interesting in beekeeping. In most African countries, beekeeping is predominantly a male activity (Shackleton, 2011). But in Pakistan, women are involved in beekeeping by feeding bee's supplements, extracting bee honey from combs, and packaging (Qaiser *et al.*, 2013).

Land size (p=0.015) has a positive relationship with the willingness for apiculture. It implies that, when the farmer has more land, his willingness for doing apiculture is increased. Research carried out by Kumwenda, 2016, also got the same results. When the farmer has more land to cultivate, this attracts more honey bee pollinators to his land. So, farmers can easily find honeybees required for doing apiculture. On the other hand, more honeybees around his cultivation mean his production will be higher. Those are the possible reasons for the increment of farmers' willingness on apiculture when the increase of land size. Credit access for apiculture (p=0.041) has a positive relationship with the willingness for apiculture. It means, when the farmers have access to the credit their willingness to do apiculture will be increased. In 2012, Mujuni *et al.,* got similar results.

The level of education (p=0.074) has a negative relationship with the willingness for apiculture. According to the results, when a person educates more the willingness to do apiculture is getting reduced. A possible reason would be educated people tend more to find non-farm activities rather than engage in agriculture-based activities as their occupation. The age of the farmer (p=0.089) has a negative relationship with the willingness for apiculture. Results imply that older farmers (>50 years of age) are less interested in apiculture. The result is also supported by earlier studies (Adgaba *et al*., 2014: Kalanzi *et al.,* 2015). Information access on apiculture (p=0.067) was found to be positively related to the willingness for apiculture. Mujuni *et al.,* 2012 also had got the same results and they mentioned, good extension services play a major role in the dissemination of information.

According to the results, the likelihood ratio chi-square of 23.06 with a p-value of 0.027 at a 5% significance level revealed that the whole model fits significantly than the empty model. Pseudo R2 values from 0.2-0.4 indicate

excellent model fit (McFadden, 1974). Therefore, the Pseudo R2: 0.3420 indicates the binary logistic model with gender, age, level of education, land size, information access on apiculture, and credit access as the independent variables are a very good model fit.

Table 2: Model Summary

LR chi2 (12)	23.06
Prob > chi2	0.0273
Pseudo R2	0.3420
Log-likelihood	-22.180985

Source: Author Constructed

4.5. Value Existing bee honey chain in *Anuradhapura* district

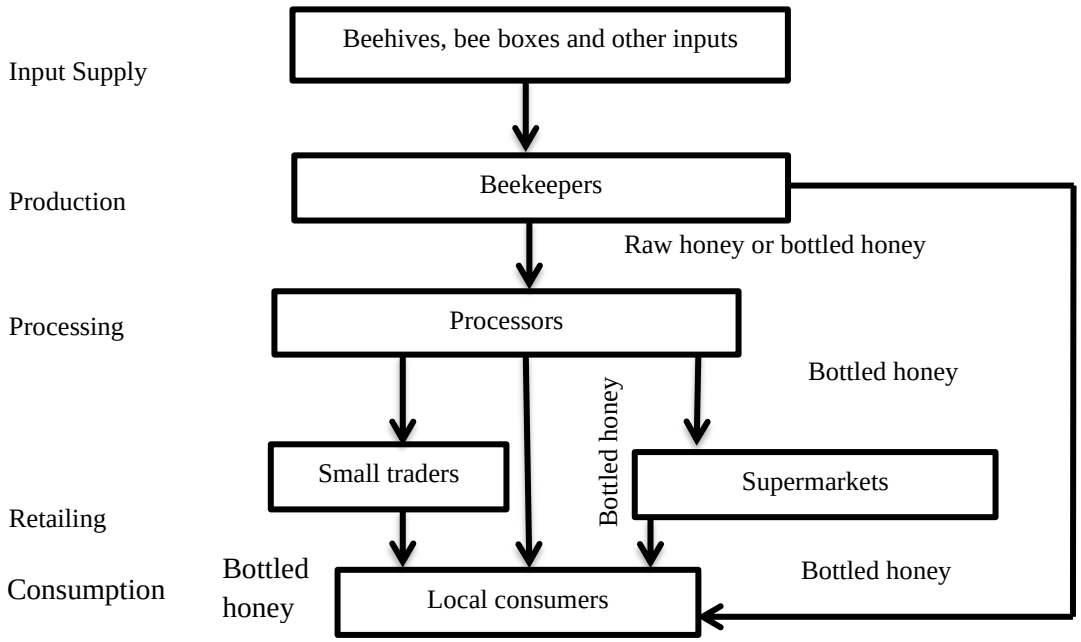

Figure 1: Existing bee honey value chain in *Anuradhapura* district

4.6. Bee honey marketing channels in *Anuradhapura* district

Beekeeper – local consumer
Beekeeper – processor – local consumer
Beekeeper – processor - small trader - local consumer
Beekeeper – processor - supermarket - local consumer

In *Anuradhapura*, the most common bee honey marketing channel is beekeeper – processor – local consumer. Most of the regional processors buy one raw honey bottle (750ml) at Rs.800 to RS.1000 directly from the beekeepers or honey collectors in the *Anuradhapura* district. The price is varying with the time of the year due to supply. Processors buy 500 to 2000kg of raw honey at once per one honey flow season. Quality of the bee honey, fineness of the bee honey, and purchasing price are the most considering factors by the processor. Processors produce 30ml, 180ml, 750ml, and 1000ml bottles and among them, 30ml and 180ml have more demand (86%).

In supermarkets, there was a low demand for bee honey. Processors are the supply side to supermarkets. Only 6 to 8 bottled bee honey is being sold per month in *Anuradhapura* supermarkets. Imported bee honey collection is more common in observed supermarkets. Garlic in honey (immersed) and cinnamon in honey(immersed) like value-added products are found in supermarkets other than raw honey. Consumers buy bee honey in supermarkets by considering its nutritional value and for beauty cultural purposes. Some consumers in urban areas believe that the quality of bee honey in supermarkets is superior to other local small retail shops.

According to the general definition for wholesaler, it was difficult to identify wholesalers in the *Anuradhapura* district. Beekeeper or processor directly sells their product to either consumer or to the retailer. In retail shops (small trades), 30ml, 90ml, and 180ml bottled bee honey can be commonly found. The processor is the supplier of retail shops.

From the interviewed consumers, 60% said that they buy honey from processors and 30% said that they buy honey from supermarkets. Remaining 10% buy honey from retailers (small traders). Consumers who receive more than Rs.100, 000 monthly income usually buy bee honey from supermarkets for health benefits. They buy bottled bee honey for every three months. Consumers who receive Rs. 50,000 – 100,000 monthly income ranges buy honey from processors. Consumers pay more attention to price, quality, taste, and packaging when they buy bee honey. They highly consider the date of manufacture, expiry date, price, and the quantity displayed within the label.

Table 3: Distribution of gross margin and market margin in value chain actors

Actor	Market Margin (MM) % Rs./30ml bottle	Gross Margin (GM) Rs./30ml bottle
Processor	45	45
Retailer	14	15

Source: Field survey, 2020

The findings of the analysis for the gross margins received by actors in the value chain revealed that processors obtained the highest gross margin and market margin. According to the identified value chain channels, there was a strong forward relationship of the beekeeper. Those could be clearly identified. But it was difficult to identify the backward relationship of a beekeeper with the input supplier.

4.7 Bee honey Production in *Bandarawela*

According to the studied sample in *Bandarawela*, beekeeping was directly linked to a private organization. The linkage ensured a fixed price to the beekeeper and a market to the product. Beekeepers sold a greater portion of their raw honey to the bee honey collection centers. Some amount of raw honey is sold directly to the consumers. In the studied sample 64% of beekeepers have used glass bottles as their packaging type. They did not use any kind of labeling method for their product. They did not practice storing of the bee honey. They did not have stocks of honey at the time of the interview. Due to the heavy rain in 2019, the colony number had reduced significantly. Heavy rains slow honey bees' flying ability and lead breakages in bees' wings (Urquhart, 2018). According to the beekeepers, black mustard tree (*Brassica juncea*), Kudu-Dawula *(Neolitsea fuscata*), and avocado tree (*Persea Americana)* can attract honey bees. Therefore, they think, those types of trees should be protected to protect honey bees.

5. CONCLUSIONS AND RECOMMENDATIONS

5.1. Conclusion

From the study, it can be concluded that gender, age, level of education, land size, information access on apiculture, and credit access for apiculture have a significant influence on the farmers' willingness for apiculture in *Palugaswewa* ASD. According to the results, 54% of the total sample were said they were willing to do apiculture as a supplementary income source. Being women decreases the willingness in apiculture as a supplementary income source mainly due to bee sting phobia and lack of skills. Credit access, land size, and information access on apiculture are positively affected

for the willingness of beekeeping. Of the sample, 46% did not like to apiculture as a supplementary income source. Lack of knowledge in hive management, poor access to inputs, lack of knowledge in market opportunities are the major reasons for not like in apiculture as a supplementary income source. But according to the SWOT analysis conducted, there is a potential and more opportunity in the *Anuradhapura* district for the commercialization of apiculture. The study revealed that there is no commercialized bee honey production in the *Anuradhapura* district. Identified marketing channels revealed that there is a weak backward relationship of a beekeeper with the input supplier. The most common value chain channel for bee honey is beekeeper – processor – local consumer. Processors obtain the highest gross margin along the value chain. According to the conducted SWOT analysis and consumer interviews, it can be identified that there is a growing demand for good quality bee honey for consumption by considering the health and nutritional benefits of bee honey and for beauty cultural uses. Based on the results, apiculture could be introduced as a BIOFIN livelihood option to the fruit and vegetable growing farmers in the *Anuradhapura* district.

5.2. Recommendations

Based on the findings of the study, the following recommendations were made.

1. The extension services are needed to be strengthened for better dissemination of knowledge regarding hive management, harvesting techniques, and value addition. Providing sufficient knowledge about the importance of honeybees and beekeeping in crop production via extension service can help to move chemical-free agriculture.
2. Providing sufficient knowledge and training can improve women participation in beekeeping. Women with bee sting phobia can engage in bee honey harvesting, processing, and selling like activities. Apiculture can be used as a solution for rural women empowerment.
3. The study found that inadequate knowledge in hive management, lack of input supply, and poor harvesting techniques are constraints facing beekeepers. Therefore, there is a need for training beekeepers on appropriate beekeeping and honey harvesting technologies.
4. Providing financial support for the beekeepers. For that mini-bank loans through government state banks would be more supportive for the farmer who is willing to do apiculture in commercialization level.
5. Improvement of market opportunities such as, linking to the export market, value addition, proper packaging, link with the tourism industry to expand the production.
6. Beekeeping should be up scaling up to the commercialization level to improve the living standards of rural people. For that, there should be a proper linkage between beekeepers and input suppliers.

Development of an efficient input supply system improves production and value addition and introducing marketing linkages are important.

7. The study pointed out that there is no proper channel to reach beekeepers. The government should be involved in promoting bee honey-based entrepreneurs. Therefore, beekeepers in *Anuradhapura* can be linked with any private organization by introducing a P4 partnership to protect the beekeeper by ensuring a fixed price and market opportunity. Because in *Bandarawela* there is one of the biggest honey production development projects.
8. The government should assist to improve the quality of bee honey. A certification system can be introduced to maintain the quality of bee honey.

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IMPACT OF DIVIDEND POLICY ON RETURN ON ASSETS: EVIDENCE FROM LISTED NON-FINANCIAL FIRMS IN SRI LANKA.

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ABSTRACT

The dividend policy of a firm is considered as a crucial decision among the management of the organizations. Therefore, the study developed to find out the impact of dividend policy on return on assets of the non-financial firms listed in Sri Lanka, using a randomly selected sample of 100 firms listed in the Colombo Stock Exchange for the period from 2013 to 2017. To test the hypothesis, the study incorporated dividend pay-out ratio, dividend per share as independent variables, sales growth, leverage as a control variable, and return on assets as a dependent variable. Initially the unit root test is carried out to test the stationary of the data set. Descriptive statistics, correlation analysis, and pooled OLS were carried out as research techniques and found that dividend per share significantly impacts on return on assets, and the other hand dividend pay-out ratio does not significantly impact on return on assets of the non – financial firms listed in Sri Lanka. The results suggest that the dividend decisions significantly contribute towards the profitability and therefore, considerable attention is required over the dividend decisions of the organizations and this should be revaluated to serve the investor's potential expectations.

Key words: dividend pay-out, dividend per share, return on assets

1. INTRODUCTION

Dividend decisions are the crucial corporate policy decisions that companies make to ensure their satisfaction with shareholders. On the other hand, it should be balanced with the firm profitability since this influences the retained ratio of the firm. Problems related to dividend policy can be viewed in two different aspects. One aspect of the dividend policy is internal growth and development in capital structure. On the other hand, it is a basic obligation for companies to provide greater prosperity to the shareholders which is bound by the dividend payments. Therefore, the controversy in the dividend decision of an organization is classified as one of the ten unsolved problems in finance (Brealey et al., 2014). The dividend policy of an organization also can be explained as a good marketing tool for a firm since this is one of the key components the investors look into before they make any investment decisions. Ashamu et al., (2012).

Further, the developed dividend policy of an organization is displayed through the pay-out ratio of such an organization. The dividend pay-out ratio explains the proportion of net profit between dividend payments and the amount retained. Therefore, the management should be keen on the factors that determine profitability. In the Sri Lankan context, corporate governance, earnings, investor preference free cash flow, net working capital, investment opportunities, concentrated ownership structure, and firm size, industry impact, past dividends, profitability are identified as the important determinants of the dividend policy (Baker et al. 2019).

The arguments about the dividend payment and related influence on firm values come across an evolution. According to Modigliani and Miller (1953), assuming a perfect market with no taxes and bankruptcy cost, proposed that the dividend policy of a company does not affect the share price of a company itself or the company's capital structure. Later in 1963, including the tax effect on the companies, Modigliani and Miller revised the theory that the increasing level of debt in the capital structure would positively impact on the value of the firm. Therefore, the derived conclusions of the theories regarding dividend policy finally provide an insight into the importance of the dividend payments to the organizations.

A vast number of authors analyzed the impact of dividend policy on firm value and profitability (Sattar et al. 2017; Kawshala and Panditharathna, 2017; Fitri et al., 2016; Khan et al. 2015; Hasan et al. 2015; Gunathilaka, 2014; Thafani and Abdullah, 2014). Even though most of the researches highlighted the problem of dividend policy, the findings of the test results are varying and observed that there is a contradiction in the findings. The following authors, Thafani and Abdullah (2014), Ajanthan, (2013), Kawshala and Panditharathna

(2017), Hasan et al., (2015) found in their research study that there was a positive significant impact observed in dividend pay-out ratio and firm profitability of preceding year. However, on the other hand, researchers found that a negative dividend policy impact on firm profitability (Sattar et al., 2017; Fitri et al., 2016; Hasan et al., 2015; Gunathilaka, 2014). Based on their argument, expressing the earnings volatility of the firm does not depend on the dividend distribution of the firm. Also, dividend payments are viewed as the signalling tool and mollify the market.

Therefore, the researcher identified the varying arguments on the impact of dividend policy on profitability as gab and intended to fill the gap by developing this study.

Further, in the recent past due to the COVID 19 outbreak, the performance of financial firms is getting worse than before. An article published by Fitch Ratings evidenced that the Sri Lankan finance and leasing sector is struggling due to an increase in non-performing loan levels and with the weakening level of profitability because of the credit cost increase and badly affected loan growth. Since there was a negative impact on the profitability of financial firms, the firms would face a serious problem of distributing their profit in-between dividend distribution as well as retention. Therefore, the study developed by excluding the financial firms since there can be abnormal effects on profitability, stated the research problem as follows. 'To what extent the dividend policy has an impact on return on assets of non-financial firms listed in Sri Lanka'. Also, the study mainly focused on the impact of dividend policy on return on assets, since it helps investors to measure the way management follows to generate more income using its available resources or assets. Further, in the perspective of the organization, it is important to understand the potential profitability due to the dividend policy imposed by them rather than the impact on share price, since it is difficult to predict. Therefore, the study developed to find out the impact of dividend policy on return on assets of non-financial firms listed in Sri Lanka.

This paper is organized as follows: Section 2 explains a review of the empirical studies that investigate the dividend policy impact on the profitability of the firms; Section 3 addresses research methods; Section 4 reports the results and discussion, and Section 5 summarises the conclusion.

2. LITERATURE REVIEW

There are developed theories concerning the dividend policy of the firm. Following that the dividend irrelevance theory proposed by Modigliani – Miller (1958) concludes that there is no impact of dividend pattern on share values of the firm. Also, explains that the current savings of the dividend

payment would enhance further on retained earnings and which can be reinvested and future earnings will allow future dividends to grow. Also, the residual approach of dividend policy indicates the earnings available may be retained in the business or it can be reinvested. However, if the funds are not necessary for the business, they can be distributed as dividends. Therefore, the theory assumes that the investors do not differentiate between dividends and retention of the firm. On the other hand, Walter's model, considering the internal rate of return and cost of capital, states that the dividend policy and the value of the firm are significantly related. Accompanied by the argument of Gordon's model, it is clear that a firm share price is dependent on the dividend pay-out ratio. Continuously, the previous authors analysed this area proposed different arguments about the significant relationship and this has been extracted below.

Following authors mentioned a significant relationship exists in between dividend pay-out ratio and firm's profitability.

Thafani and Abdullah (2014), investigated the impact of dividend pay-out on corporate profitability in manufacturing companies listed on the Colombo stock exchange. Using the data from 2007 to 2011, the independent variables of dividend pay-out ratio, firm size, sales growth, and leverage; dependent variables of return on asset and return on equity are calculated. Based on the analysis results, found that there was a positive significant relationship found in-between dividend pay-out ratio and return on assets, return on equity. The study concluded that the dividend pay-out ratio of the firm conveys a certain signal about the profitability.

A study analyzed the relationship between dividend pay-out and firm profitability in listed hotels and restaurant companies in Sri Lanka. To carry out the analysis, dividend pay-out ratio, revenue, and total assets were considered as independent variables, and net profit was used as a dependent variable. The regression analysis results revealed that there was a strong positive relationship between dividend pay-out ratio and firm profitability. Also derived to the conclusion that the dividend policy of the firm was a crucial factor which affects the profitability (Ajanthan, 2013).

Also, a study developed by Kawshala and Panditharathna (2017) examined the effect of dividend policy on corporate profitability in the beverage, food and tobacco industry in Sri Lanka. The study considered the dividend pay-out ratio as the independent variable and return on equity as the dependent variable. Using the collected data from 2012 to 2015, the analysis was carried out using regression analysis and found that there was a positive significant relationship between dividend pay-out ratio and profitability of the firm.

Hafeez et al., (2018) examined the impact of dividend policy on firm performance in listed companies on the Colombo stock exchange from the period 2013 to 2017. Dividend pay-out ratio, earnings per share were considered independent variable and return on assets, return on equity was considered as a dependent variable in this study. The panel data regression analysis was carried out to test the hypothesis of the study and concluded that dividend policy variables show enough evidence for the impact on firm profitability. Further, the study suggested that the current earnings of the firm would provide signals to the future and potential investors and the positive earnings of the firm will enhance the positive dividend policy of the firm in the future.

Farrukh et al., (2017) analyzed the impact of dividend policy on shareholder's wealth and firm performance in Pakistan. The study incorporated 51 firms listed in the Pakistan stock exchange from the period 2006 to 2015. Independent variables considered in the study are dividend per share, dividend yield and earnings per share, share price, return on equity are considered as dependent variables in the study. Based on the regression analysis, the results found that there is a significant positive impact of dividend per share and return on equity.

Additionally, the positive significant impact is supported by Khan et al., (2015). The study investigated the effect of dividend pay-out ratio on firm profitability using the non-financial firms listed in Karachi Stock Exchange 100 index. The data collected for the year from 2008 to 2012 by comprising the independent variables of dividend pay-out ratio, leverage, firm size and the dependent variable of return on assets. By testing the hypothesis, regression results revealed that the dividend pay-out ratio has a significant impact on profitability.

In contradiction to above findings, some researchers found insignificant and negative impact in between dividend pay-out ratio and profitability. In line with that, an author, Rahman (2018) investigated the effect of dividend policy on the firm's performance using 19 cement companies listed in the Pakistan stock exchange from the period 2012 to 2016. Dividend per share, earnings per share, firm size and leverage were considered as the independent variable and firm performance was considered as a dependent variable to test the hypothesis of the study. However, the test results were found as an insignificant impact of dividend per share on firm performance.

Another study investigated the factors that drive the pay-out policy in the bank, finance, insurance and construction sectors. Using annual dividends as the dependent variable, net earnings, financial leverage, institutional investors' shareholding and managerial shareholding as the independent

variable the analysis was carried out and revealed that dividend payments and level of earnings of the firms are negatively related. And concluded that dividend distributions do not reflect the earnings volatility (Gunathilaka, 2014).

Hasan et al., (2015) found the effect of pay-out ratio on firm profitability in the energy and textiles sector listed in Pakistan. The study comprising the data from 1996 to 2008, calculated the dividend pay-out ratio considered as an independent variable and return on assets and return on equity considered as dependent variable. Based on the logarithmic results of the analysis concluded that regardless of the industry, there was a negative impact of dividend pay-out ratio on the earnings of the preceding year.

Fitri et al., (2016) analyzed the factors that impact the dividend pay-out ratio in the listed companies at Jakarta Islamic Index considering the period from 2009 to 2014. Return on assets, debt to equity ratio, asset growth, dividend pay-out ratio of the previous year is considered as the factors that could affect the firm's dividend pay-out ratio. By testing the hypothesis of the study, it was found a negative significant effect of return on assets and dividend pay-out ratio in a year before the dividend pay-out ratio.

Following the above, a research study carried out by Uwuigbe et al., (2012) examined the relationship between financial performance and dividend pay-out ratio based on the listed companies on the national stock exchange. Using the data collected from 2012 to 2017, the independent variables; price to earnings ratio, dividend pay-out ratio and dependent variables; return on assets and return on equity were calculated. According to the regression analysis carried out, the results were found that the dividend policy measures; price to earnings ratio and dividend pay-out ratio do not show any significant impact on firm performance proxies by return on assets and return on equity.

The review of the literature raises a contradiction between the findings among the authors. As explained, the positive and significant impact was posited by Hafeez et al., (2018); Kawshala and Panditharathna, (2017), Farrukh et al., (2017), Khan et al., (2015), Thafani and Abdullah, (2014) Ajanthan (2013). However, the insignificant and negative impact also found by Rahman (2018), Gunathilaka (2014), Hasan et al., (2015), Uwuigbe et al., (2012). Therefore, the present study was initiated to identify the accuracy of the impact of dividend policy on return on assets.

2.1. Conceptualization

Based on the review of literature, the following conceptual model is developed by the researcher.

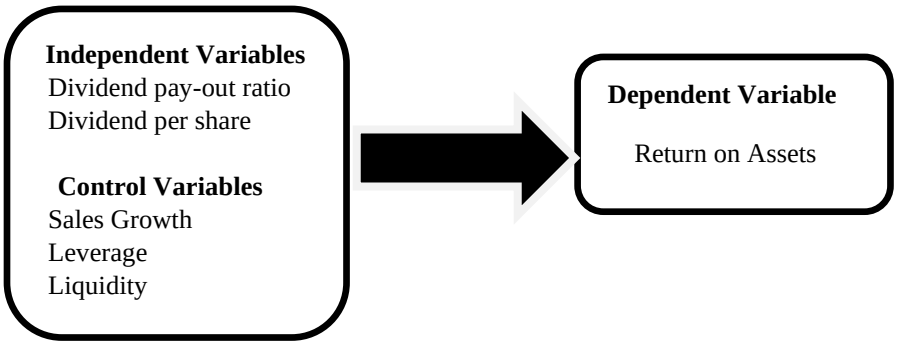

Figure 01: Conceptual Framework

2.2. Operationalization

Table 01: Measurement of variables

Variables	Acronyms	Measures	Authors
Dependent Variables			
Return on Assets	ROA	$\frac{\text{Net Profit before interest and tax}}{\text{Total assets in year t}} * 100$	Adimasu (2019)
Independent Variables			
Dividend Payout Ratio	DPR	$\frac{\text{Dividend per Share}}{\text{Earnings per Share in year t}}$	Adimasu(2019); Sondakh (2019)
Dividend per Share	DPS	$\frac{\text{Dividend Distributed}}{\text{Number of Shares}}$	Farrukh et.al., (2017)
Sales Growth	SGRW	$\frac{\text{Current year Sales} - \text{Previous year Sales}}{\text{Previous years Sales in year t}}$	Ajanthan(2013)
Leverage	LEV	$\frac{\text{Long term debt}}{\text{Total Assets}}$	Adimasu (2019)
Liquidity	LIQ	$\frac{\text{Current Assets}}{\text{Current Liability}}$	Sondakh (2019)

Source: Author Constructed

2.3. Hypothesis of the Study

The researcher developed the hypothesis as follows to test the impact of dividend policy on return on assets.

H_0: There is no significant impact of dividend policy on the return on assets of listed non-financial firms in Sri Lanka.

H_1: There is a significant impact of dividend policy on the return on assets of listed non-financial firms in Sri Lanka.

3. METHODOLOGY

The study intended to incorporate the population of 290 listed firms on the CSE, as of July 2019. The present study excludes Banking, Finance and Insurance companies as they have identical financial characteristics such as; the strength of directives, laws, regulations and formulation of capital structure from non - financial firms. Further, newly listed non-financial and non-dividend paying companies are eliminated in the process of sampling.

Based on the derived samples, 82-firms could be able to consider developing the strong panel data for the five years from 2013- 2017. The data collected from the audited financial reports for the selected companies which are published on the CSE's website.

3.1. Models Specifications

The current study is developed panel data analysis with the 410 observations. 82 non - financial firms are considered in this study considering the panel data collected from 2013 to 2017 to find out the impact of dividend policy on return on assets of Sri Lankan listed non - financial firms.

Initially the unit root test is carried out to test the stationary of the data set. Continuously, pooled OLS is performed to address the impact of dividend policy on return on assets of Sri Lankan non - financial firms. Proposed models are given below:

i) **Pooled OLS Models**

$$ROA_{it} = \alpha_0 + \alpha_1 DPR_{it} + \alpha_2 SGRW_{it} + \alpha_3 LEV_{it} + \alpha_4 LIQ_{it} + \varepsilon_{it} \text{.....(1)}$$

$$ROA_{it} = \alpha_0 + \alpha_1 DPS_{it} + \alpha_2 SGRW_{it} + \alpha_3 LEV_{it} + \alpha_4 LIQ_{it} + \varepsilon_{it} \text{.....(2)}$$

Where,

DPR_{it} - Dividend Payout ratio of firm i at time t.

DPS_{it} - Dividend per Share of firm i at time t.

$SGRW_{it}$ - Sales Growth of firm i at time t.

LEV_{it} - Leverage of firm i at time t.

LIQ_{it} - Liquidity of firm i at time t.

α_0 – intercept coefficient of firm i;

α_1, α_2, α_3, α_4, α_5, α_6 & α_7 – row vectors of slope coefficient of regressors

ε_{it}: Stochastic error term of firm i at time t

u_{it}: error term of firm i at time t

4. RESULTS

4.1. Descriptive statistics

Following table 2 shows the summary details of the data used for the study.

Table 02: Summary Statistics of the variables

Variables	Obs	Mean	Median	Min	Max	SD
DPR	410	0.5387	0.5387	-7.6273	12.9908	1.2077
DPS	410	6.3203	6.3203	0.0000	0.0000	13.3182
SGRW	410	7.2427	6.4593	-99.456	83.1315	18.5136
LEV	410	0.3651	0.3626	0.0010	0.9703	0.21884
LIQ	410	3.4791	1.6064	0.0679	55.5993	6.6949
ROA	410	12.7353	10.1639	-7.5405	100.5177	100.5177

Source: Author Constructed

The mean (median) value of the dividend pay-out ratio is 0.5387 and dividend per share is 6.3203, which implies out of the earnings of the selected non-financial firms approximately half (53.87%) of the earnings are distributed as dividend to their shareholders with a minimum of -7.6273 and a maximum of 12.9908. The dividend per share has no minimum value and a maximum value. The average (median) sales growth of the companies is 7.2427 (6.4593) with a minimum of -99.456 and a maximum of 83.1315. Leverage has an average (median) of 0.3651 (0.3626) with a minimum of 0.001 and a maximum of 0.9703. Also, the mean (median) value of liquidity is

3.4791(1.6064) with a minimum of 0.0679 and a maximum of 55.5993. The dependent variable, return on assets shows an average (median) of 12.7353 (10.16391) with a minimum of -7.5405 and a maximum of 100.5177.

4.2. Unit Root Test

Table 03: Panel unit root test: Summary – Dividend per share

Method	Statistic	Prob.**	Cross sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-8.07718	0.0000	81	324
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-1.85785	0.0316	81	324
ADF - Fisher Chi-square	169.004	0.3370	81	324
PP - Fisher Chi-square	216.231	0.0028	81	324

Sample: 2013 2017

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Source: Author Constructed

The study carried out a unit root test to find out the stationary of the data. The Levin, Lin and Chu t-test shows a p-value of 0.0000, which indicates that there is no unit root in the data set and implies that the considered dividend per share data for the analysis is stationary.

Table 04: Panel unit root test: Summary – Dividend pay-out ratio

Method	Statistic	Prob.**	Cross sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-55.4614	0.0000	82	328
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-10.2574	0.0000	82	328
ADF - Fisher Chi-square	278.243	0.0000	82	328
PP - Fisher Chi-square	320.083	0.0000	82	328

Source: Author Constructed

The Levin, Lin and Chu t-test shows a p-value of 0.0000, which indicates that there is no unit root in the data set and implies that the incorporated dividend pay-out ratio data for the analysis is stationary. Also, the other tests carried out resulted in a p-value of 0.0000. Therefore, the results evidence the stationary of the data set.

Table 05: Panel unit root test: Summary – Sales Growth

Method	Statistic	Prob.**	Cross sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-22.0713	0.0000	82	328
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-5.56977	0.0000	82	328
ADF - Fisher Chi-square	230.890	0.0004	82	328
PP - Fisher Chi-square	259.417	0.0000	82	328

Source: Author Constructed

The Levin, Lin and Chu t-test shows a p-value of 0.0000, which indicates that there is no unit root in the sales growth data set. The data is therefore stationary. Also, the other tests carried out resulted in a p-value of 0.0000. Therefore, the results evidence the stationary of the data set.

Table 06: Panel unit root test: Summary – Leverage

Method	Statistic	Prob.**	Cross sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-5.53157	0.0000	82	328
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-1.48320	0.0690	82	328
ADF - Fisher Chi-square	172.618	0.3070	82	328
PP - Fisher Chi-square	204.715	0.0170	82	328

Source: Author Constructed

The Levin, Lin and Chu t test shows a p value of 0.0000, which indicates that there is no unit root in the data set and implies that the used leverage data for the analysis is stationary.

Table 07: Panel unit root test: Summary – Liquidity

Method	Statistic	Prob.**	Cross sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-28.7951	0.0000	82	328
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-5.50610	0.0000	82	328
ADF - Fisher Chi-square	219.542	0.0025	82	328
PP - Fisher Chi-square	264.616	0.0000	82	328

Source: Author Constructed

The Levin, Lin and Chu t test shows a p value of 0.0000, which indicates that there is no unit root in the liquidity data set. The data is therefore stationary. Also, the other tests carried out resulted in a p value of 0.0000. Therefore, the results evidence the stationary of the data set.

Table 08: Panel unit root test: Summary – Return on Assets

Method	Statistic	Prob.**	Cross sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-14.3375	0.0000	82	328
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-3.46478	0.0003	82	328
ADF - Fisher Chi-square	201.406	0.0248	82	328
PP - Fisher Chi-square	249.249	0.0000	82	328

Source: Author Constructed

The Levin, Lin and Chu t test shows a p value of 0.0000, which indicates that there is no unit root in the return on assets data set. The data is therefore stationary. Also, the other tests carried out resulted in a p- value which is less than 0.05. Therefore, the results evidence the stationary of the data set.

4.3. Correlation Analysis

Table 09, reports the Pearson correlation coefficients between the variables selected for the study. The relationship between the variables can be observed by carrying out the correlation analysis. It can be observed that there is a positive relationship shown in-between the selected independent variables; dividend pay-out ratio and dividend per share and the dependent variable; return on assets (Kawshala and Panditharathna, 2017, Thafani and Abdullah, 2014; Ajanthan, 2013). However, based on the probability value, only dividend per share shows a significant relationship on return on assets (Farrukh et al., 2017). On the other hand, the dividend payout ratio does not show a significant impact on return on assets (Gunathilaka, 2014; Uwuigbe et. al., 2012). Further, other explanatory variables; sales growth and leverage show a positive relationship and leverage shows a negative relationship on return on assets.

Observing the insignificant probability values among the explanatory variables explains that there is no serious interrelationship between the independent variables. Therefore, it also can be concluded that multicollinearity is not a serious problem in this study.

Table 09: Correlation Matrix

Correlation Probability	DPR	DPS	SGRW	LEV	LIQ	ROA
DPR	1.0000					

DPS	0.0468	1.0000				
	0.0468	------				
SGRW	-0.0224	-0.0216				
	0.6509	0.6624				
LEV	-0.0364	0.0957	0.1464	1.0000		
	0.4628	0.0529	0.0030	------		
LIQ	-0.0237	-0.0290	-0.0329	-0.4336	1.0000	
	0.6324	0.5583	0.5068	0.0000	-----	
ROA	0.0574	0.4125	0.0701	0.1249	-0.0084	1.0000
	0.2465	0.0000	0.1563	0.0113	0.8649	-----

Source: Author Constructed

4.5. Regression Analysis

Model (1)
Dependent Variable: ROA
Method: Panel Least Squares
Sample: 2013 - 2017
Periods included: 5
Cross-sections included: 82
Total panel (balanced) observations: 410

Table 10: Impact of dividend per share on ROA

Variable	**Coefficient**	**Std error**	**t-statistic**	**prob**
C	7.1211	1.4959	4.7605	0.0000
DPS	0.4224	0.0470	8.9963	0.0000
SGRW	0.0496	0.0340	1.4587	0.1454
LEV	6.1433	3.2035	1.9177	0.0559
LIQ	0.0985	0.1032	0.9547	0.3403
R-squared	0.1839		Mean dependent var	12.7353
Adjusted R-squared	0.1758		S.D. dependent var	13.8545
S.E. of regression	12.577		Akaike info criterion	7.9139
Sum squared resid	64073.06		Schwarz criterion	7.9629
Log likelihood	-1617.347		Hannan-Quinn criter	7.9333
F-statistic	22.8085		Durbin-Watson stat	0.7774
Prob(F-statistic)	0.000000			

Source: Author Constructed

Based on the findings of regression analysis, it shows that there is a significant positive impact of dividend per share on return on assets since the p-value is being 0.0000 with the t statistic of 8.9963. The finding of the study is in line with the findings of Farrukh, et al., (2017). Therefore, the results supported the developed hypothesis H_1 in this study. The results of the study imply that the increasing level of dividends distributed by the firms would increase the profitability of the next period since the attractive nature of firms would positively impact the stock market to effectively carry out the operations.

The other independent variables considered in this study do not show any significant impact on return on assets in this study. Also, R squared value is derived by the study is 18.39%, which explains that the dependent variable; return on assets is explained as a result of dividend per share only by 18.39%. Also, the F-statistics of the test results shows a value of 0.0000, which indicates the model selected in this study is perfectly fitted.

Model (2)
Dependent Variable: ROA
Method: Panel Least Squares
Sample: 2013 2017
Periods included: 5
Cross-sections included: 82
Total panel (balanced) observations: 410

Table 11: Impact of dividend pay-out ratio on ROA

Variable	Coefficient	Std. error	t-statistic	Prob.
C	8.2928	1.6677	4.9726	0.0000
DPR	0.7474	0.5639	1.3255	0.1858
SGRW	0.0392	0.0371	1.0542	0.2924
LEV	9.1542	3.4892	2.6236	0.0090
LIQ	0.1191	0.1129	1.0550	0.2921
R-squared	0.0249	Mean dependent var.	12.7353	
Adjusted R-squared	0.0154	S.D. dependent var.	13.8545	
S.E. of regression	13.7477	Akaike info criterion	8.0917	
Sum squared resid.	76545.16	Schwarz criterion	8.1407	
Log likelihood	-1653.808	Hannan-Quinn criter.	8.1111	
F-statistic	2.5947	Durbin-Watson stat	0.6818	
Prob.(F-statistic)	0.03607			

Source: Author Constructed

The test results of model 2 indicate that the dividend pay-out ratio does not have a significant impact on return on assets. The finding insists that the distribution of the dividend out of the earnings would reduce the retained amount which can be invested for the firm's future development or expansion. Therefore, increasing the level of dividend pay-out ratio is identified as a factor that doesn't affect the firm profitability proxied by return on assets. The results show a p-value of 0.1858 which is more than the 5% significance level, therefore it can be concluded that the dividend pay-out ratio does not impact on return on assets on non-finance institutions listed on Sri Lanka. The derived result is consistent with the findings of Gunathilaka (2014); Uwuigbe, et al., (2012). However, the finding is contradicted with the findings of Kawshala and Panditharathna (2017).

Among the independent variables, firm leverage shows a significant impact on return on assets. The p-value of leverage shows 0.009 and which is significant at 95% confidence level. The other independent variables do not show any significant impact on the return on asset in model 02. The R squared value shows that only a 2.5% impact on the dependent variable is existed by the independent variables of the study. Also, F statistics value is 0.036, which is less than 0.05 means the model 2 selected in this study is appropriate.

5. CONCLUSION

The study aims at finding the impact of dividend policy on return on assets in listed non-financial firms in Sri Lanka. The data collected from the period of 2013 – 2017, for 82 non-financial firms listed on the Colombo Stock Exchange. The research study utilized regression analysis to test the hypothesis. Based on the regression results, revealed that there is a positive significant impact in-between the variable dividend per share and return on assets on the preceding year (Hafeez, et. al 2018; Farrukh 2017; Kawshala and Panditharathna, 2017; Khan, et al., 2015; Thafani and Abdullah, 2014; Ajanthan, 2013). The results imply a salient importance to the dividend policy of the firm. The increasing level of dividend for the existing shares in a firm would be able to attract more equity towards the firms since the attraction for the shares in the market would rise and gradually in the share price. The scenario would allow the firms to carry out the operations effectively, which enhance the profitability.

However, the other variable; the dividend pay-out ratio measured the dividend policy showed an insignificant impact on return on assets. It suggests that the firms should maintain their image through the signalling effect by paying higher dividends to their shareholders. It manages' responsibility to make decisions over the dividend policy of the firm by incorporating prospects of the firm. The research therefore contributes to the decision makers that the

dividend policy is a crucial factor to be considered to enhance the profitability of the firms.

On the other hand, paying more dividends out of the earned profit would reduce the retained money for the organization growth or development in the future. As well as the lack of money retained within the organization would become a risk in unexpected situations to handle them effectively. Therefore, the dividend distribution and retaining portion out of the earnings to be balanced in-between both optimally according to the firm's special nature.

6. LIMITATIONS AND SCOPE FOR FURTHER RESEARCH

The limitation of the study is pointed out below:

1. The data tested for this study is based on secondary sources published by the companies.

2. Further, to test the results data set collected for 5 years only.

In the future, the studies can develop by increasing the period of data collection. Mainly, future researches can incorporate the determinants of dividend policy such as leverage, capital structure, ownership structure, shareholder's expectations, and the ability to pay tax of the shareholders to enhance the findings in the area of dividend policy.

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DETERMINANTS OF WOMEN'S ECONOMIC EMPOWERMENT: AN EMPIRICAL STUDY AMONG RURAL POOR WOMEN IN SRI LANKA

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ABSTRACT

Women empowerment can be simply defined as giving opportunities to women to enable them to be financially and economically stable. Economic empowerment means the ability to implement decisions that involve the control over allocation of financial resources. Empowerment of women through correct financial decisions in their social and financial activities has a positive effect on their economic empowerment and will ultimately enhance the economic growth. Almost eighty percent of the Sri Lankan population live in rural areas of the country. Out of those, the majority is under the poverty line and is considered as poor. Therefore, the purpose of the research is to identify the determinants of women's economic empowerment and to analyse the most significant determinant of women's economic empowerment in rural poor women in Sri Lanka. Ergo, rural poor women lining under the poverty line in Sri Lanka was taken as the target population. The sample size was 426 women covering all the districts in the country. As per the nature of the primary data, the survey method was used to collect data, the researcher administrated questionnaire was employed as the research instrument. The multilevel mixed sampling method was adopted as a sampling technique. The researchers employed the structural equation model and Smart-PLS 3 as the main analytical software. With the meta-analysis, the researcher

identified five main determinants of women's economic empowerment as: Economic decision-making power, Control over the use of income and expenditures, Control over the time allocation, Leadership in community and financial wellbeing. The Research findings revealed that both economic decision-making power and control over the use of income and expenditures made a significant impact to the women's economic empowerment and the economic decision-making power is investigated as the most significant determinant among the five determinants. The financial wellbeing was revealed as the least significant determinant for determining the women's economic empowerment among the rural poor women in Sri Lanka.

Key words: Women's economic empowerment, Economic decision-making power, Control over the use of income and expenditures, Control over the time allocation, Leadership in the community.

1. INTRODUCTION

Women's economic empowerment (WEE) is the process of achieving women's equal access to and control over economic resources, and ensuring they can use them to exert increased control over other areas of their lives (Haque, & Zulfiqar ,2016). Women's economic empowerment is a top priority in the work to reduce poverty. Women must be viewed, just as men are, as economic actors as well as obvious and necessary agents of change. Sri Lankan as a developing country, women in rural areas have to confront many challenges so as to obtain economic empowerment. A 52% of the entire Sri Lankan population is composed of women, and when it comes to the life expectancy rate, women (79%) and they are 7 years ahead of men (72%) (Global financial development report, 2018). Thus, their expenses spread over a longer period of time. Fortunately, in a general sense only 8% of women among them are illiterate. These women are poor in financial knowledge and particularly, lack of financial skills and proper financial attitudes and therefore, poor in financial decision making. Consequently, if as a nation, Sri Lanka is able to obtain a higher involvement of women into the income generation process, it will not only be a decisive point for a country like Sri Lanka, but also will fulfil the crucial criteria of the millennium development goals (MDGs).

According to the International Monetary Fund (IMF), the participation of women in the workforce is rapidly increasing when compared to men and a 40% of the current global workforce is composed of women (IMF, 2017). In the local context, the labour force partaking based on gender is 78.9% male in contrast to 38.5% female (Global Gender Gap Report, 2018). Sri Lankan women are mostly employed in health and education sectors, hospitality and

textile industries and overseas as domestic assistants. In addition to working at the workplace, women also engage in unpaid household work, thus playing a critical role in providing economic growth. Hence, in the near future, the role played by women in route for their economic empowerment and world prosperity will be of higher importance. In accordance with the above discussion, the researchers noted that women's economic empowerment as a crucial area which needs to be further investigated with relation to enhance the rural development. More specifically, to identify the most significant determinants for enhancing women's economic empowerment is an area which needs the attention of researchers in economics and management. Therefore, this is a contemporary study, on the determinant of women's economic empowerment for enhancing economic development of rural women. Since, majority of women are representing the rural poor segment of the society, this study makes an effort to study the determinants of economic empowerment among the rural women with a low income in Sri Lanka. Examining the relationship between determinants and women's economic empowerment will facilitate to uncover significant determinants of women's economic empowerment, to examine the women's financial awareness and decision-making power, and to examine the determinants on women's economic empowerment. Many researchers have already attempted to study women's economic empowerment in a local context (Jayamaha, 2008; Jayaweera, et al., 2007 Gunatilaka, 2013; Gunewardena, 2015; Herath et al., 2016; Vithanagama R, 2016 Vithanagama, 2016; Kumari 2020a). Nonetheless, they have not attempted to identify the determinants of women's economic empowerment in local context. Since there is an inadequacy of related literature, especially in the local context, the gap has to be bridged if efficient and effective strategies are to be developed as a strategy to enhance women empowerment in order to enhance the financial wellbeing of the rural women. Therefore, this study will focus on five determinants as the most influential determinant for enhancement in women's economic empowerment in Sri Lanka. Hence, the present study will provide insights into the body of knowledge on: economic decision-making power, control over the use of income and expenditures, control over the time allocation, leadership in the community, financial wellbeing and women's economic empowerment. Therefore, the outcomes of the study will be providing further advances in scientific knowledge in the fields of study and developing a structured approach to researching on women's economic empowerment phenomena for further research. Further findings of the study will facilitate the policy decision making within the country, with the purpose of improving economic empowerment in rural women in Sri Lanka. Therefore, the key objective of this study is to examine the most significant determinant to enhance the women's economic empowerment of rural poor women in Sri Lanka. Accordingly, five specific objectives were formulated.

1.2 Research Objectives

There are five objectives that the researcher is expecting to achieve through this study.

Objective 01 – To investigate the relative impact of economic decision-making power on economic empowerment among rural poor women in Sri Lanka.

Objective 02 – To investigate the relative impact of control over the use of income and expenditures on economic empowerment among rural poor women in Sri Lanka.

Objective 03 – To investigate the relative impact of leadership in the community on economic empowerment among rural poor women in Sri Lanka.

Objective 04 – To investigate the relative impact of control over the time allocation and expenditures on economic empowerment among rural poor women in Sri Lanka

Objective 05 – To investigate the relative impact of financial wellbeing on economic empowerment among rural poor women in Sri Lanka.

2. LITERATURE REVIEW

In Sri Lanka, the term empowerment is used in a wide array of literature ranging from academic papers and reports to development strategies and plans. However, an engagement with the definition of women's empowerment is missing, and appears to be taken for granted (IMF, 2015; ADB, 2008). Overall, women's empowerment is perceived as a desirable goal in areas ranging from the economic and social to the political spheres. In fact, Sri Lanka has committed itself to achieving gender equality long before it became a state party to UN Convention on the Elimination of All Forms of Discrimination Against Women (ADB, 2008).

In 1931, both women and men were granted universal suffrage. In 1947, universal free education from Kindergarten to University was made available. Health reforms from the 1930s culminated in the abolishment of charging user fees at government hospitals in 1951, creating universal access to healthcare. Propelled by such rapid growth in social welfare, Sri Lanka has achieved a lot in terms of women's status compared to many other developing countries (Malhotra & Mather, 1997). For example, women's literacy rate of 94.6 percent is only marginally below the men's literacy rate of 96.9 percent.

Moreover, women's educational attainments tend to be higher or at least on par with the educational attainments of men at higher levels of education. For example, in 2012, 13.7 percent of female students passed the General Certificate of Education Advanced Level examination compared to 10.9 percent of male students. Similarly, 2.7 per cent women obtained degrees in 2012, compared to 2.6 percent of men (Department of Census and Statistics, 2015). On the health front, female life expectancy at 79 years is higher than 72 years for men. The maternal mortality rate per 100,000 births has dropped from 61 in 1995 to 30 by 2018, among the lowest ratios globally (Medical Statistics Unit, Ministry of Health, Nutrition and Indigenous Medicine, 2018). Such macro level achievements in narrowing the gender gap is reflected in a Gender Inequality Index of only 0.78 for Sri Lanka (UNDP, 2018), a value that is stronger than in many other developing countries. However, a ranking of 80 at this index value shows that there is more to be done for women's empowerment. Blatant manifestations of gender discrimination in the form of female feticide or infanticide, dowry deaths or widow immolations are not reported in Sri Lanka (Jayaweera, et al., 2007). But glaring disparities do exist between women's social welfare and their economic participation. Despite commendable health and educational attainments, women's labour force participation rates have remained consistently low, hovering around 35 percent over the last decade (Gunatilaka, 2013; Gunewardena, 2015).

This could be, on the one hand, because the growth in Sri Lanka's economy has lagged behind the achievements in terms of social welfare (Malhotra & Mather, 1997). On the other hand, the lower economic participation among women indicates the persistence of gender norms towards work. A study on why Sri Lankan women do no translate their relatively high educational gains into labour force advantages (Gunewardena, 2015) indicates that while women and men have similar skill sets, these are not rewarded equally by the labour market, and that cultural norms in relation to the gender division of household work constrain women from entering the workforce. This is especially true for married women (Gunatilaka, 2013).

Even among employed women, the majority are concentrated in what is deemed to be 'feminine' areas of employment – as garment and textile workers, plantation workers and overseas migrant workers (Jayaweera et al., 2007), emphasizing the influence of gender norms in the labour market. At the other extreme, a study that estimates the earnings function for Sri Lanka from a gendered and ethnic perspective shows that even where women had superior labour market attributes, male average earnings are higher, entirely due to gender discrimination in favor of men (Arun & Borooah, 2011). This evidence clearly brings out the influence of gender ideologies in displacing the benefits of education in catalysing women's economic empowerment.

Although Sri Lanka has produced the first female Prime Minister as early as in 1960, and has had a female Executive President, the overall political participation of women in Sri Lanka is insignificant, and where women hold office, portfolios offered to them tend to be low-key (ADB, 1999; Herath, 2015). Iwanaga (2008) makes two observations on women's political participation in Sri Lanka. On the one hand, they are active voters, fundraisers and campaigners during times of election, but on the other hand, they are hardly present at the decision-making levels of the party structures. Thus, universal suffrage has in fact done little to change the status of the critical mass of women, beyond allowing them to vote (Ibid). The paucity of female representation at decision-making levels limits opportunities to address interests of women, and to instigate socio-economic transformations required to close gender inequalities.

Samarasinghe's (1998) study of the feminization of Sri Lanka's foreign exchange income provides a compelling example of how the absence of women at decision making levels leads to gender discriminations against women. The garment and textile sector, the tea industry and migrant labour, particularly to the Middle East, are predominantly female-labour driven. Yet, these women do not enjoy effective worker rights, suffer from long drawn hours, low wages, and minimal benefits. On the other hand, 'the state, by omission or by commission, seems to take the role of a bystander, rather than that of an active agent looking after the interests of its important foreign currency earning labour force-perhaps because employment in the Free Trade Zones and in domestic service is deemed to be temporary' (Samarasinghe, 1998). Access to resources, another key ingredient in women's economic empowerment, also shows gender biases in practice. Although, in theory, most customary laws in Sri Lanka allow women to enjoy equal inheritance rights with men over land, this may not necessarily be put into practice (ADB, 2008). The Land Development Ordinance (LDO) of 1935 that has been commended for its pro-poor approach for facilitating the allocation of rural lands for settlement and expansion to the landless has contributed to women's unequal access to land. Specifically, the inheritance schedules of the LDO had stipulated that if the allotted died intestate, only the eldest son could inherit the land holding (Alailima, 2000). The civil conflict has added another layer of complexity for women's land ownership in Sri Lanka. The application of the 'head of the household' concept, often understood as the male member of the family has resulted in discrimination against women in issues related to property and land ownership (Rai, 2014). Although empirical evidence on gender biases in Sri Lanka's formal credit market and access to other productive resources is limited, there are studies on the role of microfinance in women's economic empowerment. For example, Herath et al., (2016) found in their analysis that participating in microfinance programmes had a strong positive impact on a woman's ability to make decisions about the use

of credit, income generated from it as well as how it would be used. The thirty-year long armed conflict that Sri Lanka experienced until May 2009 has also had significant consequences for gender relations in Sri Lanka. The loss of over 70,000 lives in the conflict, displacement of over 1 million people, sometimes many times over due to both the conflict and the Tsunami disaster, disability, widespread destruction of property and assets, damages to infrastructure and losses of cultivable land (Arunatilake, Jayasuriya, & Kelegama, 2001; Ofstad, 2002) are some of the many negative consequence's women in the North and East of Sri Lanka have had to deal with during and in the aftermath of the conflict. Although displacement due to conflict has been common to men, women and children of Tamil, Sinhala and Muslim ethnic origins, the majority of the victims happen to be Tamil women. Life in displacement has disintegrated traditional gender roles for women, yet the new economic responsibilities have not been accompanied by opportunities for women's long-term empowerment (Bandarage, 2010). The return to gender status quo and the absence of sustainability of women's empowerment during conflict could be possibly because there is no culturally appropriate idiom to articulate and support women's transformed gender roles during peacetimes (Rajasingham & Senanayake, 2004). Disability often compounds women's barriers to social, economic and cultural empowerment. A study that looks at women with disabilities in the North Central and Eastern Provinces shows that women who had acquired disabilities due to the conflict were mostly confined to the home, and had no facilities or support to extend their agency beyond that (Samararatne & Soldatic, 2015). The lacuna of a gender dimension to post-conflict livelihood interventions has in many ways contributed to the reinforcement of traditional gender norms. For example, in the former North Eastern Province, women who have survived the conflict and experienced its trauma have expressed displeasure in having been removed from the planning process of the rebuilding process (Wanasundera, 2006). Moreover, the exclusive focus on war widows and female headed households has caused intervention programmes and projects to lose track of many other categories of women and their needs as well (Wanasundera, 2006). Still, the community induced barriers such as institutional factors (Thesawalamai law that allows women to own land, but not to exercise command over it) and sociocultural factors seem to play a more dominant role than any business (gender discriminations against women in business) or state-inflicted barriers (security phobia) in impeding women's economic empowerment (Sarvananthan, 2015). This shows once again that unless gender norms entrenched in a society are not transformed by conflict, there is little or no positive change a conflict brings about for women's overall agency.

While reviewing previous literature in the purpose of identifying the antecedents of women's economic empowerment, researcher did meta-

analysis and selected determinants which were commonly used in the previous studies. Accordingly, there were five main determinants identified. According to the previous literature, measurement indicators for the women economic empowerment can be measured by considering the situation of rural poor women in Sri Lanka. Therefore, as per the explanation in following section, some commonly adopted dimensions such as economic decision-making power, control over use of income and expenditures, leadership in the community, time allocation and financial wellbeing can be employed in the present study to measure economic empowerment of the rural women. Those indicators are validated by exploratory factor analysis. More specifically, the contribution of those determinants for enhancing women's economic empowerment is an area which needs the attention of researchers in economics and management. Therefore, this is an empirical study, which mainly focused on identifying main determinants of women's economic empowerment and attempt to excavate the most significant determinant among them.

3. METHODOLOGY

According to the Uma Sekaran there are two main research philosophies that can be adapted in the management research objectives as deductive and inductive. (Sekaran, 1992) However the deductive approaches based on theory develop the hypothesis based on the empirical evidence. Accordingly, present research has been designed as the deductive approach adapted from the positivism research paradigm. Further according to Leedy 1993 "that there are two main approaches qualitative and quantitative as per the empirical nature of the present research has been developed based on the quantitative approach" (Leedy, 1993). However as per the data requirement primary was collected. In this process primary data were collected based on a sample through the detailed self-administrated questionnaire. The questionnaire has developed based on the measurement instrument.

After considering geographical dispersion and characteristics of the target population, the multilevel mixed sampling method was utilized as the appropriate method for collecting data among rural poor women in Sri Lanka. The multilevel mixed sampling method involves several levels in selecting the sample and at each level, probability or purposive sampling method will be adopted. Accordingly, the sample selecting process for the study consists of four levels.

Level 01 – Dividing sample in to strata based on provinces in Sri Lanka

In the first stage of the sampling procedure, researcher divided the entire sample into 9 strata based on each province of the country. Therefore, the selected sampling method was stratified sampling. However, the target population was not equally distributed among each province and therefore, 426 respondents were proportionately divided based on the total number of rural poor women represented in respective provinces. Sample distribution among each province is given in table 1.

Table 1: Sample Distribution

Province	**Rural poor women (Target Population)**	**Calculation**	**Sample**
Western	30,968	30,968/338,203X426	39
Central	50,276	50,276/338,203X426	63
Southern	33,947	33,947/338,203X426	43
Northern	35,271	35,271/338,203X426	44
Eastern	44,068	44,068/338,203X426	56
North Western	31,645	31,645/338,203X426	40
North Central	20,791	20,791/338,203X426	26
Uva	34,314	34,314/338,203X426	43
Sabaragamuwa	56,923	56,923/338,203X426	72
Total Sample			426

Source: Estimated by the researcher based on survey reports (2018) of Department of Census and Statistics, Sri Lanka

Level 02 – Selecting divisional secretariat (DS) divisions in each province

In stage 2, the researcher selected 03 divisional secretariat (DS) divisions from each province with having the highest poverty ratio. The statistics about the poverty relevant to each DS division was taken from the household income and expenditure survey conducted by the Department of Census and Statistics (DCS), Sri Lanka in 2016. The DS divisions selected by assuming areas of highest poverty ratio are the best territories to collect relevant data, the selected sampling method is judgmental sampling.

Level 03 – Selecting one Grama Sevake (GS) divisions in selected DS division

In stage 3, the researcher selected one GS division with the highest poverty ratio. The data about the poverty level and number of households remaining under the poverty line was collected by respective DS office in each selected division. Further, required information was gathered by list of "Samurdhi" beneficiaries. Therefore, the judgmental sampling method was again applied in this stage.

Level 04- Selecting respondents within a location

After selecting GS division for data collection, enumerators were then advised to select respondents randomly. For this purpose, records of the GS office of respective divisions were considered. However, the respondents who fill the requirements of the sample were selected only by paying special attention to their demographic factors such as age, education, and occupation etc. Further, enumerators were advised to select respondents for representing the behavioural profile of the selected target population. Accordingly, data was gathered from 27 GS divisions and the final stage of the sampling procedure was adopted to the simple random sampling as a probability sampling method.

As questionnaire of the present study has selected Likert scale as the response formation to measure latent variables, data can be considered as categorical data. Therefore ±5% was adopted as the margin of errors in this research. Therefore, the minimum sample size was estimated as 384 based on Cochran's sample size estimating formula given below. It is more popular among social science researchers for determining the sample size for their surveys (Bartlett et al., 2001).

$$n = \frac{t^2 \times p(q)}{(d)^2}$$

n = minimum sample size
t = confidence level (at 95% - standard value of 1.96)
p(q) = estimated prevalence of variable (50% due to target population is estimated 338,203)
d = estimated margin of error (at ±5% - standard value of 0.05)

Even though minimum sample size was estimated as 384, it was noticed that the researchers have freedom to increase the estimated sample size based on the non-response rate of similar studies (Kline, 2011). However, the researcher observed that non response rate is at higher level in the case of researchers adopt to self-administrative questionnaires. The sample of the

study represents the rural women and it was identified that there are some limitations of adopting to self-administrative questionnaires in present research context. Therefore, the researcher decided to use researcher administrative questionnaires for the data collection process. Even though, Sekaran & Bougie, (2016) noted that non response rate is minimum in collecting data from researcher administrated questionnaire, the researcher decided to increase sample size by considering 10% contingency factor due to some possible missing data. Accordingly, the total sample size was calculated as (384/90X100= 426) 426.

Further, the researcher conducted exploratory factor analysis (EFA) to re-examine whether measurement items are accurately represented in the respective dimension of WEE. According to Hair, Gudergan, Ringle, & Sarstedt, (2018), Confirmatory tetrad analysis (CTA) was conducted to confirm the reflective nature of the WEE (see Annexure 01). The researchers employed the Smart-PLS 3 as the main analytical software.

Based on the exploratory factor analysis, there were five main determinants confirmed and used to design a conceptual framework as denoted in figure 1.

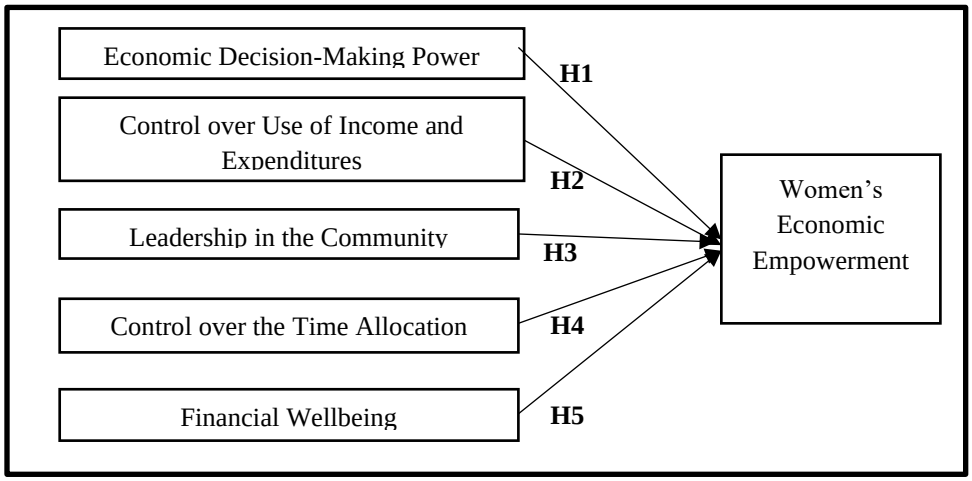

Figure 01: Conceptual Framework

3.1. Hypotheses

According to the conceptual framework, there were five main hypotheses formulated and tested. As per the research objectives those hypotheses were formulated and tested with the support of Smart PLS 3 software.

3.1.1. Economic decision-making power

Decision-making power is the ability to influence decisions that affect one's life – both private and public (Deka, 2015). Formal access to positions of authority and to this process is an important, if insufficient, condition for women to have decision making power in the public domain (Adam, et al., 2018; Islam, 2014). Decision-making power is a composite of access, capabilities and actions that shape whether women have influenced the society or their private life. While considering economic empowerment, the decision-making power consider under the financial point of view (Deka ,2015; Karunathilake, 2016). Therefore, in the research context, the decision-making power referred as, to the power of poor rural women to make household economic decisions for achieving short- and long-term economic wellbeing in their households Arora, 2016; Maheswari, 2016; Haque et al., 2016; Bonga et al., 2016; Singh et al.,2017; Lusardi et al., 2017; Roy et al 2018; Kumari et al., 2020b). According to the literature, researcher built first hypothesis as,

H1: There is a significant influence of economic decision-making power on women's economic empowerment among rural poor women in Sri Lanka.

3.1.2. Control over the use of income and expenditures

The next important issue is controlling over the use of income and expenditure. Without this step, will be spending money out of track. To control the income and expenditure, it is best to directly prepare the detailed document to control an income and expenditure, while developing the budget Alkire, et al., 2012; Biswas, 1999; Malhotra et al., 2002; Deka, 2015. The household budget should be communicated with all the relevant staff. Under the women's economic empowerment, controlling power of the income and expenditure of family members as well as controlling herself is an important phenomenon of her empowerment (Deka ,2015; Gilabert, Dietz, & Grabs, 2016; Soni, et al., 2016. Deka ,2015; Gilabert, Dietz, and Grabs ,2016). Therefore, in the research context, controlling the use of income and expenditure is termed as; authority and willingness of poor rural women to control the over expenditure of their families with the purpose of using these resources in productive ways. Karunathilake, 2016; Arora, 2016; Maheswari, 2016; Haque et al., 2016; Bonga et al., 2016; Lusardi et al., 2017; Singh et

al.,2017; Kumari et al., 2020a). By considering above literature second hypothesis was formulated as,

H2: There is a significant influence of control over the use of income and expenditures on women's economic empowerment among rural poor women in Sri Lanka.

3.1.3. Leadership in the community

Women have long been the mainstay of communities and are heavily involved in community initiatives in various forms. Though often the unrewarded heroes of community action, women's role in community development has become important (Dietz, & Grabs ,2016; Alkire, et al., 2012; Deka ,2015). Especially in some communities like rural poor, they have established themselves as leaders in community development and acquired the skills that have brought positive change to their communities. Women leaders play key roles in establishing and maintaining important relationships and networks in their communities (Gilabert, Gilabert, Dietz, and Grabs ,2016; Karunathilake, 2016). They face cultural, economics, and social barriers in leading the community and in many cases overcoming those barriers become their motivation. While their comprehensive approach has influenced the evolution and nature of community development, women's contributions have been neither widely acknowledging nor explicitly credited. The results of this study provide deeper insights into women's thinking about leadership and community development (Arora, 2016; Maheswari, 2016; Haque et al., 2018; Bonga et al., 2016; Singh et al.,2017; Lusardi et al., 2017). Therefore, according to the research context, leadership in the community means the extent to which poor rural women can influence the common decisions of community and degree of other community people willing to accept their views (Kumari,2017; Roy et al., 2018; Vithanagama, 2018). With respect to the existing literature the third hypothesis developed as follows.

H3: There is a significant influence of Leadership in the Community on women's economic empowerment among rural poor women in Sri Lanka.

3.1.4. Control over the time allocation

A study by Hoque and Itohara (2009) reported time allocation is contributing to an extent in planning family activities and participation in family leisure time based on the decision-making power of the rural women. And also stated that a time spending programme among family members is developing leadership of the rural women (Arora, 2016; Maheswari, 2016; Haque et al., 2016. This study was conceptualized considering basically five important dimensions of women's economic empowerment that identifies five principles

in which empowerment are achieved including control over the time allocation as an important dimension (Swamy,2014; Deka ,2015; Gilabert, Dietz, and Grabs ,2016; Karunathilake, 2016). Therefore, according to the research context, control over the time allocation means ability and willingness of poor rural women for allocating their time for different tasks and ability to decide their leisure time in between their day to-day work schedule (Bonga et al., 2016; Singh et al.,2017; Lusardi et al., 2017; Kumari, 2017; Roy et al 2018. With the existing literature fourth hypothesis designed as,

H4: There is a significant influence of control over the time allocation on women's economic empowerment among rural poor women in Sri Lanka

Another sub-dimension of the study is financial well-being, attributing to some extent in generating economic empowerment and participation in financial decision-making power of the rural women (Dash, Prasad & Koshy ,2016).

3.1.5. Financial wellbeing

Empowerment is power or authority to someone. Women are important to the family as a mother as well in a society. Women are working in the family without any compensation but in the workplace, they earn more money with their high position. Empowerment of women refers to giving decision making power to women in social, economic and financial empowerment of life (Haque, 2016; Gilabert, Dietz, and Grabs ,2016; Karunathilake, 2016; Arora, 2016;). Empowerment of women is very much essential to achieve sustainable development. The process of empowerment should start from the home. Women's position in the household determines women's autonomy in the family (Kabeer, 1999; Haque & Zulfiqar ,2016). According to the financial wellbeing, it is worth to examine whether can decide about household matters like buying household assets and managing financial resources, having access to bank, have security of financial future, have ability to make choices or have enough assets to do day to day financial transactions (Deka, 2015; Maheswari, 2016; Haque et al., 2016; Bonga et al., 2016). Therefore, according to the research context financial well-being referred as: ability of poor rural women to fully meet current and ongoing financial obligations and feel secure in their financial future, and is able to make choices that allow them to enjoy life. (United Nation Foundation ,2015; Biswas ,1999; Krishnan and Silvi,2011; Singh et al.,2017; Lusardi et al., 2017; Kumari et al., 2020c). Taking under consideration of above literature final hypothesis as designed as follows

H5: There is a significant influence of financial wellbeing on women's economic empowerment among rural poor women in Sri Lanka

4. RESULTS AND DISCUSSION

The structural model will have denoted the relationships among the main constructs in the conceptual framework by using path coefficients. Accordingly, the path coefficients represent the hypothesized relationships among the constructs in the model (Ringle et al., in 2018; Hair et al., 2018). The value for path coefficient should fall in between -1 and +1. When it tends towards +1, it is interpreted as strong positive relationship which is statistically significant and vice versa.

However, whether Path coefficient is significant or not depends on its standard error which can be obtained by considering two types of criteria. As bootstrap standard error enables to compute the ***t*** values and ***p*** values for all structural path coefficients, ***p*** value can be considered to assess significant level of path coefficients (Hair et al., 2017).

Generally, 5% significant level can be considered as the threshold level of ***p*** value, accordingly, ***p*** value must be smaller than 0.05 to demonstrate the significant relationship among constructs. Further, respective ***t*** value should fall in the range of - 1.96 to +1.96 to assure the significant level of path coefficients. Therefore, said condition can be considered as criteria 01. Moreover, Hair et al., (2018) suggest that researchers should check the bootstrap confidence intervals under the BCa approach in order to further test the significant levels of path coefficients, in the case of 1st criterion is not satisfied.

Accordingly, if the bootstrap confidence interval does not have a zero value, the path coefficient is still significant. It can be considered as criterion 02. The path diagram is given in the figure 02 and the summary of the statistics taken by bootstrapping techniques are given in table 2.

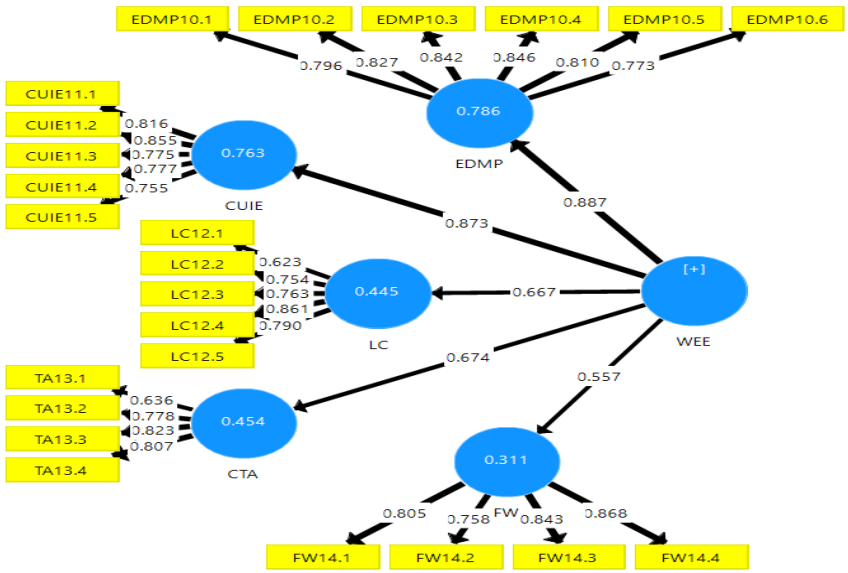

Figure 2: The relationship between determinants of WEE on WEE

Table 2: Determinants of Women's Economic Empowerment

	Beta	Sample Mean (M)	(STDEV)	T Statistics	P Values	2.50%	97.50 %	Hypotheses
EDMP-> WEE	0.887	0.888	0.012	73.868	0	0.861	0.909	H1: accepted
CUIE -> WEE	0.873	0.874	0.013	69.077	0	0.847	0.899	H2: accepted
LC -> WEE	0.667	0.667	0.037	18.134	0	0.583	0.737	H3: accepted
CTA -> WEE	0.674	0.670	0.040	17.049	0	0.575	0.741	H4: accepted
FW -> WEE	0.557	0.556	0.054	10.279	0	0.443	0.656	H5: accepted

Source: Author constructed based on the output results

Based on the Smart PLS output, hypotheses were tested and results summarized according to the respective hypotheses.

The individual path coefficients in the structural model and the table 2 represents the standardized Beta (**β**) coefficients in an OLS regression which express a one-unit change of the exogenous construct changes the endogenous construct by the size of the path coefficient while everything remain constant. However, whether path coefficients are significant or not should be determined by testing statistical criteria.

First hypothesis H1 considered, need to test the influence made by economic decision-making power on women's economic empowerment. According to table 2, It explained that path coefficient (**β** = 0.887) was reported as a positive impact of economic decision-making power on women's economic empowerment. Further, in terms of the other statistical values as: **p** = 0.000; **t** = 73.868; and Bca (Bias Corrected) confidence intervals lower = 0.861 and upper = 0.909, revealed that the determinant taken strong significance on the level of women's economic empowerment, the impact made by the economic decision-making power on women's economic empowerment was significant. Further, it was revealed that, among the set of determinants, economic decision-making power, is the most significant determinant of women's economic empowerment.

Therefore, H1 was accepted.

As per the second hypothesis (H2), it was tested the influence made by control over the use of income and expenditures on women's economic empowerment. According to the output results it explained as: slandered **β** = 0.873, it revealed that there is a strong positive influence made by control over the use of income and expenditures on women's economic empowerment; **p** = 0.000 means, probability value is with the threshold value (0.05); **t** = 69.077 explained high **t** value than 1.96; and Bca (Bias Corrected) confidence intervals lower = 0.847and upper = 0.899 (no zero laid between two confidence intervals), it confirmed that, the control over the use of income and expenditures significantly effects on the level of women's economic empowerment among rural poor women. While considering the significant variables of women's economic empowerment, control over the use of income and expenditures is the second most influential determinant of women's economic empowerment. Therefore, H2 was accepted.

As another highest path coefficient (**β** = 0.667), leadership in the community has a significant impact on women's economic empowerment. Further it was confirmed with the other statistical tests as well as: **p** = 0.000; **t** = 18.134; and Bca (Bias Corrected) confidential intervals lower = 0.583 and upper = 0.737

(no zero laid between two confidence intervals), it further confirmed that, there is a significant influence made by the leadership in the community on women's economic empowerment. Therefore, H3 was accepted.

With respect to the fourth hypothesis (H4) path coefficient (**β** = 0.674), control over the time allocation has positive influence on women's economic empowerment of rural poor women. Significance was further, revealed by the other statistical tests as well as: **p** = 0.000; **t** = 17.049; and Bca (Bias Corrected) confidential intervals lower = 0.575 and upper = 0.741 (no zero laid between two confidence intervals). Therefore, it elucidated that there is a positive significant influence of control over the time allocation of rural poor women with their economic empowerment. Hence, H4 was accepted.

Further, when it considers the last hypothesis, the path coefficient (**β** = 0.557) was reported in the path of financial wellbeing. That means there is a positive significant influence of financial wellbeing on women's economic empowerment. Further, in terms of the other statistical values as: **p** = 0.000; ***t*** = 10.279; and Bca (Bias Corrected) confidential intervals lower = 0.443 and upper = 0.565, revealed that there is a strong positive influence made by the financial wellbeing and it also was the significant determinant of women's economic empowerment. Therefore, H5 was accepted.

According to the output results, all **p** values are below 0.05 and all the ***t*** values are above 1.96. Therefore, all 05 hypotheses are empirically supported. The results further verified that there is no zero laid between lower confident interval and upper confidence interval. the most significant dimension of women's economic empowerment is economic decision-making power with highest ***t*** value (73.868) among the other determinants. The control over the use of income and expenditures was recognized as the second most influential variable of WEE. Financial wellbeing was identified as the least significant determinant due to the respective path coefficient has the lowest ***t*** value (10.279). In order to test the hypotheses, researcher formulated five hypotheses and all the hypotheses were empirically supported.

5. CONCLUSION

According to the research objectives, it is needed to examine the most significant determinant of the economic empowerment among rural poor women in Sri Lanka. As per the findings shared as in the above paragraph all the respective paths' coefficient is estimated as statistically significant. Therefore, the results demonstrate that all the five hypotheses were accepted and all the objectives were achieved. Therefore, the overall findings imply that all the determinants are significant and positively impact on the level of economic empowerment of rural poor women in Sri Lanka. Therefore, the

results further confirmed that objectives supported through literature as well as through empirical evidence in the present research context. According to the previous literature, women's economic empowerment is considered in different aspects but no one considered all the dimensions together to determine the women's economic empowerment. Moreover, there aren't any research studies which can be seen based on the identification of the determinants of women's economic empowerment in local context, where rural poor women are focused. Therefore, it can be concluded that present research is able to fill the literature gap emphasized by the researcher based on the relationship between determinants and women's economic empowerment.

Based on the findings, it was noted that the economic decision-making power has the highest significant contribution in developing women's economic empowerment among the rural poor women in Sri Lanka. The financial wellbeing is identified as the least significant determinant of women's economic empowerment. Therefore, it is a respectable indicator for the policy makers to pay more attention on the economic decision-making power as the highest significant factor for further improvements. It explained that women's decision-making power is in some substantial level, so this factor could be used to motivate them to more savings and investment within the household for enrich their financial wellbeing. Especially, the attention of policy makers should be focused on financial wellbeing as the least significant factor of women's economic empowerment to encourage that determinant to enhance the economic empowerment among the rural poor women in Sri Lanka. As per the researcher recommendations, the government should guide the financial institutions to encourage women's financial status while providing loan facilities targeting the rural poor self-employed women. Therefore, research findings could be useful for the policy level of the country to enhance women's economic empowerment. Based on research findings the policy makers could understand which aspect of determinants perform less but are important to determine the level of women's economic empowerment. For instance, findings of the study revealed that the least significant determinants as financial wellbeing. Ergo, policy makers should have focused on implementing some workshops on how to manage money, invest, etc. to enhance their financial skills. Further, this study provides a special contribution on existing literature and on the policy makers as findings provide a clearer understanding in significant determinants on women's economic empowerment. One of the main limitations in the study is, the research has only focused on the quantitative aspect. It is recommended for the future researchers to focus on qualitative data as well.

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Annexure 01 : CTA results

WEE	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values	Bias	CI Low	CI Up	Alpha adj.	z (1-alpha)	CI Low adj.	CI Up adj.
1: CUIE11.1,CUIE11.2,CUIE11.3,CUIE11.4	0.19	0.186	0.047	4.075	0	-0.004	0.117	0.27	0	3.566	-0.027	0.36
2: CUIE11.1,CUIE11.2,CUIE11.4,CUIE11.3	0.193	0.191	0.044	4.361	0	-0.003	0.123	0.269	0	3.566	-0.038	0.354
4: CUIE11.1,CUIE11.2,CUIE11.3,CUIE11.5	0.163	0.162	0.032	5.088	0	-0.001	0.112	0.217	0	3.566	-0.05	0.279
6: CUIE11.1,CUIE11.3,CUIE11.5,CUIE11.2	-0.068	-0.068	0.024	2.829	0.005	0	-0.108	-0.028	0	3.566	-0.154	0.018
10: CUIE11.1,CUIE11.2,CUIE11.3,EDMP10.2	0.049	0.047	0.025	1.969	0.05	-0.002	0.01	0.092	0	3.566	-0.038	0.14
13: CUIE11.1,CUIE11.2,CUIE11.3,EDMP10.3	0.054	0.052	0.03	1.809	0.071	-0.002	0.007	0.106	0	3.566	-0.051	0.163
17:	0.017	0.016	0.035	0.485	0.628	-	-	0.07	0	3.56	-	0.14

CUIE11.1,CUIE11.2,EDMP10.4, CUIE11.3						0.001	0.04	6		6	0.108	4
20: CUIE11.1,CUIE11.2,EDMP10.5, CUIE11.3	0.018	0.018	0.036	0.49	0.625	0	-0.042	0.078	0	3.566	-0.112	0.148
24: CUIE11.1,CUIE11.3,EDMP10.6, CUIE11.2	-0.067	-0.066	0.021	3.219	0.001	0.001	-0.102	-0.033	0	3.566	-0.142	0.006
27: CUIE11.1,CUIE11.3,FW14.1,CUIE11.2	-0.038	-0.038	0.022	1.709	0.088	0	-0.074	-0.001	0	3.566	-0.117	0.041
31: CUIE11.1,CUIE11.2,CUIE11.3,FW14.3	0.019	0.018	0.036	0.532	0.595	-0.001	-0.039	0.08	0	3.566	-0.108	0.149
36: CUIE11.1,CUIE11.3,FW14.4,CUIE11.2	-0.023	-0.024	0.021	1.121	0.263	-0.001	-0.056	0.012	0	3.566	-0.096	0.051
41: CUIE11.1,CUIE11.2,LC12.2,CUIE11.3	0.076	0.076	0.037	2.083	0.038	0	0.016	0.137	0	3.566	-0.054	0.207
46: CUIE11.1,CUIE11.2,CUIE11.3,LC12.4	0.076	0.075	0.035	2.167	0.031	-0.001	0.019	0.134	0	3.566	-0.048	0.201
52: CUIE11.1,CUIE11.2,CUIE11.3,TA13.1	0.035	0.038	0.025	1.43	0.153	0.003	-0.008	0.073	0	3.566	-0.056	0.12
59: CUIE11.1,CUIE11.2,TA13.3,CUIE11.3	0.222	0.22	0.043	5.119	0	-0.001	0.152	0.294	0	3.566	-0.069	0.377

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Editorial Preface

We are pleased to present Volume 3(2) of the Sri Lankan Journal of Banking and Finance (SLJBF), a refereed journal of Banking and Finance published by the Department of Banking and Finance, Wayamba University of Sri Lanka. SLJBF provides a unique platform for researchers, academicians, professionals, and research students to impart and share knowledge in the form of high-quality research papers to infuse innovative systems and methods to the economy and finance as a whole. In line with that SLJBF invites you to join with us by writing quality manuscripts in the discipline of economics, banking and finance.

We received a fair response for the call for papers and out of the paper received five papers selected for the publication through the rigorous blind review process. We wish to thank all the authors who contributed to this issue by submitting their novel research findings. The volume 3(2) of SLJBF deals with timely important topics, FDI Spillover Effects in Sub-Saharan Africa, Customer Perception on Virtual Banking Services of Commercial Banks, Impact of Dividend Policy on Return on Assets, Determinants of Women's Economic Empowerment and Potential for Commercialization of Apiculture as a Biofin Livelihood Option in Anuradhapura District. Thus, the journal has widened its scope to appeal to a wider readership with varied interest and needs.

The first paper by Adamu Jibrilla, Dunusinghe Priyanga presents a very interesting meta-analysis on the impact of FDI spillovers on the performance of firms in the sub-Saharan Africa (SSA). Findings of the study confirmed that there is no evidence of statistically significant FDI spillover effect in SSA However, study reports that FDI spillover effects in SSA are likely to be country specific and among panel studies, depending on the sample size, ownership structure, research and development as well as absorptive capacity of firm.

Zooming into the local context, the second paper by Tharshini and Rajeshwarn examine customer perception on virtual banking services of commercial banks in Trincomalee District. Authors argue that the level of virtual banking and customer satisfaction is higher in the District and results

revealed that virtual banking services quality has a positive impact on customer satisfaction. The model framework developed in this study provides useful information for managers and policy makers for designing appropriate virtual banking systems in order to maintain profitable customers within the banking system.

In the third paper, De Silva, Premarathna and Mapatuna investigate the potentials for commercialization of apiculture as a biofin livelihood option in Sri Lanka. Based on the results, authors concluded apiculture could be introduced as a biofin livelihood option for the fruit and vegetable farmers in the Anuradhapura district in Sri Lanka.

The fourth article is a case study on dividend policy of listed non-financial firms in Colombo Stock Exchange, Sri Lanka. This paper investigates the impact of dividend policy on return on assets. The authors Ravindran and Kengatharan argue dividend policy as a leading factor to be considered to enhance the profitability of the firm. Moreover, authors advocate the importance of maintaining a trade-off between distributions of dividend and retaining a portion out of earnings so as to ensure the sustainability of organization.

The final paper, by Thakshila Kumari, investigates the determinants of women's economic empowerment with special reference to rural poor women in Sri Lanka. This study seeks to identify most influential factors on women economic empowerment in Sri Lanka. The finding of the study is useful for the policy makers to enhance women's economic empowerment.

On this occasion, I would like to extend my sincere thanks to the dedicated panel of distinguished reviewers, members of the editorial advisory board, members of the editorial board and the assistant editors for their unstinting and voluntary contribution to make this issue a success. The continued support of the governing body of the Wayamba University of Sri Lanka in this endeavor is also acknowledged.

Prof. R.A Rathanasiri
Chief Editor
Sri Lankan Journal of Banking and Finance
Department of Banking and Finance
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Aims and Scope

The Sri Lankan Journal of Banking and Finance (SLJBF) is a refereed Journal bi-annually published research papers and scholarly work by the Department of Banking and Finance, Wayamba University of Sri Lanka. Sri Lankan Journal of Banking and Finance (SLJBF) publishes theoretical and empirical papers spanning all the major research fields in economics, banking and finance The aim of the SLJBF is to bringing the gap existing in the theory and practice of Economics, Banking and Finance by encouraging researchers, academicians, professionals, and research students to impart and share knowledge in the form of high quality research papers to infuse innovative system and methods to the economic and financial system as a whole. Thus, the journal's emphasis is on theoretical and empirical developments and policy-oriented research in economics, banking and finance.

Core Principles

- Publication in the journal of banking and finance is based upon the editorial criteria cited and the evaluation of the reviewers (each manuscript will be sent two reviewers);
- Priority is given for novelty, originality, and to the extent of contribution that would make to the particular field.
- Conceptual papers based upon current theory and empirical findings and contribute to the development of theory in the domain of Banking and Economics are also welcome.

The journal welcomes and publishes original articles, literature review articles and perspectives and book reviews describing original research in the fields of economics, banking and finance. The core focus areas of the journal include;

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- Bank Failure and Financial crisis

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- Corporate Governance and Ethics
- Credit Rating
- Derivative Pricing and Hedging
- Financial Economics and Mathematics
- Financial Engineering
- Financial Modeling and Forecasting
- Financial Risk Management and Analysis
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Contents

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FDI SPILLOVER EFFECTS IN SUB-SAHARAN AFRICA: A META-ANALYSIS

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ABSTRACT

This study employs meta-analysis to examine the effect of FDI spillovers on the performance of firms in Sub-Saharan Africa (SSA). Previous FDI spillover studies in SSA have produced mixed results making it difficult to guide policy making. Evidence has shown that among other factors, publication bias has made some authors to report only results that are consistent with theory or those that are statistically significant. Data for this study were obtained from the previously published FDI spillover empirical studies through google search and other search engines using keywords such as effect of FDI spillovers on productivity of firms, FDI spillovers in SSA, FDI spillovers in Africa among others. We employ the use of funnel asymmetry test (FAT) and precision-effect test (PET) to carry out the meta-analysis by using mixed-effect multilevel and ordinary least squares techniques of analysis where we address the within-study dependency and between-study heterogeneity commonly associated with meta-analysis. We account for different study characteristics of the previous studies to examine the reason for the mixed findings and find that there is no evidence of statistically significant FDI spillover effect in SSA and the reported effects in the existing literature suffer from positive publication bias. This means that studies that reported results with positive estimated coefficients were more likely to be accepted for publication. We recommend that on the one hand, authors should try to

report results dictated by the data instead of theory and on the other hand, policymakers should treat research findings with extreme caution. More research in this area is encouraged in SSA for a much better understanding of the existing discrepancies in the FDI spillover studies.

Keywords: FDI, Technology Spillovers, Meta-analysis, Publication bias, SSA

1. INTRODUCTION

Foreign direct investment (FDI) has been acknowledged by researchers and policymakers as an important instrument of development and a good channel for the transfers of capital, technology and knowledge from industrialised economies to developing countries to boost productivity, employment, economic growth and even infrastructures through both the direct and spillover effects (Javorcik, 2004; Markusen & Venables, 1999; Moran, 2011; Saggi, 2002).

Over the past few decades, Sub-Saharan Africa (SSA) has experienced increasing FDI inflows as reported in figure 1 as the share of FDI inflows in GDP of the region continued to follow an upward trend from 0.07 per cent in 1980 to its highest value of 4.13 per cent in 2001[1] and then settled to 3.24 percent and 2.00 per cent in 2008 and 2018 respectively. During this period, the majority of SSA countries relaxed their investment restrictions and started to pursue more liberal investment policies which include providing incentives for foreign investors in virtually all sectors. The increasing FDI inflows in the region attracted much attention of researchers who examined different dimensions of FDI effects on the region including the spillover effects of FDI on the performance of local firms.

However, the existing studies provide mixed and inconclusive findings regarding the spillover effects of FDI on the performance of firms in SSA possibly due to country specific factors, data, or methodologies employed. Some studies find positive while others have reported zero and even negative results on the effect of FDI spillovers in the region. Therefore, it becomes imperative to combine these findings in order to determine the causes of the discrepancies in the results and the extent to which these findings can be utilized for policymaking and guide future research.

[1] The higher value of FDI inflows of 4.13 as a percentage of GDP recorded in 2001 has been most due to the favourable investment policies adopted by most countries in the Sub-Saharan African region around late 19s. The discovery of oil and other mineral resources in some African countries during this period also contributed to this high percentage of FDI inflows in the GDP of the region.

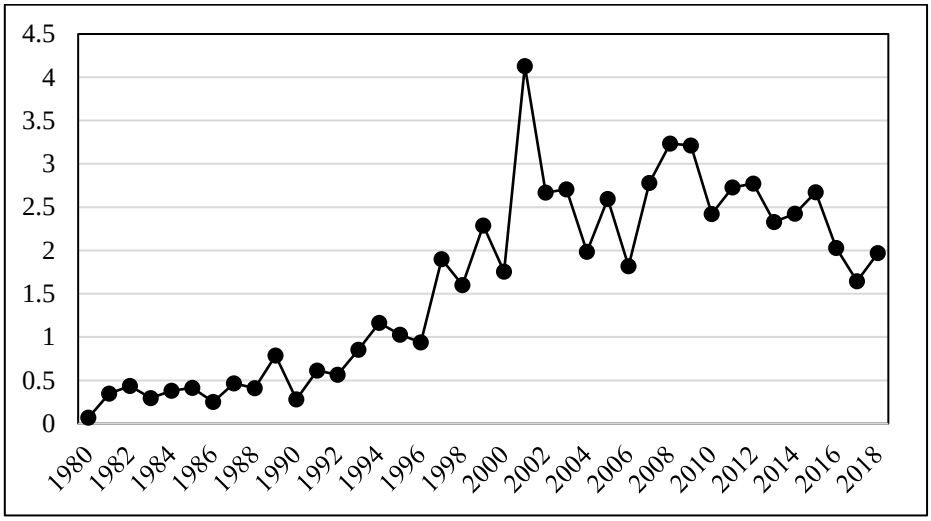

Figure 1: FDI inflows as percentage of GDP in SSA (1980-2018)

Source: Authors' plot based on data from WDI (2019)

Thus, the aim of this is to employ the use of meta-analysis by combining the existing FDI spillover studies in SSA to ascertain the rationale behind such differences in the studies and the extent to which findings these FDI spillover studies in SSA can be generalised and if they can be reliable for policy making. This study is structured as follows: background, review of literature, methodology, findings and discussion as well as conclusion.

Meta-analysis technique has been employed to integrate and summarize the estimates of the previous empirical studies as suggested in the literature. Despite the significant recognition of this meta-analysis, there is paucity of studies using this approach in SSA.

Meta-analysis has become a popular approach in applied economics in recent years for integrating and summarizing several empirical studies and resolving inconsistencies arising from the existing studies (Havranek & Irsova, 2010; Meyer & Sinani, 2005). The pioneer economics studies that employed meta-analysis approach are Ashenfelter et al., (1999) to estimate returns to schooling, Gorg and Strobl (2001), Djankov and Murrel (2002) for enterprise restructuring analysis in transition economies, Gallet and List (2003) for cigarette demand and De Mooij and Ederveen (2003) for elasticities of tax-rate (Meyer & Sinani, 2005). Since then, many studies in economics have employed the use of meta-analysis.

Meta-analysis is used to statistically integrate the empirical estimates of many previous studies that investigated the same phenomenon. Therefore, the meta-analyst collects many existing empirical studies and analyse them to determine the rationale behind the inconclusiveness in the findings. It majorly determines the authenticity of the reported effects (genuine effect) and whether such reported effects are due to publication selection bias.

Publication selection bias is an important concern in meta-analysis because some authors, editors and reviewers may be more likely to publish certain FDI spillover estimates than others. They may likely prefer certain spillover estimates in terms of signs and statistically significance, and in most cases tempted to report and publish positive spillover estimates, especially for developing countries. In other words, researchers, reviewers and editors may be more likely to accept and publish estimates that demonstrate statistical significance and or that are consistent with the predominant theory (Hampl, Havranek & Irsova, 2019).

2. LITERATURE REVIEW

Foreign direct investment has been recognized in both policy and academic contexts as an essential medium of technology and knowledge transfers from developed nations to developing countries through the cross-border activities of multinational enterprises. FDI spillovers have been acknowledged as a transfer of knowledge and technology from foreign-owned firms to domestic owned firms (Hanousek, Kocenda & Maurel, 2010) either through the horizontal channels or through the supply chain relationships (Vertical channels). The main argument in the literature for expecting the transfers of technology and ideas from foreign subsidiaries to local firms is the possession of superior technology by foreign owned firms and also that these firms outperform domestic firms as demonstrated in many previous empirical studies (Sgard, 2001; Javorcik, 2004).

FDI spillovers through the horizontal channels appear to the most controversial and complex channel of technology transfers due to the complexity of the transmission channels. The dominant transmission channels of horizontal spillovers as identified in the literature are competition, imitation or demonstration, and labour turnover or labour mobility (Crespo et al., 2009; Javorcik, 2004,2007).

It has been argued in the literature that the entrance of foreign multinational enterprises into a particular industry in a host country triggers competition in the industry forcing the domestic firms to upgrade their technologies, efficiently employ existing resources, improve their performance and subsequently improve their innovation and productivity (Lenaerts &

Merlevede, 2011; Javorcik, 2007, Blomstrom & Kokko, 1998; Crescenzi et al., 2015). Initially, competition from multinational enterprise may have a crowding out effect on domestic firms where the activities of foreign owned firms would force the inefficient and unproductive local firms out of business allowing only the competitive ones (Narula & Marin,2005; Markusen & Venables, 1999).

The demonstration effect or imitation channel of horizontal spillover is an important channel where domestic firms learn technologies introduced by foreign owner firms through learning-by watching or by imitating the technologies of the foreign firms. This channel proved effective in many emerging economies and it works best for domestic firms that have adequate absorptive capacity.

Labour turnover or mobility has been regarded as an essential horizontal FDI channel of technology and knowledge transfer. The literature demonstrates that technology or knowledge may spillover from foreign to domestic firms through the movement of workers from foreign multinational enterprises (previously working for foreign owned firms) to locally owned firms. The idea is that those workers might have received training and become more familiar with some of the advanced technologies used by foreign firms, and this knowledge is subsequently transferred to domestic firms which is expected to improve their productivity and innovation.

Researchers have argued that it is likely that labour turnover may favour foreign multinational enterprise since they are likely to pay higher wages than domestic firms (Heyman et al. 2007; Taylor & Driffield, 2005, Vahter & Masso, 2018) making it easier for them to attract the most productive workers from locally owned firms. Both anecdotal and empirical evidence have shown that foreign owned firms pay higher wages than domestic firms and therefore they tend to draw the most productive employees from domestic firms (Sinani & Meyer, 2004; Crespo & Fontoura, 2009; Saggi, 2002). However, the hiring and firing of workers by foreign firms and voluntary quitting of jobs by workers of foreign firms may facilitate such labour movement from foreign to domestic firms thereby increasing the productivity of the latter since these workers might have already acquired knowledge from previous employers (Gorg & Strobl,2005; Girma, 2003; Glass & Saggi, 2002).

Given all this, there are mixed findings regarding the effect of horizontal FDI spill over on productivity of firms in the host countries. Some studies find empirical evidence in support of positive horizontal spillover effects (Vahter, 2004; Ayyagari & Kosova, 2010; Damijan et al.,2003b), others find negative effect through this channel (Konigs, 2000; Atieno, 2015) and yet there are studies that find no effect at all (Damijan et al.,2003a).

Other important channels of FDI spill overs are the supply chains, also called vertical spillover channels which occur through the backward and forward linkages between foreign owned firms and locally owned firms in the downstream and upstream sectors. The backward FDI spill overs arise as a result of backward linkages between foreign owned firms and their domestic suppliers of intermediate inputs in the downstream sector. The forward spillovers on the other hand are due to the linkages between foreign owned firms and their domestic customers of intermediate inputs in the upstream sector. Both these supply chain relationships result in the transfer of technology and knowledge from foreign to domestic owned firms through offering of training, technical assistance, deadlines, other related supports provided by the multinational enterprises to their domestic suppliers and customers in the host countries.

Researchers have argued that backward spill over channel is more effective in transferring technology and knowledge because foreign subsidiaries have no incentive to prevent such knowledge to their domestic suppliers since they also benefit from the high quality of inputs from such relationships as a result of the training and guidelines and other technical assistance provided by them. Majority of FDI spillover studies find evidence in support of positive backward spill over effect in the host countries (Boly et al.,2015; Javorcik, 2004; Lenearts & Merlevede, 2017) while very few find evidence of negative backward spillover effect (Di Ubaldo et al., 2018; Dogan, Wong & Yap, 2017). Some of the main reasons attributed to the negative backward spillover effect include proximity to home countries of foreign subsidiaries, internalisation of supply chain and lack of absorptive capacity by the domestic firms.

Forward FDI spill over channel is the least considered channel in the literature but it also tends to be effective for technology transfer since domestic customers benefit from the high quality of inputs, they buy from foreign owned firms which may reduce damages and improve productivity. Some of the few studies that provide evidence of forward FDI spillovers include (Lenearts & Merlevede, 2011).

2.1 FDI Spill overs in Sub-Saharan Africa

The rising importance of FDI inflows in Sub-Saharan Africa over the past few decades has attracted the attention of researchers to examine the effect of FDI on the economy of the region as well as the spillover effect of FDI on the performance of firms in the region. The first study that deeply examined the spillover effect of FDI in SSA was by Amendolagine et al., (2015) using a

novel cross-sectional data collected by UNIDO[2] (2010) in 19 SSA countries. They find evidence of a positive backward spillover effect which was attributed to high demand of local inputs by foreign owned firms as well as firms owned by Africans in diaspora.

Gorg and Seric (2015) used the same dataset of UNIDO (2010) to examine the linkages between foreign subsidiaries and the performance of local firms in SSA taking into account the role of assistance either from foreign owned firms or from the government. They find evidence of both forward and backward spillover effects in increasing the innovation and productivity of domestic firms in the region. Similarly, Amendolagine (2016) and Amendolagine et al., (2016) examine the spillover effect of FDI in the region by considering the role of the investor's country of origin. They show that foreign multinational investors that originated from OECD[3] countries generate more domestic linkages and FDI spillovers compared to firms that originated from BRICS[4] countries. In contrast, Seyoum et al., (2015) examined the effect of Chinese foreign investments on local firms in this case of Ethiopia and find evidence that foreign firms are more productive than domestic firms and they generate positive spillover effects for domestic firms that have adequate absorptive capacity.

Using multilevel analysis, Sanfilippo and Seric (2015) examined the spillover effect of FDI on performance of firms in SSA where they emphasized on the role of agglomerations and find a negative correlation between horizontal spillover and performance of local firms. This result was attributed to the negative competition effect associated with FDI where foreign subsidiaries take away the market shares of domestic firms and crowd out domestic investors.

Atieno (2015) also finds a negative horizontal spillover effect but positive backward spillover effect in the case of Kenyan manufacturing sector. This confirms the argument that backward spillover is most likely to take place due to the fact that foreign owned firms may not want to prevent knowledge spill over to their domestic suppliers because they equally benefit from such relationships. Malikane and Chitambara (2018) also finds a positive but weak evidence of FDI spill overs in SSA countries conditional on the technological gap between foreign and domestic owned firms. Similar outcome was also

[2] United Nations Industrial Organisation (UNIDO) collected a unique firm level dataset from 19 Sub-Saharan African countries in 2010 which gave many researchers the opportunity to undertake extensive studies on FDI spillovers in the region.

[3] This stands for the Organisation for Economic Cooperation and Development and its members consists of developed countries.

[4] This refers for countries of Brazil, Russia, India, China and South Africa which are regarded to be developing countries which are on the path to becoming developed.

shown by Danquah and Amakwah-Amoah (2017) in a group of 45 African countries while Barasa et al. (2019) find a negative outcome for the FDI spillovers for countries within the region.

These differences in the findings have been a matter of concern for both researchers and policy makers because it is difficult to understand the right findings for policy prescriptions. Hence, researchers over the last few years have adopted the use of meta-analysis in the field of economics in order to better understand the genesis of these discrepancies and the possible way forward and how it can be beneficial for policy making especially in developing countries.

2.2 Meta-Analysis and FDI Spill overs

Since the pioneer use of meta-analysis in the empirical investigation of phenomena in economics and business (Ashenfelter et al., 1999; Gorg & Strobl, 2001), many researchers have adopted this research approach in order to understand the rationale behind the divergent findings in the existing FDI spillover literature. Gorg and Strobl (2001) employed meta-analysis to examine the effect of research design and data on the reported FDI spillover effects and showed that model specification and data type (cross-sectional and panel) have influence on the heterogeneity in the previous studies. They also indicated the presence of publication bias in their primary studies.

Similarly, Hanousek, Kocenda and Maurel (2010) employed meta-analysis to examine the direct and indirect effects of FDI in emerging European markets and showed that both the direct and indirect effects become weaker over time. They also detected the presence of publication bias and also showed that research design has effect on the existing empirical results in the literature. This is similar to Demena and Bergeijk (2016) who also examined the effect of FDI spill over on the performance of firms in developing countries and found that FDI spillover effects are affected by publication bias, arguing that such bias overstates the spillover effects.

Harvanek and Irsova (2010) studied the meta-analysis of horizontal FDI spillovers and found a significant effect of research design and publication bias on the results of the previous spillover studies. Wooster and Diebel (2006) examined the spillover effect of FDI on productivity in developing countries using meta-analysis in which they accounted for a variety of research design to determine the aspect that influence the size, significance and sign of FDI spillover effects. They found that the mixed results of the FDI spill overs in developing are partly due to model specification.

3. METHODOLOGY

This study reviews the existing meta-analyses and primary[5] studies in order to analyse the sources of heterogeneity in the existing studies and to understand the genuine spillover effects and whether there is presence of publication bias. All relevant and known published and unpublished FDI spillover related studies in SSA have been identified and reviewed. In line with standard methodology for collecting data for meta-analysis, the relevant primary studies were identified with the use of extensive search engines through the Google scholar, Scopus and Econlit using keywords such as "FDI spillovers in SSA or in Africa", "effects of FDI spill overs on productivity of domestic firms in SSA or in Africa", "FDI productivity spillovers in SSA". Although numerous FDI studies appeared, only studies that relate to FDI spill overs, productivity and domestic linkages, and have reported both the estimates and their standard errors were included in the sample.

Therefore, a total of 18 primary studies as presented in table 1 met our criteria which provided the required data of 1104 observations[6] in which 69 percent is journal and 31 percent consists of working papers and theses. There are thirty-one (31) potential sources of heterogeneity identified, including journal quality coded from the primary studies.

Since the essence of meta-analysis is generally to ascertain the genuine effect and whether there is no publication bias, funnel asymmetry test (FAT) and precision-effect test (PET) have been used in line with previous meta-analyses to determine the publication bias and genuine FDI spillover effects. Funnel plot has been used to obtain the visual suggestion of the degree of publication bias in the primary studies. We address the issue of within-study dependency and between-study heterogeneity by estimating the study-clustered standard errors and by employing the mixed-effects multilevel (MEM) modelling approach and Ordinary Least Squares (OLS). The standard meta-regression model (MRM) is specified as follows:

$$e_{ij} = \alpha + \beta se_{ij} + u_{ij} \quad (1)$$

Where e stands for the FDI spillover estimates from primary studies, se stands for the standard errors and u represents the disturbance terms.

[5] Primary studies are the existing studies that have investigated the FDI spillover effects in SSA which we have used to construct a database for the analysis in this study. We follow the established methodology to arrive at the final dataset used for the analysis.

[6] The 1104 observations were arrived at after eliminating outliers in the data which we considered to impact tremendously on the outcome of the analysis.

It is expected that e_{ij} (spillover estimates) varies randomly around α, and the standard errors (se_{ij}) approaches zero and e_{ij} be independent of their standard errors. We divide equation (1) by the se_{ij} to adjust for the possibility of heteroskedasticity and this method yields the following standard meta-regression model in the form of weighted least square model in which the t-statistics is now the response variable.

$$t_{ij} \equiv (e_{ij}/\, se_{ij}) = \alpha + \beta(\frac{1}{se_{ij}}) + \gamma \boldsymbol{X}_{ij} + \varepsilon_{ij} \qquad (2)$$

Where t_{ij} represents the t-statistics of spillover estimate i from study j and ε_{ij} is ratio of the error term to standard errors in equation (1). The slope of equation (2) estimates the magnitude and direction of a genuine spillover effect (PET) while the constant or intercept term tests for publication bias in the effect (FAT). X_{ij} consists of control variables that account for different sources of heterogeneity in the previous empirical findings of the FDI spillover effects.

The use of t-statistics for meta-analysis has been reported by previous studies (Gorg & Strobl, 2001; Meyer & Sinani, 2005) as appropriate because it is dimensionless as against the magnitude of spillover estimates. We model a list of possible heterogeneity sources, and by following previous meta-analyses, these sources are based on specifications, estimation techniques, data and publication characteristics of the primary studies. All estimations have been carried out using Stata 15.

Table 1: Primary Studies from SSA Employed in the Analysis

S/N	Authors	Country of study	Frequency of FDI Spill over Estimates	Percent	Cumulative percent
1	Amendolagine et al., (2013)	SSA	64	5.80	5.80
2	Amendolagine et al., (2017)	SSA	98	8.88	14.67
3	Atieno (2015)	Kenya	77	6.97	21.65
4	Blanas et al., (2019)	SSA	29	2.63	24.28
5	Boly et al., (2015)	SSA	25	2.26	26.54
6	Demena (2016)	SSA	23	2.08	28.62
7	Dunne and Masiyandima (2014)	SADC	56	5.07	33.70
8	Dutse (2012)	Nigeria	6	0.54	34.24
9	Gold et al. (2017)	SSA	118	10.69	44.93

10	Gorg and Seric (2015)	SSA	188	17.03	61.96
11	Gorg and Strobl (2005)	SSA	74	6.70	68.66
12	Mugendi (2014)	Kenya	12	1.09	69.75
13	Mugendi and Njuru (2016)	Kenya	3	0.27	70.02
14	Perez and Seric (2015)	SSA	28	2.54	72.55
15	Sanfilippo and Seic (2015)	SSA	122	11.05	83.61
16	Seyoum et al. (2015)	Ethiopia	75	6.79	90.40
17	Waldkirch and Ofosu (2010)	Ghana	91	8.24	98.64
18	Yauri (2006)	Nigeria	15	1.36	100.00
	Total		1,104	100.00	

Note: SSA stands for Sub-Saharan Africa while SADC stands for Southern Africa Development Community.

Source: Author Constructed

4. RESULTS AND DISCUSSION

In line with previous studies, the funnel plot for determining the publication bias has been presented in figure 2 which appears to be full and symmetrical. However, the right portion of the funnel seems to be a little heavier than the left portion, suggesting the presence of a positive publication bias of the FDI spillover estimates. This indicates that studies that reported negative FDI spillover estimates were less likely to be accepted for publication or authors were less likely to report negative estimates.

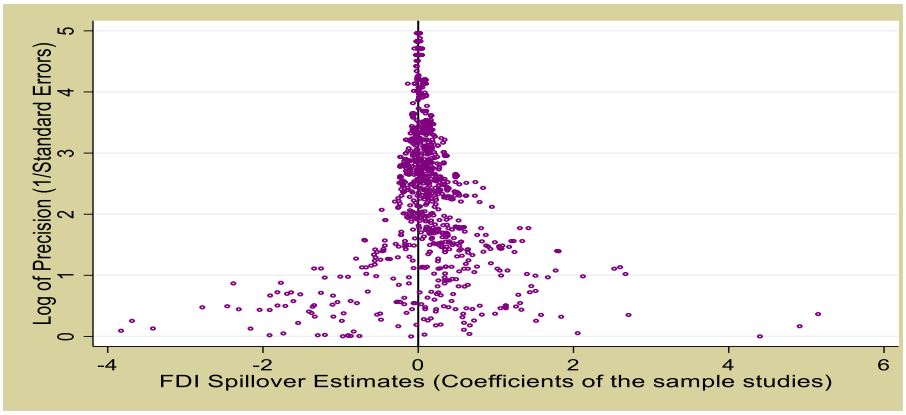

Figure 02. Funnel Plot showing positive publication bias

Source: Authors' plot using data constructed from primary studies

Since visual inspection of the plot may likely be subjective, we present the formal publication bias test using funnel asymmetric test (FAT) as shown in table 2 to confirm the result shown by the funnel plot.

Table 2. Bivariate Meta Regression for FAT and PET Tests

	All samples	Peer-reviewed studies	Studies in High-Ranking Journals
	Dependent variables: t-statistics		
Publication bias (FAT)	$0.950^{***}(0.365)$	$0.848^{*}(0.458)$	$0.751(0.528)$
Genuine effect (PET)	$-0.002(0.007)$	$0.002(0.010)$	$0.005(0.010)$
Observations	1104	764	814

Note: ***, * stands for 1% and 10% level of significance respectively. Mixed-effects multilevel estimation technique with study-clustered standard errors is used to correct for possible heterogeneity as well as within-study dependency.

Source: Author Constructed

The FAT reveals that a positive publication selection bias is strongly significant for the full sample, confirming the result of funnel plot in figure 2, though the bias decreases with the quality of studies published. Peer-reviewed papers show evidence of a weak positive publication bias whereas studies published in leading journals show no evidence of a significant publication selection bias. The magnitudes of the bias also decrease accordingly.

Similarly, the precision-effect test (PET) which estimates the genuine effect, shows that for the full sample, FDI spillover effect is negative while it is positive for both peer-reviewed and leading journals. However, the coefficients are not statistically significant. This result implies that the reported FDI spillover effects in SSA may be due to publication bias but studies published in leading journals are free from such selection bias. The insignificance of the genuine-effect coefficient implies that no significant positive FDI spillover effect has taken place in the Sub-Saharan African region.

Table 3. Reduced-form Multivariate Meta-Regression for Sources of Heterogeneity

	Model 1 Mixed-effect multilevel (MEM)	Model 2 Ordinary Least Squares (OLS)
	Dependent variable: t-statistics	
Bias (intercept)	$6.434^{***}(0.028)$	$6.441^{***}(0.056)$

Specification		
Joint ventures	$3.129^{***}(0.136)$	$3.176^{***}(0.201)$
Absorptive capacity	$2.871^{***}(0.064)$	$2.883^{***}(0.101)$
Firm age	$0.520^{***}(0.123)$	$0.480(0.376)$
R&D	$0.685^{***}(0.116)$	$0.720^{***}(0.136)$
Firm size	$-2.319^{***}(0.065)$	$-2.302^{***}(0.202)$
Exporter	$-0.348^{***}(0.093)$	$-0.364^{***}(0.107)$
Estimation method		
FGLS	$-6.491^{***}(0.304)$	$-6.583^{***}(0.339)$
Random effect	$-4.096^{***}(0.279)$	$-4.178^{***}(0.336)$
Tobit	$-2.967^{***}(0.048)$	$-2.986^{***}(0.176)$
GMM	$3.343^{***}(0.084)$	$3.323^{***}(0.052)$
Data		
Time span	$-1.062^{**}(0.030)$	$-1.071^{**}(0.047)$
Cross section	$-3.140^{***}(0.123)$	$-3.175^{***}(0.149)$
Panel	$3.246^{***}(0.182)$	$3.304^{***}(0.397)$
Country specific	$2.964^{***}(0.173)$	$3.017^{***}(0.196)$
Sample size	$0.0002^{***}(0.0001)$	$0.0002^{***}(0.0001)$
Publication		
Peer-reviewed journal	$-3.454^{***}(0.108)$	$-3.485^{***}(0.133)$
Leading journal	$0.815^{***}(0.086)$	$0.840^{***}(0.173)$
Observations	1013	1013
Sd (Residual)	2.356 (0.170)	
95% Conf. Interval	[2.046 , 2.713]	

Note: Note: ***, * stands for 1% and 10% level of significance respectively. Mixed-effects multilevel estimation technique with study-clustered robust standard errors is used to correct for possible heterogeneity as well as within-study dependency reported in model 1. Model 2 is estimated using OLS with study-clustered robust standard errors as robustness check and the results do not appear to differ significantly. FGLS stands for feasible generalised least squares and GMM stands for generalised method of moment. General -to-specific modelling approach is used to arrive at the reduced form models which provided only significant estimates. The genuine effect (precision variable) is dropped because it appears to be statistically insignificant repeatedly.

Source: Author Constructed

There are many factors that can explain the heterogeneity in the existing empirical spillover findings in SSA. These factors incorporate the research

design and other factors that could affect the results of previous studies. We account for most of these factors following previous studies and report the reduced-form multivariate meta-regression results for the potential sources of heterogeneity as presented in table 3. Generally, we control for model specifications, estimation methods, data type, and quality of publication of the studies.

The study characteristics or sources of heterogeneity appear to have divergent influence on reported FDI spillover effects. The specification of the studies has a strong influence on reported FDI spillovers in SSA as joint venture, absorptive capacity, firm age as well as research and development increase the reported FDI spillovers whereas firm size and exporter firms reduce them. The reported FDI spillover estimates in SSA are also strongly influenced by estimation methods with studies using GMM being 3.3 percent more likely to find positive FDI spillovers. On the other hand, studies that employ FGLS, random effects and tobit methods tend to find negative spillover effects.

Similarly, reported FDI spillover effects also depend on the characteristics of data used as such effects decrease with the time-span of the data and cross-section studies, whereas panel and country-specific studies increase the spillover effects. In other words, studies employing longer time span and cross-sectional data are strongly likely to report negative FDI spillovers while panel, country-specific and studies that employ large sample are more likely to find positive spillovers. In the same vein, while studies published in peer-reviewed journals are more likely to report negative spillovers than working papers and theses, those published in leading journals increase the chances of finding positive FDI spill overs in SSA and they are free from publication bias.

However, accounting for the study characteristics, does not reduce the positive publication bias rather the bias increases for the full sample. This indicates that studies are more likely to report positive FDI spill over estimates irrespective of the significant influence of the sources of heterogeneity or the study design. The results show that, on the average, for every FDI spillover study undertaken, the positive publication selection bias increases by 6.4 units, holding other factors constant. Therefore, the lack of evidence for the genuine effect may largely be due to the publication selection bias which means that significant FDI spillover effect might not have taken place in SSA. This indicates that FDI in SSA does not significantly improve the productivity of domestic firms which may partly to the high concentration of foreign multinational enterprises in the extractive industries and the infrastructure deficiency in the region.

5. CONCLUSION

This study uses meta-analysis to analyse the findings of the previous FDI spillover studies in SSA. The study reveals important findings that are consistent with the majority of the previous meta-analyses in the field of FDI spillover literature and have potential policy implications. Essentially, the reported positive spillover effects in the primary studies cannot be supported statistically and these studies have been found to suffer from severe positive publication bias with the exception of studies published in high-ranking journals. However, positive FDI spillover effects in SSA are more likely to be country-specific and among panel studies, depending on the sample size, ownership structure, research and development, as well as absorptive capacity of firms.

There is no evidence of a significantly genuine effect from FDI spillovers in SSA and there is a large case of publication selection bias. This has a great policy implication especially in the time when Sub-Saharan African governments are in need of a policy guide. Therefore, results from the existing FDI spillover studies in Sub-Saharan African countries must be treated with extreme cautions and policymakers should rely more on studies published in high and reputable journals because this finding shows that publication bias is likely in studies published in these journals.

Since studies published in other journals are mostly contaminated with publication bias, their findings may be less reliable for policymaking. This is because the reported FDI spillover estimates may not necessarily represent the true reflection of the reality of benefits that domestic firms gain from the foreign presence since researchers may be more likely to report positive results.

It is important that researchers and publishers adhere to research and publication ethics rather than giving too much preferences to studies that produced estimates which are in line with existing theory. This may aggravate the proliferation of publication bias among the researchers and publishers which may be misleading for policymaking. There is also a need for more studies on FDI spillovers in SSA using the meta-analysis techniques to provide much better understanding of the differences in the existing empirical literature as research in this area is very limited in SSA.

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AN EMPIRICAL EXAMINATION OF CUSTOMER PERCEPTION ON VIRTUAL BANKING SERVICES OF COMMERCIAL BANKS IN TRINCOMALEE DISTRICT

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ABSTRACT

Banks are the financial intermediates which have contributed a lot for the economy of the country and there have been lots of changes taking place around the world. The major change implemented in the recent past is virtual banking. Objectives of the study have threefold *firstly*, to identify the level of virtual banking service quality offered by commercial banks in Trincomalee district, *secondly*, to identify the level of customer satisfaction of virtual banking of commercial banks in the district, *thirdly*, to examine how virtual banking service quality influence on customer satisfaction of commercial banks in the district. The survey was conducted within the customers of commercial banks in the district who have virtual banking connections. Primary data were assembled through a set of questionnaires issued to customers and 390 respondents were selected as a sample for this survey by using convenience sampling method. There were six hypotheses developed to evaluate the impact of customer perception in relation to virtual banking. Data were analysed with the help of descriptive, bivariate and multivariate analysis. Results show that the level of virtual banking service quality as well customer satisfaction of virtual banking of commercial banks are higher level in the district. The empirical findings concluded that virtual banking

service quality has a positive influence on customer satisfaction. Further, it emphasizes that privacy, fulfilment and responsiveness are having greater influence on customer satisfaction of virtual banking in Trincomalee. Nevertheless, efficiency, system availability and compensation are not significantly influenced on customer satisfaction. Moreover, compensation does not reflect a valuable relationship with customer satisfaction. The study has given a model to understand the real influence of virtual banking service quality on customer satisfaction and needful recommendations are also discussed.

Keywords: e-Banking, e-Customer Satisfaction, Service quality, Virtual Banking

1. INTRODUCTION

Every industry spots light that good service quality is the key success of bringing better customer satisfaction. It is not exceptional to banks as banks are the financial service providers and their success depends on the amount of service quality offered to customers (Andaleeb, Rashid, & Rahman, 2016). The financial world is eager to capture the new developments in virtual banking since they have experienced that it has a huge influence on the financial performance of the economy in developed countries (Cajetan, 2018). Virtual banking means that customers can open accounts, deposit money, obtain loans, and perform other banking services through web, email, mobile app and ATM without visiting a physical bank (Li & Zhong, 2005; Steven, 2002). Banks offer virtual banking services via electronic channels to cope up with incredible changes in the competitive world.

E-banking users not only expect the online process of banking but also, they expect better service, good customer experience, brand name, product strength (Barquin & Vinayak, 2015). As a service sector, consumers are the major stakeholders of banking industry (Islam & Niaz, 2014). Managing customers with extreme levels of satisfaction helps to retain the customers and survive the banking industry for many years in the competitive environment by maintaining a gainful relationship with customers rather than providing just a product or service (Alfrin, 2012).

Banks adopt virtual banking as it diminishes the operational cost of banks. Similarly, customers also desire it as it provides secured quick service in whole days. Further, service quality of online banking enhances the satisfaction level of existing customers as well as potential customers (Cajetan, 2018). Therefore, presently banks concentrate to generate perceived service quality to customers through virtual banking services to retain them with satisfaction (Andaleeb et al., 2016).

In the meantime, banks in emerging countries like Sri Lanka also step forward into this concept with the growth of dimensions in virtual banking services and it has been penetrating in different market segments with competitive and innovative features to enhance the competitive advantage. All commercial banks are offering almost the same products and services with little differences in Sri Lanka. The time is emerging to enlighten the importance of digital banking to customers as it is identified as an important tool to maintain close and stable relationships with the customers. Banks have to take initiatives to identify the customer preferences and take necessary actions to deliver quality services which can provide extreme customer satisfaction and loyalty (Zeithaml, Parasuraman & Malhotra, 2000). Therefore, Sri Lankan banks invest more on electronic banking modernization, implementing new strategies and various marketing efforts to upgrade the service quality of online banking (Albert, Goes, & Gupta, 2004).

Most of the Sri Lankan commercial banks' annual reports reveal that the customer's tendency to move towards digital banking is continuously increasing within the recent years. Some of the extractions are subsequently highlighted as evidence. Details were extracted from Bank of Ceylon (2017), "Customers registered for Smart passbook 41,567", "67% growth observed on e-statement registration", "Bank has invested 3.6Bn in the development of physical and digital infrastructure", "62.9Mn ATM transactions recorded". As per Hatton National Bank PLC (2017), "Online transaction value increased to 23.8% and an increase of 31.9% observed in online transaction numbers validity", "Out of the total withdrawals 82.5% of withdrawals were carried out through ATM network", "HNB has invested 632 Million in technology". Moreover, according to Commercial Bank of Ceylon PLC (2017), "86,662 customers enrolled for e-passbook", "There is a growth of 16.44% observed in online banking users and 25.90% of growth identified in mobile banking usage", "Online banking customers increase to over 800,00".

Though banks in Sri Lanka invested a large amount in the infrastructural development of technological DNA still a significant segment of people prefer the old-fashioned banking. Especially the people in rural areas still believe that cash is the preferred option to do transactions. According to 2018 statistics, the proportion of people living in urban areas in Sri Lanka is just 19% and the remaining people are in rural areas. They are still expecting the face-to-face interaction and beyond the screen relationship. Thus, the recent fully pledged paperless digitized convenient mobile APPs launched by Sri Lanka Commercial Banks within the recent two years (FriMi – NTB, FLASH-Commercial Bank of Ceylon PLC, NDB neos – NDB) could not reach the entire customers. The market is penetrating to digitalization however the move is slow compared to the technophobic countries (Euromoney, 2019).

On the other hand, Jayasiri and Weerathunga (2008) and Premaratne and Gunatilake (2016) pointed out that online banking usage is very low level in spite of literacy level and technology adoptions which were comparatively high in Sri Lanka. In 2020, CBSL states that out of the 23Mn debit cards issued in the market just 15% of cards are in the circulation of making payments. This highlighted that the majority of the public know the usage of virtual banking though they are reluctant to perform all the transactions through virtual banking due to privacy and security issues.

The user habit and behaviour of the public is identified as the main barrier for adopting digital banking since, they are struggling to change their conventional banking aspects due to there is a huge difference to perceive the service quality through web based virtual banking which is entirely different from the traditional banking (Alsajjan & Dennis, 2010). Furthermore, some of the customers have reported displeasure of online banking in Sri Lanka such as unable to reach call centres immediately, security issues, applications are designed in English, issues in withdrawing cash in ATM amongst others, albeit there are advantages in virtual banking. Moreover, the Central Bank of Sri Lanka (2020) declared 2020 as the year of digital transaction in order to minimize the usage of cash where WHO revealed that currency notes can carry Coronavirus.

Hence, identifying the problems associated with the usage of virtual banking service quality of commercial banks in Sri Lanka is utmost important to safeguard the data, identify the virtual banking process in the country, customer satisfaction level towards virtual banking and to take care of the wealth of customers which directs to customer satisfaction. A very few research studies were conducted in the topic of customer perception towards virtual banking service quality in Sri Lanka did not not touched the entire virtual banking concept. It is difficult to conduct the research considering the entire country within the limited time. Therefore, selecting a district which represents the whole country in all aspects like people with cultural differences, various economic scales, different educational backgrounds, proportion of technological acceptance, the recent developments in the banking environment and the lack of empirical studies in the geographical area have led to conduct the research in Trincomalee district. Furthermore, it attempts to fill the gap by adding empirical evidence with the existing body of knowledge about how virtual banking service quality influences customer satisfaction of commercial banks in Trincomalee district. Objectives of the research are as follows,

- To identify the level of virtual banking service quality offered by commercial banks in Trincomalee district.
- To identify the level of customer satisfaction of virtual banking of commercial banks in Trincomalee district.

- To examine how virtual banking service quality influences customer satisfaction of Commercial banks in Trincomalee district.

The remainder of the paper commences with reviewing trends in virtual banking. This is followed by methods of the research are given. Pen ultimately, results are discussed. Finally, conclusions, implication of the study and future research opportunities are presented.

2. LITERATURE REVIEW

2.1. Theoretical background for virtual banking

Various customer perceptions of adoption and acceptance of virtual banking are dramatically focused by researchers as it highly influences on the customer attitudes, user behaviour and customer satisfaction. Theoretical approaches have been used by many scholars to investigate the acceptance and adoption of technology usage which is very relevant to predict the relationship of customer attitude and belief in virtual banking. The most accepted theories are Technology Acceptance Model (TAM), Theory of Planned Behaviour (TPB), Innovation Diffusion Theory (IDT) and Theory of Reasoned Action (TRA).

Out of these, TAM has been proved that this is the widely accepted theory to predict technology adoption behaviour which is related to the variables of perceived usefulness and perceived ease of use (Chaouali et al., 2016; Mital et al., 2018). However, some studies based on this model proved that this model has to extend due to its insufficient guidance in network influences and securities in e-banking (Koo et al., 2015). TPB is used to predict the intention of an individual's behaviour which is influenced by the attitude of the user. IDT consists of five characteristics of innovations that are affecting their diffusion. Those characteristics are, relative advantage, compatibility, complexity, trial-ability, and observability (Shy, 1997; Dandago & Rufai, 2014).

The integration of TAM, TPB and IDT is best suited to examine the virtual banking services as acceptance and process of technology adoption have been proved in several researches (Awa et al., 2015; Motak et al., 2017; Chen, 2016). While several indicators are derived from the above three theories, some other e-service qualities and customer satisfaction variables are also taken into consideration as this study focuses to gain in depth understanding of the phenomenon between service quality and customer satisfaction pertaining to virtual banking services.

2.2. Virtual Banking

Virtual banking can explain the offering of banking services to the customer's door step through electronic devices in a secured and fastest way (Shahriari, 2014). Customers can perform innovative services through digital platforms which leads to better experiences. It can deliver better quality services to cater the customer aspirations by fastest and convenience transactions 24/7 access. This can fulfill unmatched customer satisfaction than the traditional banking system and routed to long term customer relationships by providing accurate information (Nupur, 2010). Mobile stats of the US reveal that 89% account holders use mobile to manage their accounts and just 20% of consumers are still visiting the branch premises. Banks from time to time introduce new developments in virtual banking products and services for changing behaviour of customers and try to retain the existing customers and attract untapped customer segments (Nimako, Gymfi & Wandaogou, 2013; Priyanath, 2018).

2.3. Customer Satisfaction

The overall experience of the customer about a product or services they purchase compared with their expectation is known as customer satisfaction. Kottler (2000) defined customer satisfaction as "a person's feelings of pleasure or disappointment resulting from comparing a product's perceived performance or outcome in relation to his/her expectations". Customer satisfaction is an important tool used by the banks for stand out for years by delivering pleasurable customer experience in the competitive market. Customers expect a consistent experience through Omni channels and it's the bank's responsibility to deliver the services without resistance. Though banks introduce new products, customers concern how they respond to them and how they solve the problems in relation to the services they access.

SERVQUAL model, introduced by Parasuramn, Zeithmal and Berry (1985), was used to analyse the gap between customer's expectations and customer's perception. Tangibility, reliability, responsiveness, empathy, assurance are the service quality dimensions identified through the SERQUAL model. Customer satisfaction is about a firm's service quality which can be evaluated by comparing customer's expectation and customer's perception of the actual services delivered to the customers. If perception exceeds the customer expectation this is considered as ultimate customer satisfaction. Different models were applied by scholars to understand the customer satisfaction in various contexts. However, in this study it is more appropriate to use a customer satisfaction model developed by Chen, Hsiao & Hwang (2012) to evaluate customer satisfaction based on the dimensions content, accuracy, ease of use, timeliness and safety due to the problems analysed in related to customer perception of virtual banking acceptance.

2.4. Virtual banking service quality and customer satisfaction

Virtual banking service quality is explained by the overall judgment of the quality of services consumed by the customers through the digital banking network (Zeithaml et al., 2002; Amin, 2016). E-satisfaction is the pleasant and positive experience of the customer from the E-service delivery of the banks and financial institutions. Service quality and web site designs are the main two factors that influence e-customer satisfaction (Kim, 2005). This research is trying to find out to what extent the quality of virtual banking services offered by banks would contribute to the satisfaction level of customers based on customer's perception of Trincomalee. Several researches carried out in various countries to find the relationship between e-banking service quality and customer satisfaction in different perspectives.

According to the research conducted in Pakistan on impact of e-banking on customer satisfaction based on the key dimensions of SERQUAL model and emphasizes that people evaluate e-banking service quality mainly on three key dimensions: Responsiveness, Reliability and Assurance (Toor et al., 2016). Some researchers pointed out those e-banking services help to retain customers with good customer satisfaction (Martins et al., 2014). Ranaweera and Neely (2003) stated that E-service quality is the initial step which develops customer satisfaction. A research carried by Adil (2013) verified that quality services retain the customers with the bank and illustrated there is a direct relationship between electronic service quality and customer satisfaction.

In Sri Lanka, most of the previous researches focused on the customer satisfaction only for the usage of internet and mobile banking. There are several researches conducted to identify the factors influencing the adoption of internet banking (Jayasiri, Gunawardana & Dharmadasa, 2016), mobile banking and the impact of internet banking on customer satisfaction (De Silva & Abeysekara, 2012). However, these researches do not consider the entire virtual banking services provided by banks and to analyse how these service qualities impact on customer satisfaction. Tharnikaran et al. (2017) conducted within the e-banking users who have accounts in licensed commercial banks in Batticaloa district to identify the customer satisfaction considering the e-service quality dimensions: efficiency, system availability, fulfilment, privacy, responsiveness, compensation.

Table 1: E-service dimensions used in different contexts

Authors	Dimensions	Context
Yoo and Douthu (2001)	Ease of use, aesthetic design, processing speed, and security (SiteQual)	Online retailing
Parasuraman et al. (2005)	Efficiency, system availability, fulfillment, privacy, responsiveness, compensation and contact (E-S-Qual and e-RecS-Qual)	E-service
Akinci and Aksoy (2010)	Based on Parasuraman et al. (2005) e-service quality model: efficiency, system availability, fulfillment, privacy, responsiveness, compensation and contact (E-SERVQUAL)	E- banking
Zavareh et al., (2013)	Assurance, fulfillment, efficiency, system availability, privacy, contact-responsiveness, and website aesthetics and guide	E Banking
Amin (2016)	Personal Need, Site organization, User Friendliness, Efficiency of website	Internet Banking
Toor et al., (2016)	Dimensions of SERVQUAL Model Reliability, Responsiveness, Assurance, Tangibles, Empathy	E- banking
Tharanikaran et al., (2017)	Efficiency, system availability, fulfillment, privacy, responsiveness, compensation and contact	E-banking
Priyanath, (2018)	E-service quality model: efficiency, system availability, fulfillment, privacy, responsiveness, compensation and contact	Internet Banking
Zhou et al., (2019)	Functional completeness, performance, interface and interaction quality, content and information, support or service	E- services in telecom
Sathiyavany and Shivany (2018)	Website design, Content, E-trust, E-convenience, E- cost effectiveness, E-response/Support	E-banking
Aruna (2019)	Accessibility, Awareness, Bank functions, Cost, Ease of Use	Internet Banking

Source: Author Constructed

As per the Table 1, numerous models were developed by various scholars to evaluate the e-service quality in different countries with different perspectives and it has been found that E- SERVQUAL developed by Parasuraman (2005) is identified as the best model to suit the analysis of e-service quality since it is the conjuncture of two different models of E-S-QUAL (dimensions of

efficiency, fulfilment, system availability and privacy) and E-Rec-S-QUAL (Dimensions of Responsiveness, compensation and contact) which has been used and accepted by many researchers to test the e-service quality. Hence, this research also tries to examine the virtual banking service quality by considering the e-service quality dimensions to obtain best understanding.

3. METHODOLOGY

A positivist perspective was applied to identify how virtual banking services offered by banks influence customer satisfaction in Trincomalee district through the customer's perceptions.

3.1. Conceptual Framework of the research

Conceptual Framework of the study is shown in Figure 1.

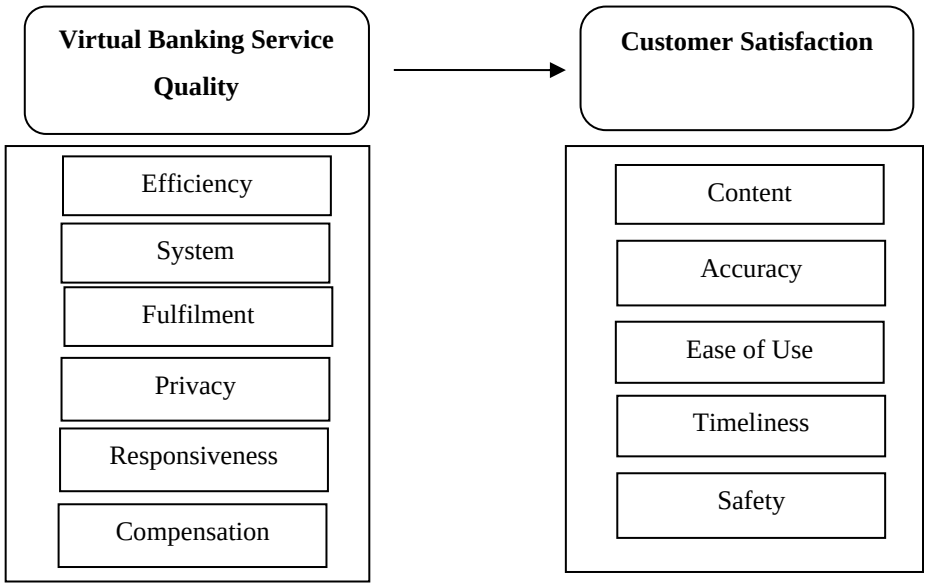

Figure 1: Conceptual Framework of the research

Source: Parasuraman et al., 2005; Chen et al., 2012

Efficiency: The ability of accessing the system easily and trying to find out the preferred services and information without spending too much time and struggle (Zethaml et al., 2002). Previous studies highlighted that efficiency has a significant impact on customer satisfaction (Akinci et al., 2010;

Herington and Weaven, 2009; Zethaml et al., 2002; Priyanath, 2018). Therefore, the following hypothesis is formulated.

H1: There is a significant positive relationship between efficiency and customer satisfaction in virtual banking of commercial banks in Trincomalee district.

System availability: How the website or system is organized for business with correct technical functions and the operating ability of the website. Zeithaml et al. (2000), Ling et al. (2015), Zeithaml et al. (2002), Priyanath (2018) concluded that system availability enhances the customer satisfaction. Therefore, the relevance of system availability in virtual banking hypothesis as follows.

H2: There is a significant positive relationship between system availability and customer satisfaction in virtual banking of commercial banks in Trincomalee district.

Fulfilment: Ability to offer promised services consistency with the same expected standards which fulfil the expectations of customers within a time frame (Zethaml et al., 2002). Fulfilment has been identified as an essential predictor for customer satisfaction (Toor et al., 2016; Nupur, 2010; Akinci et al., 2010). Hence, this research study hypotheses that,

H3: There is a significant positive relationship between fulfilment and customer satisfaction in virtual banking of commercial banks in Trincomalee district.

Privacy: Data governance and data security assures safety transactions and brings trust to customers that banks have the ability to maintain their financial and personal information confidentiality (Ling et al., 2015). Previous research emphasized that privacy has a positive influence towards customer satisfaction (Tharanikaran, 2017). Hence, the following hypothesis is presented.

H4: There is a significant positive relationship between privacy and customer satisfaction in virtual banking of commercial banks in Trincomalee district.

Responsiveness: The tendency of responding customers immediately in order to provide timely services (Parasuraman et al, 1988). Several researchers concluded that responsiveness has the ability to exceed the level of customer satisfaction (Sakhaei et al., 2014; Zeithaml et al., 2002; Nupur, 2010; Toor et al., 2016). Hence, the relevance of responsiveness hypothesis that,

H5: There is a significant positive relationship between responsiveness and customer satisfaction in virtual banking of commercial banks in Trincomalee district.

Compensation: The bank's ability to compensate the losses occurred to the customers due to inconvenience and unexpected problems that arise while performing transactions through digital channels (Kumbhar, 2011). It has been proved in several researchers (Parasuraman et al., 2005; Akinci et al., 2010; Tharanikaran et al., 2017; Priyanath, 2018). Therefore, the following hypothesis has been developed,

H6: There is a significant positive relationship between compensation and customer satisfaction in virtual banking of commercial banks in Trincomalee district**.**

3.2. Sampling and Data analysis

3.2.1. Population and sampling

The population selected for this study was the customers who enjoy any mode of virtual banking services provided by state and private sector commercial banks in Trincomalee district. Krejcie and Morgan (1970) (cited in Sekaran, 2007, p.294) stated that a maximum 384 respondents are sufficient to conduct a large population. By considering the argument, 390 customers who have virtual banking connections in various commercial banks of Trincomalee were selected as a sample. Convenience sampling was used to select the respondents due to the difficulty of obtaining details of virtual banking customers from the banks in Trincomalee.

3.2.2. Data Collection and Analysis

It was a quantitative research where primary data were gathered through a set of questionnaires and measured by using a 5-point Likert scale. Secondary data were gathered through the banks' websites by referring to the annual reports and related publications. SPSS version 22 was used to analyse the data. Descriptive analysis, Pearson's correlation and multiple regression were used to analyse the primary data collected from the respondents. The descriptive analysis has considered being most appropriate to evaluate the variables based on individual responses which include percentages, mean value and standard deviation. The mean value (X) ranges and decision attributes are as follows,

$1.0 \leq X < 2.5$ Lower level
$2.5 \leq X < 3.5$ Moderate level
$3.5 \leq X \leq 5.0$ Higher level

4. DATA ANALYSIS AND FINDINGS

4.1. Reliability Test

Total of 413 filled questionnaires received. Out of that only 390 were completely fit to use this research study, the rest of the 23 were incomplete. Cronbach's alpha reliability test was carried out to evaluate the internal reliability of the items measured. The overall Cronbach's value is found as 0.919 (Table 2) and it suggests a strong reliability according to George and Mallery (2003).

Table 2: Reliability Test

	Cronbach's Alpha	No of Items
Total Reliability	0.919	38

Source: Survey data, 2019

4.2. Univariate Analysis

4.2.1. Respondents by Banks

Table 3 reveals that customers having virtual banking connections with private and government sector banks in Trincomalee district were selected as respondents for the purpose of this study. Out of this 390 customer's majority of the respondents are dealing with the two state banks with 41% due to most of the government employees' salaries are directed to these banks. Followed to this, two main private sector banks Commercial bank of Ceylon and Hatton National Bank are 18% and 13% respectively. Rest of the 38% respondents are dealing with all other remaining banks.

Table 3: Respondents by Banks

Bank	**Frequency**	**Percent**
Hatton National Bank	49	13.0
Commercial Bank	72	18.0
BOC	92	24.0
People's Bank	65	17.0
Sampath Bank	35	9.0
Seylan Bank	25	6.0
NDB	22	6.0
DFCC	9	2.0
NTB	12	3.0
Others	9	2.0

Bank	Frequency	Percent
Hatton National Bank	49	13.0
Commercial Bank	72	18.0
BOC	92	24.0
People's Bank	65	17.0
Sampath Bank	35	9.0
Seylan Bank	25	6.0
NDB	22	6.0
DFCC	9	2.0
NTB	12	3.0
Others	9	2.0
Total	**390**	**100.0**

Source: Survey Data, 2019

4.2.2. Most preferable virtual banking channel

Table 4 indicates that 41% of respondents prefer ATM networks, 29% of customers prefer internet banking and 28% of respondents prefer mobile banking. Almost all customers give the same preference to internet banking and mobile banking.

Table 4: Most preferable digital banking channel

Virtual banking channel	Frequency	Percent
Internet banking	112	29.0
Mobile banking	109	28.0
ATM	160	41.0
Others	9	2.0
Total	**390**	**100.0**

Source: Survey Data, 2019

4.2.3. Mostly carryout virtual banking services

As per the Table 5, Most of the respondents are inquiring account balances (20%), view transaction details (18%), performing fund transfers (20%) and withdrawing cash (19%) by using ATM machines. Respondents have shown a lesser interest in paying utility bills through digital banking (10%) and performing online purchasing transactions (10%) due to security concerns and non-real time updates. The participants using digital access for account opening and loan processing is comparatively below average and it's just 3%. For account opening and to process a loan still customers are visiting the

branches. These results indicate that even the people who are using virtual banking are not familiar to perform all the available services and they only carry out the routine transactions.

Table 5: Mostly carryout virtual banking services

Virtual banking services	Frequency	Percent
Balance inquiry	79	20.0
Transaction history	70	18.0
Fund transfer	77	20.0
Utility bill payment	38	10.0
Online purchasing	39	10.0
Cash withdrawal	75	19.0
Account opening and loan processing	12	3.0
Total	**390**	**100.0**

Source: Survey Data, 2019

4.2.4. Descriptive Analysis of Research information

Table 6 shows that the highest mean value extracted for each service quality dimension and customer satisfaction dimensions indicate that overall virtual banking service quality is highly perceived by the customers in Trincomalee district and they are fairly satisfied with the usage of virtual banking. Banks have to concentrate more on system development since the mean value is in a moderate level.

Table 6: Descriptive Analysis of Research information

Virtual Banking Service quality	Mean	Std. Deviation	Customer Satisfaction	Mean	Std. Deviation
Efficiency	3.63	0.63	Content	3.83	0.86
System Availability	3.34	0.73	Accuracy	3.79	0.74
Fulfilment	3.50	0.67	Ease of use	4.00	0.72
Privacy	3.67	0.76	Timeliness	3.78	0.78
Responsiveness	3.59	0.69	Safety	3.72	0.75
Compensation	3.78	0.71			

Source: Survey data, 2019

4.3. OLS Assumptions: Multi-collinearity Test

The multi collinearity issue was checked between the independent variables and the dependent variable of customer satisfaction as shown in Table 6 and found the VIF value of less than 0.5 and the tolerance value which is higher than 0.2 indicate there is no severe multicollinearity problem among the variables (Table 7)**.**

Table 7: Multi-collinearity test

	Collinearity Statistics	
	Tolerance	**VIF**
Efficiency		
System Availability	0.338	2.963
Fulfilment	0.614	1.628
Privacy	0.363	2.756
Compensation	0.410	2.440
Responsiveness	0.955	1.047
	0.428	2.336

a. Dependent Variable: Customer satisfaction

Source: Survey data, 2019

4.4. Correlation Analysis

According to Table 8, efficiency is positively correlated with customer satisfaction in virtual banking (r=0.508) at the level of 0.01. Relationship between System availability and customer satisfaction in virtual banking is a weak positive as Pearson correlation value is less than 0.5 (r=0.377) at the 5% significance level. Fulfilment has a significant relationship with customer satisfaction in virtual banking at the significant level of 0.01. The Pearson correlation value 0.537 is higher than 0.5 depicting that a significant moderate positive linear relationship between fulfilment and customer satisfaction in virtual banking. The correlation between privacy and customer satisfaction reported as 0.579, ($r>0.5$) and the significance value $p<0.05$ are expressing a positive significant linear correlation between privacy and customer satisfaction in virtual banking. The correlation analysis for responsiveness and customer satisfaction in virtual banking portrays a weak positive relationship where the Pearson correlation is 0.493 which is less than 0.5 and significance value is below 0.05. The correlation between compensation and customer satisfaction on virtual banking is lower than 0.5 (r=0.068) which is illustrating a weak positive relationship whereas the significance level is 0.179 which is higher than 0.05 ($0.179=P>0.05$) represents that it cannot be generalized. The overall predictability of the correlation between virtual banking service quality and the level of customer satisfaction is depicting that 0.6, which is a moderate positive significant linear relationship at 5% significant level in Trincomalee district.

Table 8: Correlation Analysis between Virtual Banking and Customer Satisfaction

Independent Variables	Customer satisfaction (N=390)	
	Pearson Correlation	Sig. (2-tailed)
Efficiency	0.508**	0.000
System Availability	0.377**	0.000
Fulfilment	0.537**	0.000
Privacy	0.579**	0.000
Responsiveness	0.493**	0.000
Compensation	0.068	0.179
Overall Virtual Banking Service Quality	0.600**	0.000

**Correlation is significant at the 0.01 level (2-tailed).

Source: Survey data, 2019

4.5. Regression Analysis

As per the Table 9, simple regression is shown from Model 1 to Model 6. Except compensation, all other dimensions positively influence customer satisfaction. According to the result of multiple regression model 7 in Table 9, the 'F 'value of 41.708 conveys that data used in the model is best fit to explore the influence of virtual banking service quality on customer satisfaction as the significance value is 0.000.

The value of R square is 0.395 explaining that based on the selected sample of the survey, 39.5% variation of dependent variables of customer satisfaction in virtual banking can be explained by the independent variable of virtual banking service quality. Adjusted R square 0.386 conveys the independent variables of digital banking service qualities that explain 38.6% of the dependent variable of customer satisfaction in virtual banking of Commercial Banks in Trincomalee district. It proves that more than the virtual banking service qualities tested in this research, some other dimensions are also influencing customer satisfaction in respect of virtual banking in Trincomalee district. It also illustrates how far the virtual banking service quality dimensions of efficiency, system availability, fulfilment, privacy, responsiveness and compensation are having influence on the level of customer satisfaction.

The significant value is below 0.05 for privacy, responsiveness and fulfilment indicate a significant positive impact on customer satisfaction on virtual banking. Out of these three variables privacy highly influences on customer satisfaction of virtual banking services. Next, Responsiveness is also having a

high impact on customer satisfaction. Other three virtual banking service quality dimensions namely efficiency, system availability and compensation are having the significant value above 0.05 reveals that these variables do not have a significant impact on customer satisfaction.

Table 9: Regression Analysis

Independent Variables	Dependent Variable - Customer Satisfaction						
	Separate Regression						Multiple Regression
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
B	2.534 0.000 [0.112]	3.064 0.000 [0.097]	2.581 0.000 [0.101]	2.597 0.000 [0.089]	2.702 0.000 [0.102]	3.663 0.000 [0.121]	2.045 0.000 [0.143]
Efficiency	0.355* 0.000 [0.031]						0.055 0.251 [0.048]
System Availability		0.227* 0.000 [0.028]					0.017 0.586 [0.031]
Fulfilment			0.350* 0.000 [0.028]				0.087* 0.047 [0.043]
Privacy				0.334* 0.000 [0.024]			0.202* 0.000 [0.036]
Responsiveness					0.312* 0.000 [0.028]		0.093* 0.016 [0.039]
Compensation						0.042 0.179 [0.031]	0.045 0.075 [0.025]
F	135.248	64.215	156.833	196.017	124.445	1.810	41.708
Sig.	(0.000)	(0.000)	(0.00)	(0.000)	(0.000)	(0.179)	(0.000)
R	0.508	0.377	0.537	0.579	0.496	0.068	0.629
R Square	0.258	0.142	0.288	0.336	0.243	0.005	0.395
Adjusted R Square	0.257	0.140	6	0.334	0.241	0.02	0.386

P- values are shown in parentheses and standard errors are reported in square brackets

Source: Survey data, 2019

In respect of the above results, the regression equation could be written as follows.

CS = 2.045 + 0.055E + 0.017SA + 0.087F + 0.202P + 0.045C + 0.093R + e

Where,

CS	-	Customer Satisfaction on virtual Banking
E	-	Efficiency
SA	-	System Availability
F	-	Fulfilment
P	-	Privacy
C	-	Compensation
R	-	Responsiveness
e	-	Error term

The equation indicates that the constant static 2.045 units show that the model can predict when all the independent variables were zero. When Fulfilment increases by one unit, customer satisfaction will be increased by 0.087 units as average. When Privacy increases by one unit, customer satisfaction will be raised by 0.202 units as average. Similarly, other dimensions could be explained.

4.6. Hypothesis Test

H1: There is a significant positive relationship between efficiency and customer satisfaction in virtual banking.

The multiple regression analysis portrays the significance value as 0.251 (0.251>0.05, (p<0.05) indicating there is no positive significance relationship between efficiency and customer satisfaction on virtual banking. However, Pearson's correlation analysis coefficient is 0.508 which is significant at the level of 5% (p=0.000) illustrates a positive significant relationship between efficiency and customer satisfaction. Therefore, accepts the hypothesis H1 as per the correlation result.

H2: There is a significant positive relationship between system availability and customer satisfaction in virtual banking.

The multiple regression analysis portrays the significance value as 0.586 (0.586>0.05, (p<0.05) indicating there is no positive significance impact of system availability on customer satisfaction pertaining to virtual banking. However, Pearson's correlation analysis, the coefficient is 0.377 which is significant at the level of 5% (p=0.000) illustrates a positive significant relationship between system availability and customer satisfaction. Thus, as per the correlation result hypothesis H2 has been accepted.

H3: There is a significant positive relationship between fulfilment and customer satisfaction in virtual banking.

As per Pearson's correlation analysis the coefficient is 0.537 which is significant at the level of 5% (p=0.000) illustrates a positive significant relationship between fulfilment and customer satisfaction. According to multiple regression analysis the significance value is 0.047 which is less than 0.05 is also indicating a significance impact of service quality dimension of fulfilment on the two variables. Therefore, accepts the hypothesis H3.

H4: There is a significant positive relationship between privacy and customer satisfaction in virtual banking.

As per Pearson's correlation analysis the coefficient is 0.579 which is significant at the level of 5% (p=0.000) illustrates a positive significant relationship between privacy and customer satisfaction. Based on the results of multiple regression analysis the significance value is 0.000 which is less than 0.05 also indicating a significance relationship between the two variables. Therefore, accepts the hypothesis H4.

H5: There is a significant positive relationship between responsiveness and customer satisfaction in virtual banking.

According to Pearson's correlation analysis the coefficient is 0.493 which is significant at the level of 5% (p=0.000) illustrates a positive significant relationship between responsiveness and customer satisfaction. Based on the results of multiple regression analysis the significance value is 0.016 which is less than 0.05 also indicating a significance relationship between the two variables. Therefore, accepts the hypothesis H5.

H6: There is a significant positive relationship between compensation and customer satisfaction in virtual banking

As per the Pearson's correlation analysis the coefficient is 0.068 which is not significant (p=0.179>0.05) illustrates there is no relationship between compensation and customer satisfaction. The multiple regression analysis also portrays the significance value as 0.075 (0.075>0.05, (p<0.05) indicating there is no positive significance impact on compensation and customer satisfaction on virtual banking. Therefore, hypothesis H6 has been rejected.

5. DISCUSSION

Statistical analysis proved that virtual banking service quality has influenced customer satisfaction in Trincomalee district. The previous studies (Sharma & Malviya, 2014; Toor et al., 2016; Kaura et al., 2015) also have proved the same. In addition, it has been noticed that each and every service quality dimension identified in this research has a positive significant relationship

with customer satisfaction except compensation. Out of the six service quality dimensions privacy, fulfilment and responsiveness are highly significant with customer satisfaction. Efficiency and system availability have proved less significant relationship. However, compensation has not produced a significant relationship with customer satisfaction of commercial banks in Trincomalee district. Compared to the other dimensions, privacy is statistically more significant and has a greatest positive relationship with virtual banking customer satisfaction. Responsiveness has a significant positive relationship with customer satisfaction. Previous studies (Sakhaei et al., 2014; Zeithaml et al., 2002; Nupur, 2010; Toor et al., 2016) also pointed out that responsiveness has an influence on customer satisfaction. Statistical results of fulfilment also have a major influence on customer satisfaction on virtual banking. The bank's ability to deliver right services consistency on right time with data accuracy to fulfil the customer's expectation is known as fulfilment. Findings in previous researches (Toor et al., 2016; Nupur, 2010; Akinci et al., 2010) are consistent with the present study.

Efficiency, system availability and compensation have not proved significant influence on customer satisfaction in Trincomalee district in the multiple regression. However, previous studies summarized that there was a significant linear relationship between the two variables (Herington & Weaven, 2009; Zethaml et al., 2002). Ling et al. (2015) and Zeithaml et al. (2002) found that system availability has a significant effect on customer satisfaction in virtual banking whereas the current study reveals that system availability has less significance with customer satisfaction in virtual banking in Trincomalee district.

Further, Prior researches (Parasuraman et al., 2005; Tharanikaran et al., 2017) illustrated that compensation is also having a positive impact on customer satisfaction. In contrast, the current study conducted in Trincomalee concluded that there is no significant relationship between compensation and virtual banking customer satisfaction.

6. CONCLUSIONS

The study found that ATM, Internet banking and Mobile banking are highly accepted by the customers in Trincomalee district and most of them are utilizing the routine transactions rather than performing all types of virtual transactions. Conclusion for each objective is subsequently presented.

First objective is to identify the level of virtual banking service quality of commercial banks in Trincomalee district. The state of virtual banking service quality measured through the e- service quality dimension of efficiency, system availability, fulfilment. Privacy, responsiveness and compensation and

several indicators were identified under each dimension to analyse the level of service quality. The highest mean value arrived for compensation and continuously privacy, efficiency, responsiveness, fulfilment are in line with higher mean. However, the mean value extracted for system availability is in a moderate level. Results indicate that overall virtual banking service quality is higher in relation to customer's perception.

Second objective is to identify the level of customer satisfaction of virtual banking of commercial banks in Trincomalee district. In order to identify the customer satisfaction level selected sample were asked questions based on the customer satisfaction dimension of content, ease of use, accuracy, timeliness and safety. The mean and standard deviation calculated for each dimension through descriptive analysis illustrates that all five variables are having a high mean value and explains that the customers of commercial banks in Trincomalee district are satisfied with the usage of virtual banking. Ease of use has a highest mean and influencing higher on customer satisfaction with the rest of the four dimensions.

Third objective is to examine how virtual banking service quality influence the customer satisfaction of commercial banks in Trincomalee district. It is concluded that there is a significant relationship between virtual banking service qualities and customer satisfaction of commercial banks in Trincomalee district. Privacy, fulfilment and responsiveness are influenced on customer satisfaction whereas efficiency, system availability and compensation are not significantly influenced on customer satisfaction and compensation is not reflected in a valuable relationship with customer satisfaction in Trincomalee. Moreover, it can be concluded that customers of Trincomalee perceive the virtual banking service quality mostly by privacy, fulfilment and responsiveness. Privacy is the most significant factor perceived by customers to concentrate more on customer satisfaction in virtual banking. Therefore, the study is conveying that better service quality improvements enhance better customer satisfaction.

7. POLICY IMPLICATION

Findings help the banks to identify the real perception of virtual banking by customers and identify the factors by which banks can improve virtual banking service quality which has a huge influence on the customer satisfaction as well as reduces the operational cost and consequently increase the profitability of banks. In addition, it is useful to find out the reasons in customers' perspective why the entire market is still reluctant to move towards electronic channels. Findings of the study provide better solutions to the management of banks how more customers could be attracted while it

provides valuable information to policy makers to design virtual financial systems.

8. DIRECTION TO FUTURE RESEARCH

The study was conducted to identify the customer satisfaction based on virtual banking service quality through customer's perception only in Trincomalee. Therefore, future research is needed to extend the Eastern province as well as the whole country to identify the actual trend of virtual banking service quality and customer satisfaction for better understanding. Secondly, another study could be conducted on the impact of virtual banking on financial performance of banks. Thirdly, qualitative study also could be undertaken to gain more insight of customers pertaining to virtual banking.

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POTENTIAL FOR COMMERCIALIZATION OF APICULTURE AS A BIOFIN LIVELIHOOD OPTION IN ANURADHAPURA DISTRICT, SRI LANKA

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ABSTRACT

Apiculture is the scientific management of honeybees, which provides an environmentally friendly livelihood option. The honeybees play a key role in the ecosystems by supporting to pollination and food production. However, modern agricultural practices have threatened the survival of honeybees. Therefore, conservation, rearing, and management have been taken due attention. The study was carried out to assess the suitability of apiculture as a (Biodiversity Finance –BIOFIN) livelihood option and to design a value chain for the community in the *Anuradhapura* district. The study used a randomly selected sample of 130 respondents representing 50 beekeepers from *Bandarawela* to study the existing bee honey value chain, 50 fruit or vegetable farmers in *Palugaswewa*, and 30 value chain actors for the analysis. The data collection was done using a pretested structured questionnaire. Binary logistic regression was used to identify the factors affecting farmers' willingness for apiculture. Further, SWOT analysis and value chain analysis were conducted. The regression results revealed that land size (p=0.015), and credit access (p=0.041) have positive impacts, while gender (p=0.012), has a negative impact on farmers' willingness at 5% significance level. According to the SWOT analysis, land availability and the obtainability of bee colonies are the

strengths. Among the weaknesses, the need for specific skills and low access to inputs like beehives have been identified. Moreover, the demand for dry zone bee honey was identified as an opportunity while deforestation and over-application of pesticides were identified as threats. The study finds that beekeeper – processor – local consumers are the stakeholders of the market chain for bee honey. The processors obtain the highest gross margin and market margin. Results conclude that apiculture can be used as a BIOFIN livelihood option by providing sufficient knowledge and training, developing an input supply system, introducing value addition, and marketing linkages.

Keywords: Apiculture, Bee honey, BIOFIN, Farmers' willingness, Value chain

1. INTRODUCTION

Apiculture is defined as, rearing of honeybees in a broader sense (Punchihewa, 1994). It is the way of managing and caring of honey bees in a scientific way (Sharma and Das, 2018). Bee honey, pollen, propolis, bee wax, royal jelly, bee venom, the queen, and the beehives are the major products of apiculture (Sforcin *et al*., 2017; Sharma and Das, 2018; Vapa- *et al*., 2020).

Sri Lankan context, there is a demand for natural bee honey in Ayurveda medicine, the beauty culture industry, and the food industry. Therefore, annually around 60 to 80 metric tons of bee honey is imported to Sri Lanka from Australia, India, China, and Thailand where annual local production is around 20 metric tons at present (Thambavita, 2019). Natural raw honey, value-added products like garlic with honey, cinnamon with honey, and bee balm are commonly available products in Sri Lankan supermarkets. But, only bottled natural raw honey is available in Sri Lankan retail and wholesale shops.

Apiculture is an important component in agriculture, rural employment, human nutrition, and economic development (Aiyeloja *et al*., 2015; Fels *et al*., 2019; Gratzer *et al.*, 2019). For instance, apiculture can be used as a solution for youth and women unemployment in the rural sector since apiculture can be practiced by anyone irrespective of sex and age. Furthermore, apiculture can be used as an employment opportunity for disabled people, because it does not require heavy works (An, 2015). Moreover, apiculture helps to generate employment opportunities such as the manufacturing of equipment and materials, especially the bee boxes needed for the creation of the apiary, smokers, honey extractors, selling bee colonies, and value addition (Tej *et al.*,

2017). Since Sri Lanka is one of the great tourist hotspots; apiculture can be linked with the tourism industry (Wos, 2014; Belma, 2020).

As pollinators, honey bees play a significant role in biodiversity and food production. They provide sustainable benefits to humans through pollination, helping plants grow, and producing foods. Therefore, it concludes as Honey bees are the world's most important single species of pollinators in natural ecosystems. It is estimated that one-third of food that we consume each day relies on pollination mainly by bees (FAO, 2018).

However, deforestation, crop monoculture, bee-killing pesticides, Genetically Modified Crops (GMC), climate change, and parasites are the major reasons for the decline of honeybees. On the other hand, pests i.e. wax moth, diseases i.e. American foulbrood disease, European foulbrood disease, and Chalkbrood disease are the major threats for commercialization of apiculture (Bradbear, 1988; Aronstein and Murray, 2010). The honey bee decline is directly linked with biodiversity degradation. Thus, conservation of natural honey bee population and propagation of honey bees become a timely important matter. In this regard, the promotion of apiculture and commercialization are important to conserve the natural honey bee population (Goulson *et al.*, 2015).

As a conservation strategy, the Biodiversity Finance Initiative (BIOFIN) would be a viable option to build a link between beekeeping which has an impact on biodiversity conservation and livelihood development. BIOFIN is a UNDP-managed global partnership that supports countries to enhance their financial management for biodiversity and ecosystem conservation. In the year 2012 UNDP and the European Commission launched the BIOFIN (UNDP, 2018).

Premarathne *et al.*, (2018) have proposed a model that considers economic, environmental, and social sustainability with apiculture under BIOFIN. The study highlighted the potential for promoting apiculture as a BIOFIN livelihood option by considering the country specific factors that collect through the literature. According to the suggested model, credit facilities will be offered to functioning farmer organizations (FOs). Then FOs will dissolve funds further to invest on apiculture with their members as small groups. At the end, small groups will repay the loans to the corresponding FO and ultimately FO will pay the initial loan to the respective bank. After the successful adaptation of the suggested model, it expects to protect the ecosystems while expanding biodiversity. Income gains for farmers through bee honey production and high crop yields due to enhanced crop pollination are expected through the proposed model. But the suggested model has not yet been tested for the suitability at the farmer level. The research team have recommended assessing the suitability of the model at desired areas before

implementing in their publication. Therefore, this study aimed to examine the potential for apiculture as a BIOFIN livelihood option model as suggested and the potential to establish it as a sustainable value chain.

Value chain approach is highly used in the promotion of agricultural commodities in the world (Miller and Jones, 2010; Trienekens, 2011) In this regard, National Agribusiness Development Program (NADeP) and International Fund for Agriculture Development (IFAD) have proposed a value chain by introducing Producer-Public-Private Partnership (P4) project together with one of the private sector business organization in Sri Lanka in the Uva Province for the promotion of bee honey production. There are around 600 beneficiaries, and this is the biggest honey production development project launched in Sri Lanka at present (Kumara and Prasad, 2019). Therefore, the study was carried out to find out the ways of promoting apiculture in the *Anuradhapura* district by considering the value of such initiation.

Moreover, there are a limited number of studies that have been done on both bee honey value chain and apiculture in Sri Lanka.in this background, the study focused to fill the information gap to develop a bee honey value chain and the apiculture as a BIOFIN livelihood option.

2. REVIEW OF LITERATURE

2.1. Honey bee species in Sri Lanka

Honey bees are social insects that live in colonies. Sri Lanka is home to nearly 150 species of bees and four of these species produce their own honey. They are *Apis cerana* (Asian hive honeybee), *Apis dorsata* (Giant honey bee), *Apis florea* (Dwarf honey bee), *Trigona iridipennis* (Stingless honeybee). They are called 'True Honey bees' in Sri Lanka (Karunaratne, 2004).

A. cerana is generally distributed in tropical, subtropical and temperate areas of Asia. *A. dorsata* can be found in Pakistan, through the Indian subcontinent and Sri Lanka. *A. florea* is distributed in warm areas like Pakistan, Iran, Oman, India, and Sri Lanka (Yadav *et al.*, 2017).

2.2. Apis cerana

A. cerana is Sri Lanka's indigenous species and they are commonly used in honey production because of their relatively non-aggressive nature (Jayathilaka and Mudaliyar, 1881: Punchihewa, 1994). In some parts of China and India, *A.cerana* honey is considered to be superior quality than that of *A. mellifera* (Abrol, 2013). Generally, they are called as 'Indian honeybee'

or 'Asian hive honey bee'. *A. cerana* belongs to order Hymenoptera and family Apidae. It is similar to the European honeybee: *A. mellifera*. *A. cerana* usually build their multiple combed nests in tree hollows and man-made structures.

A bee colony consists of one queen, thousands of workers, and few drones (Punchihewa, 1994; Devillers, 2002). *A. cerana* colonies consist of approximately 34,000 bees (Egelie *et al.,* 2015). Queen is the reproductive female of the colony and she has a large body with wings that covers only about two-thirds of the abdomen. She does not have structures to collect pollen or functional wax glands. The main function of the queen is to lay eggs and keep the workers uninterested in reproduction through pheromonal control. The drones are the largest bees in the colony. They do not have a sting, pollen baskets or wax glands. They are produced to mate with the queen. The workers are the smallest and the most numerous individuals in the colony. They are sexually underdeveloped females. Worker bees have specialized structures such as; brood food glands, scent glands, wax glands, and pollen baskets. They perform all hive maintenance like cleaning, foraging, tending to the brood (eggs, larvae, and pupae), and producing honey (Devillers, 2002; Egelie *et al*., 2015). Within the colony worker bees rear new queens for some reason as; the former queen left with a swarm, the queen is laying increasingly fewer eggs and the colony is overcrowded and has no space to expand. *A. cerana* has a longer daily foraging period than *A. mellifera.* Also, *A. cerana* can forage at lower temperatures (Egelie *et al.,* 2015).

2.3 Importance of honeybees

As stated by Albert Einstein, “If bees disappeared off the face of the earth, man would only have four years left to live”. It means the honey bee plays an important role in the ecosystem. In many crops, insect pollination is essential for seed production. Among the insect pollinators, bees are the most important pollinator because of their foraging behavior and constancy (Corbet and Osborne, 1991).

The majority of horticultural crops including fruits, vegetables, spices, and plantation crops depend on different kinds of insect pollinators. Absent of insect pollinators lead a 70-90 percent fruit set ranging reduction in different mango varieties. Similarly, for onion and watermelon, native honey bee species called, *A. cerana, A. dorsata,* and *A. florea* are the major pollinators (Reddy *et al.,* 2019).

2.5 Reasons for honey bee drop

Invasive species, habitat loss, climate changes, and insecticides are the major drivers of honeybee decline (Meeus *et al.,* 2018).

Pesticide-contaminated flowers affect the health of the honeybee colonies and decline their productivity (Krupke and Long, 2015). Exposure of honeybees to a sub-lethal dose of neurotoxic insecticides can cause stress, paralysis, or abnormal behavior but not kill the honeybees (Zaluski *et al.,* 2015). Neonicotinoids reduce the mating frequency of the queen and it negatively affects the genetic diversity in the colony (Nadege *et al.,* 2017). According to Williams *et al.,* (2015), contamination of neonicotinoid pesticides during colony development stage can severely affect queens.

Unfavorable weather conditions and habitat degradation which resulted due to deforestation are adversely effect on honeybees (Mustafa *et al.,* 2015). Habitat loss reduces the abundance and diversity of floral resources and nesting opportunities (Goulson *et al.,* 2015). Monoculture also leads to habitat degradation and ruin floral resources for honeybees (Nicholls and Altieri, 2013). Annual fires in some areas are considered a serious threat to honeybees and bee honey production because fire reduces the availability of floral resources. Also, during the dry season, Bush burning considerably reduces the wild bee population (Mustafa, 2015).

Pests and diseases are another major threat to honey bee drop. The wax moth is the major problem to beekeeping in Asia. Wax moth occurs because of poor management practices by the beekeeper. *Galleria mellonella* (Greater wax moth) and *Achroia grisella* (Lesser wax moth) are the major damaging wax moth species found in India. Maintaining good hygienic beekeeping practices can prevent a wax moth attack. Hive Beetle (*Aethina tumida*), ants and wasps, birds, and Indian Bear (*Melursus ursinus*) are the other minor pests of honeybees in India (Nirupama, 2018).

American foulbrood (AFB) disease, European foulbrood (EFB) disease are the dangerous bacterial diseases infecting honey bee colonies (Bradbear, 1988; Kishan *et al*., 2017). Chalkbrood is a fungal disease of honey bee brood caused by *Ascosphaera apis.* Supplemental feeding to improve the nutritional and health status of honey bees, keeping hives clean and well ventilated, using clean equipment, and avoiding transfer of combs between colonies are the possible management and sanitation strategies to control the Chalkbrood disease (Aronstein and Murray, 2010).

European foulbrood (EFB) disease is caused by the Gram-positive bacterium *Melissocccus plutonius* (Forsgren, 2009). EFB affects honey bee larvae. Adult

worker bees act as carriers of the bacterium within the colony, between colonies and apiaries (Belloy *et al.*, 2007; Mckee *et al.*, 2003). In many countries, Oxytetracycline hydrochloride (OTC) is used as a bacteriostatic antibiotic to inhibit the multiplication of the causal organism (Thompson and Brown, 2001).

2.5 Apiculture

Apiculture contains the management and scientific background for the management of honey bees. Rearing of bees is done for honey production or wax production or crop pollination (Punchihewa, 1994). According to FAO, (2009), there are the ten excellent reasons for engaging in apiculture such as pollination process, production of bee honey, bee wax like products, required few resources only, no need of land ownership, no competition with other livestock or crops for pollen and nectar, having benefits to different sectors and trades from a strong beekeeping industry, apiculture encourages ecological awareness, everybody can be a beekeeper and apiculture is being environmentally friendly.

According to Chanthayod *et al.*, 2017 have resulted that all beekeepers being male (98%) and beekeeping families had a marginally higher net income from honey production than non-beekeepers. Family size, number of labors, education level, and beekeeping experience affects honey income generation. Beekeepers have more conservation-minded attitudes and they tend to be more environmentally friendly. Lack of technology for apiculture, lack of bee honey market information is the main constraints in apiculture.

Rock bee (*Apis dorsata*), little bee (*Apis florea*), Indian bee (*Apis cerana*), European bee (*Apis mellifera ligutica*), and stingless bee are the honey bee species in India. During the honey flow season, honeybees have to be managed by providing more space for honey storage, dividing strong colonies into two or three new ones, and building a sufficient population prior to honey flow by providing sugar syrup. Management methods such as providing sufficient shade conditions, sprinkling water on gunny bags or rice straw put on the hive to increase RH and reduce the heat, providing sugar syrup, pollen supplements or substitutes, and water should be needed during the severe summer season (Kishan *et al.*, 2017).

2.6 Bee honey value chain

The concept of the value chain was introduced by Porter in 1985 (Zamora, 2016). The value chain represents a series of activities that an organization performs to deliver a valuable product for the market (Simatupang *et al.*,

2017). When a product or a service moves from one actor in the chain to another, it is assumed to gain value (Hellin and Meijer, 2006; Zamora, 2016).

The value chain is defined by Kaplinsky as "the full range of activities which are required to bring a product or service from conception, through the intermediary phases of production, delivery to the final consumer, and final disposal after use" (Kaplinsky and Morris, 2001). In Porter's value chain; there are two categories of business activities, "primary" and "support". Primary activities consist of five components, and all are essential for adding value to the product or service. Inbound logistics, operations, outbound logistics, marketing and sales, and services are the "primary activities". Support activities help to make the primary activities more efficient. Procurement, technological development, human resources management, and infrastructure are the "support activities" in the value chain (Porter, 2001).

In 2011, Shackleton *et al.,* revealed that honey and honey products are sold at different stages of the value chain through both formal and informal channels in Zambia. In isolated, traditional honey production areas, honey is directly sold to buyers. In less isolated areas producers or intermediaries travel to the market. Women actively participate in honey marketing and sales. Formal companies and traders buy honey from individuals or groups.

The value chain actors who manage a particular product through the value chain include, input supplier, producer, processor, wholesaler, retailer and final consumer (Hellin and Meijer, 2006). “The wholesaler is one who buys goods on a large scale with the objective of selling them at a profit in smaller quantities.” (Carrad and Oliphant, 1970). Retailers typically buy goods from a manufacturer, wholesaler, or other distributor and then resell them to the consumer (Hudson, 2020). Retailing consists of all the activities of selling goods or services directly to the final consumer (Kotler and Armstrong, 2012).

3. METHODOLOGY

3.1. Study Area

Anuradhapura district was purposely selected for the study since there is a high demand for bee honey, produced in dry zone areas due to its unique flavour. *Palugaswewa* Agrarian Service Division (ASD) (8°19′0″N, 80°35′0″E) was purposely selected to test the suitability of the proposed model because there are numerous fruit and vegetable growing farmers. *Bandarawela* DS division (6°50′13″N, 80°59′8″E) was purposively selected as the bee honey producing area under Smallholder Agribusiness Partnership Program (SAPP) to study the existing bee honey value chain to identify the

facts related to the successful establishment of a new bee value chain in *Anuradhapura.*

3.2. Sample Size

A total of 130 samples were selected by using a simple random sampling method. 50 beekeepers from the *Banadarawela* DS division and 50 fruit or vegetable growing farmers in the *Palugaswewa* ASD area were selected. 10 respondents from each actor in the value chain were used (i.e. processor, retailers, and consumers).

3.3. Data Collection

Primary data were collected using a pretested structured questionnaire.

3.4. Data Analysis

The binary Logistic Regression model was proposed (Schulz *et al.*, 2014) to identify the factors affecting farmers' willingness on apiculture.

$$\textbf{Log [Y]} = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} X_{10} + \varepsilon$$

Where the dependent variable is the willingness to do apiculture with considering the phobia to bee stings (binary). There are nine independent variables as; age, gender, level of education, awareness about beekeeping and technology, land size, information access on apiculture, credit access for apiculture, starting capital for apiculture and farmers' income (Mujuni *et al.*, 2012; Ahikiriza, 2016).

Almost all the responders in *Palugaswewa* were willing to do apiculture. But people with apiphobia would be unsuccessful in apiculture. A phobia is a "type of anxiety disorder defined by a persistent and excessive fear of an object or situation" (American Psychiatric Association, 2013). Melissophobia or apiphobia is the fear of bees. Thus, apiculture cannot be practiced by people with the phobia for bee stings. Therefore, true willingness is considered as the dependent variable where people who do not have the phobia for bee stings.

A SWOT Analysis was conducted to see the applicability of the suggested model by Premarathne *et al.*, 2018.

The Gross Margin and Market Margin analysis techniques were used to determine the profit gained by different actors in the bee honey value using 10 respondents from each actor in the value chain.

Gross Margin (GM)

Gross margin (GM) is defined as the difference between total revenue and total variable costs (Lazaro, 2008).

$$GM = \sum TR - \sum TVC = \sum PyY - \sum PxX \quad \ldots\ldots\ldots\ldots (1)$$

Where GM = Gross margin per 30ml of bee honey bottle
$\sum TR$ = Total revenue from sales of one 30ml bee honey bottle
$\sum TVC$ = Total variable cost spent on producing / selling of one 30ml bee honey bottle
Py = Price of honey per one 30ml bee honey bottle
Px = Price of input used in producing one 30ml bee honey bottle
Y and X are the quantities of honey produced and inputs used respectively.

Market Margin (MM)

The marketing margin (MM) is the percentage of the final weighted average selling price taken by each stage of the marketing chain (Tomek and Robinson, 1991).

$$MM = WSp - WBp / WSp * 100 \quad \ldots\ldots\ldots\ldots (2)$$

Where MM = Market Margin
WSp = Selling price
WBp = buying price

4. RESULTS AND DISCUSSION

4.1. Socio-economic profiles of beekeepers in *Bandarawela*

The results were based on the responses of 50 beekeepers in *Bandarawela.* The majority of the beekeepers were male (78%) and 60% of the beekeepers were above 50 years of age. Regarding the educational background 66% had attended up to G.C.E. O/L. When considering the monthly income, 38% of the beekeepers received monthly income between 10,000 and 30,000. Beekeepers who received more than LKR 50,000 monthly income were either government employees or private-sector employees. The majority of the beekeepers (73%) cultivated upcountry vegetables other than beekeeping. The average land size owned by a beekeeper was 0.91ac.

Every beekeeper had more than 5 years of experience in beekeeping and 66% had experience of over 10 years. Previous experience was considered as a pre-requisite for joining the project.

More than 90% of the beekeepers mentioned that the environmental conditions such as rainfall and deforestation, current market price, market opportunities, and agro-chemicals were highly affecting for beekeeping.

Beekeeping contributes 22% to the annual income of a beekeeper. The beekeeper can receive an average of Rs. 16,000 annual income by maintaining only 2 bee honey colonies. Engage in beekeeping as a supplementary income ensures a considerable amount of monthly income. Even though bee honey harvesting is not practicing regularly, the beekeeper can store the products until it gets a fair price. Therefore, beekeepers can receive a year-round income by identifying the demand and supply of the product.

4.2. Socio-economic profiles of fruit and vegetable farmers in *Palugaswewa* ASD

The results were based on 50 fruit and vegetable growing farmers in *Palugaswewa* ASD. The majority of the beekeepers were male (70%) and 40% of the beekeepers were with the age range of 40-50. Regarding the educational background 72% had attended up to G.C.E. O/L. When considering the monthly income, 40% had monthly income between 10,000 and 30,000. The average land extent per farmer was 8.88ac.

From the studied sample 27 farmers liked apiculture as a supplementary income source (54%) and 23 farmers did not like it. Difficult in finding inputs like bee boxes, not having sufficient knowledge on hive management, phobia to bee stings, and unable to afford starting capital for beekeeping themselves were the mentioned reasons for not like apiculture as a supplementary income source.

Based on the survey, 43farmers (86%) said that they have information access on apiculture through agricultural instructors. Remaining 7 farmers (14%) said they do not have access to information and their most preferable information source was via organizations. Regarding their knowledge about beekeeping, 30 farmers (60%) said, they have sufficient knowledge about beekeeping. When considering the capital access, 23 farmers (46%) said that they can afford the capital for beekeeping by themselves and 27 (54%) farmers said that they like to apply for a loan to access the credit. Among those 27, 21 farmers preferred to get a loan through government banks and 6 preferred through farmer organizations.

4.3. SWOT Analysis

Premarathne *et al,* (2018) have conducted the SWOT analysis by using the available literature and suggested the BIOFIN model for farmer level. However, a SWOT Analysis was conducted for *Palugaswewa* Agrarian Service Division (ASD) using the data gathered through the structured questionnaire to examine the validity of the previous study. The results revealed that,

Strengths

1. There are enough land resources around the study area (Average land size per person – 8.88ac)
2. There are enough pollen and flower nectar for honey bees – 52%
3. Availability of bee attractive plants – 64%
4. Most farmers have basic knowledge and experience about beekeeping – 60%
5. Easy to find bee colonies – 90%

Weaknesses

1. Lack of specific skills for the establishment and maintenance of honeybee colonies – 40%
2. Lack of technical guidance – 80%
3. Low access to specific equipment such as bee boxes, smoker, honey extractor and Hazmat suit – 84%
4. Low interesting among women – 10%
5. Most farmers unable to afford the capital – 46%

Opportunities

1. Good growing demand for dry zone bee honey in both local and export market
2. Can link beekeeping with the tourism industry (Wos, 2014; Pelaez,2019; Belma, 2020)

Threats

1. Deforestation - 76%
2. Pest and disease incidence – 58%
3. Impact of climate change – 40%
4. Over-application of pesticides – 68%

4.4. Factors affecting farmers' willingness for apiculture in the *Anuradhapura* district

Table 1: Model Estimate

Variables	**Parameter Estimates (β)**	**p> |z|**
Land size	3.085233	**0.015*****
Gender		
0 Female	-2.963439	**0.012*****
1 Male	Reference group	-
Income		
1 (<10,000)	Refence group	-
2 (10,000-30,000)	2.71539	0.130
3 (30,000-50,000)	Omitted	-
4 (>50,000)	No observations	-
Level of education		
1 (No schooling)	Reference group	-
2 (Up to primary education)	No observations	-
3 (Up to GCE O/L)	-1.216946	0.522
4 (Up to GCE A/L)	-6.604474	**0.074****
Age		
1 (<30)	Reference group	-
2 (30-40)	-1.899204	0.458
3 (40-50)	-2.660987	0.418
4 (>50)	-7.091163	**0.089****
Awareness about beekeeping and technology	-1.392328	0.178
Information access on apiculture	2.632179	**0.067****
Starting capital for apiculture	-3.438321	0.159
Credit access for apiculture	2.688263	**0.041*****
Constant	-20.54968	0.017

(***Significant at 5%, ** Significant at 10%)

Source: Feld survey, 2020

According to binary logistic regression analysis, Land size, gender, and credit access for apiculture were statistically significant at 5%. Level of education, age, and information access on apiculture were significant at 10% with the dependent variable. Income, awareness about beekeeping and technology, and starting capital for apiculture were not statistically significant (Table 2). But Ahikiriza, 2016, and Mujuni *et al.*, 2012, revealed that age of the farmer, level of education, level of awareness about beekeeping and technology, information access on apiculture, and starting capital for apiculture were significantly affected for the farmers' willingness on apiculture.

As revealed by the results, gender (p=0.012) has a negative relationship with the willingness for apiculture. Compared to males, females are less likely to engage in apiculture. Being female decreases the willingness for apiculture. One possible reason for that could be the bee sting phobia. Research carried out by Kumwenda, 2016, also got the same results and the mentioned reason for that is female is not able to do apiculture without the help of men. Mburu *et al*., 2015 pointed out that most of the women do not carry out activities like hanging of beehives, beehives construction, and repair and bee honey harvesting. Lack of skills, bee sting phobia, and cultural constraints would be some of the reasons for not being interesting in beekeeping. In most African countries, beekeeping is predominantly a male activity (Shackleton, 2011). But in Pakistan, women are involved in beekeeping by feeding bee's supplements, extracting bee honey from combs, and packaging (Qaiser *et al.*, 2013).

Land size (p=0.015) has a positive relationship with the willingness for apiculture. It implies that, when the farmer has more land, his willingness for doing apiculture is increased. Research carried out by Kumwenda, 2016, also got the same results. When the farmer has more land to cultivate, this attracts more honey bee pollinators to his land. So, farmers can easily find honeybees required for doing apiculture. On the other hand, more honeybees around his cultivation mean his production will be higher. Those are the possible reasons for the increment of farmers' willingness on apiculture when the increase of land size. Credit access for apiculture (p=0.041) has a positive relationship with the willingness for apiculture. It means, when the farmers have access to the credit their willingness to do apiculture will be increased. In 2012, Mujuni *et al.,* got similar results.

The level of education (p=0.074) has a negative relationship with the willingness for apiculture. According to the results, when a person educates more the willingness to do apiculture is getting reduced. A possible reason would be educated people tend more to find non-farm activities rather than engage in agriculture-based activities as their occupation. The age of the farmer (p=0.089) has a negative relationship with the willingness for apiculture. Results imply that older farmers (>50 years of age) are less interested in apiculture. The result is also supported by earlier studies (Adgaba *et al*., 2014: Kalanzi *et al.,* 2015). Information access on apiculture (p=0.067) was found to be positively related to the willingness for apiculture. Mujuni *et al.,* 2012 also had got the same results and they mentioned, good extension services play a major role in the dissemination of information.

According to the results, the likelihood ratio chi-square of 23.06 with a p-value of 0.027 at a 5% significance level revealed that the whole model fits significantly than the empty model. Pseudo R2 values from 0.2-0.4 indicate

excellent model fit (McFadden, 1974). Therefore, the Pseudo R2: 0.3420 indicates the binary logistic model with gender, age, level of education, land size, information access on apiculture, and credit access as the independent variables are a very good model fit.

Table 2: Model Summary

LR chi2 (12)	23.06
Prob > chi2	0.0273
Pseudo R2	0.3420
Log-likelihood	-22.180985

Source: Author Constructed

4.5. Value Existing bee honey chain in *Anuradhapura* district

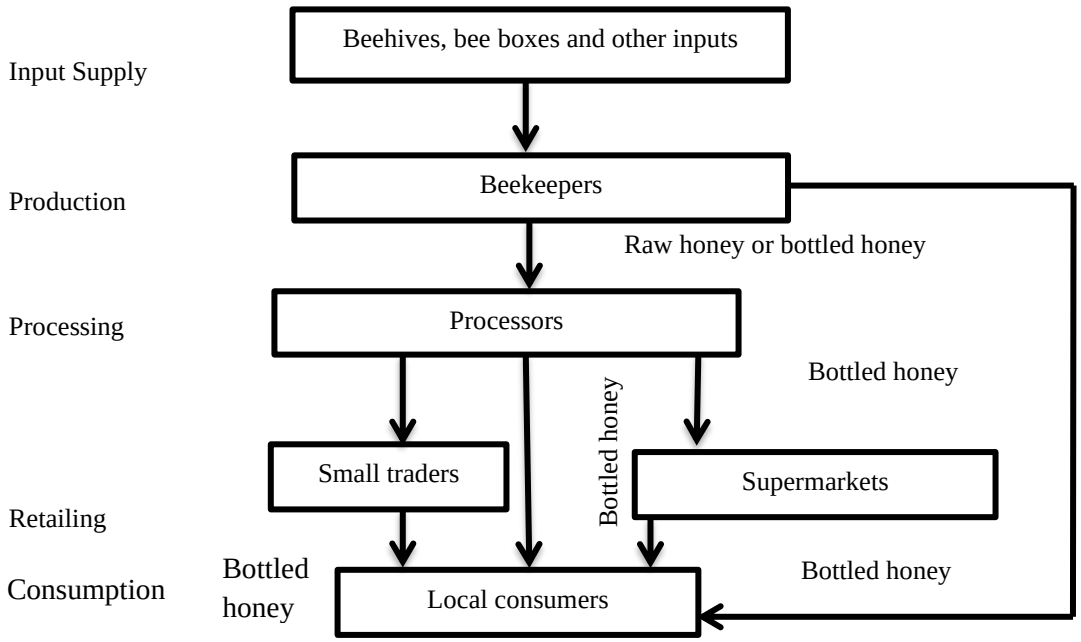

Figure 1: Existing bee honey value chain in *Anuradhapura* district

4.6. Bee honey marketing channels in *Anuradhapura* district

Beekeeper – local consumer
Beekeeper – processor – local consumer
Beekeeper – processor - small trader - local consumer
Beekeeper – processor - supermarket - local consumer

In *Anuradhapura*, the most common bee honey marketing channel is beekeeper – processor – local consumer. Most of the regional processors buy one raw honey bottle (750ml) at Rs.800 to RS.1000 directly from the beekeepers or honey collectors in the *Anuradhapura* district. The price is varying with the time of the year due to supply. Processors buy 500 to 2000kg of raw honey at once per one honey flow season. Quality of the bee honey, fineness of the bee honey, and purchasing price are the most considering factors by the processor. Processors produce 30ml, 180ml, 750ml, and 1000ml bottles and among them, 30ml and 180ml have more demand (86%).

In supermarkets, there was a low demand for bee honey. Processors are the supply side to supermarkets. Only 6 to 8 bottled bee honey is being sold per month in *Anuradhapura* supermarkets. Imported bee honey collection is more common in observed supermarkets. Garlic in honey (immersed) and cinnamon in honey(immersed) like value-added products are found in supermarkets other than raw honey. Consumers buy bee honey in supermarkets by considering its nutritional value and for beauty cultural purposes. Some consumers in urban areas believe that the quality of bee honey in supermarkets is superior to other local small retail shops.

According to the general definition for wholesaler, it was difficult to identify wholesalers in the *Anuradhapura* district. Beekeeper or processor directly sells their product to either consumer or to the retailer. In retail shops (small trades), 30ml, 90ml, and 180ml bottled bee honey can be commonly found. The processor is the supplier of retail shops.

From the interviewed consumers, 60% said that they buy honey from processors and 30% said that they buy honey from supermarkets. Remaining 10% buy honey from retailers (small traders). Consumers who receive more than Rs.100, 000 monthly income usually buy bee honey from supermarkets for health benefits. They buy bottled bee honey for every three months. Consumers who receive Rs. 50,000 – 100,000 monthly income ranges buy honey from processors. Consumers pay more attention to price, quality, taste, and packaging when they buy bee honey. They highly consider the date of manufacture, expiry date, price, and the quantity displayed within the label.

Table 3: Distribution of gross margin and market margin in value chain actors

Actor	Market Margin (MM) % Rs./30ml bottle	Gross Margin (GM) Rs./30ml bottle
Processor	45	45
Retailer	14	15

Source: Field survey, 2020

The findings of the analysis for the gross margins received by actors in the value chain revealed that processors obtained the highest gross margin and market margin. According to the identified value chain channels, there was a strong forward relationship of the beekeeper. Those could be clearly identified. But it was difficult to identify the backward relationship of a beekeeper with the input supplier.

4.7 Bee honey Production in *Bandarawela*

According to the studied sample in *Bandarawela*, beekeeping was directly linked to a private organization. The linkage ensured a fixed price to the beekeeper and a market to the product. Beekeepers sold a greater portion of their raw honey to the bee honey collection centers. Some amount of raw honey is sold directly to the consumers. In the studied sample 64% of beekeepers have used glass bottles as their packaging type. They did not use any kind of labeling method for their product. They did not practice storing of the bee honey. They did not have stocks of honey at the time of the interview. Due to the heavy rain in 2019, the colony number had reduced significantly. Heavy rains slow honey bees' flying ability and lead breakages in bees' wings (Urquhart, 2018). According to the beekeepers, black mustard tree (*Brassica juncea*), Kudu-Dawula *(Neolitsea fuscata*), and avocado tree (*Persea Americana)* can attract honey bees. Therefore, they think, those types of trees should be protected to protect honey bees.

5. CONCLUSIONS AND RECOMMENDATIONS

5.1. Conclusion

From the study, it can be concluded that gender, age, level of education, land size, information access on apiculture, and credit access for apiculture have a significant influence on the farmers' willingness for apiculture in *Palugaswewa* ASD. According to the results, 54% of the total sample were said they were willing to do apiculture as a supplementary income source. Being women decreases the willingness in apiculture as a supplementary income source mainly due to bee sting phobia and lack of skills. Credit access, land size, and information access on apiculture are positively affected

for the willingness of beekeeping. Of the sample, 46% did not like to apiculture as a supplementary income source. Lack of knowledge in hive management, poor access to inputs, lack of knowledge in market opportunities are the major reasons for not like in apiculture as a supplementary income source. But according to the SWOT analysis conducted, there is a potential and more opportunity in the *Anuradhapura* district for the commercialization of apiculture. The study revealed that there is no commercialized bee honey production in the *Anuradhapura* district. Identified marketing channels revealed that there is a weak backward relationship of a beekeeper with the input supplier. The most common value chain channel for bee honey is beekeeper – processor – local consumer. Processors obtain the highest gross margin along the value chain. According to the conducted SWOT analysis and consumer interviews, it can be identified that there is a growing demand for good quality bee honey for consumption by considering the health and nutritional benefits of bee honey and for beauty cultural uses. Based on the results, apiculture could be introduced as a BIOFIN livelihood option to the fruit and vegetable growing farmers in the *Anuradhapura* district.

5.2. Recommendations

Based on the findings of the study, the following recommendations were made.

1. The extension services are needed to be strengthened for better dissemination of knowledge regarding hive management, harvesting techniques, and value addition. Providing sufficient knowledge about the importance of honeybees and beekeeping in crop production via extension service can help to move chemical-free agriculture.
2. Providing sufficient knowledge and training can improve women participation in beekeeping. Women with bee sting phobia can engage in bee honey harvesting, processing, and selling like activities. Apiculture can be used as a solution for rural women empowerment.
3. The study found that inadequate knowledge in hive management, lack of input supply, and poor harvesting techniques are constraints facing beekeepers. Therefore, there is a need for training beekeepers on appropriate beekeeping and honey harvesting technologies.
4. Providing financial support for the beekeepers. For that mini-bank loans through government state banks would be more supportive for the farmer who is willing to do apiculture in commercialization level.
5. Improvement of market opportunities such as, linking to the export market, value addition, proper packaging, link with the tourism industry to expand the production.
6. Beekeeping should be up scaling up to the commercialization level to improve the living standards of rural people. For that, there should be a proper linkage between beekeepers and input suppliers.

Development of an efficient input supply system improves production and value addition and introducing marketing linkages are important.

7. The study pointed out that there is no proper channel to reach beekeepers. The government should be involved in promoting bee honey-based entrepreneurs. Therefore, beekeepers in *Anuradhapura* can be linked with any private organization by introducing a P4 partnership to protect the beekeeper by ensuring a fixed price and market opportunity. Because in *Bandarawela* there is one of the biggest honey production development projects.
8. The government should assist to improve the quality of bee honey. A certification system can be introduced to maintain the quality of bee honey.

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IMPACT OF DIVIDEND POLICY ON RETURN ON ASSETS: EVIDENCE FROM LISTED NON-FINANCIAL FIRMS IN SRI LANKA.

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ABSTRACT

The dividend policy of a firm is considered as a crucial decision among the management of the organizations. Therefore, the study developed to find out the impact of dividend policy on return on assets of the non-financial firms listed in Sri Lanka, using a randomly selected sample of 100 firms listed in the Colombo Stock Exchange for the period from 2013 to 2017. To test the hypothesis, the study incorporated dividend pay-out ratio, dividend per share as independent variables, sales growth, leverage as a control variable, and return on assets as a dependent variable. Initially the unit root test is carried out to test the stationary of the data set. Descriptive statistics, correlation analysis, and pooled OLS were carried out as research techniques and found that dividend per share significantly impacts on return on assets, and the other hand dividend pay-out ratio does not significantly impact on return on assets of the non – financial firms listed in Sri Lanka. The results suggest that the dividend decisions significantly contribute towards the profitability and therefore, considerable attention is required over the dividend decisions of the organizations and this should be revaluated to serve the investor's potential expectations.

Key words: dividend pay-out, dividend per share, return on assets

1. INTRODUCTION

Dividend decisions are the crucial corporate policy decisions that companies make to ensure their satisfaction with shareholders. On the other hand, it should be balanced with the firm profitability since this influences the retained ratio of the firm. Problems related to dividend policy can be viewed in two different aspects. One aspect of the dividend policy is internal growth and development in capital structure. On the other hand, it is a basic obligation for companies to provide greater prosperity to the shareholders which is bound by the dividend payments. Therefore, the controversy in the dividend decision of an organization is classified as one of the ten unsolved problems in finance (Brealey et al., 2014). The dividend policy of an organization also can be explained as a good marketing tool for a firm since this is one of the key components the investors look into before they make any investment decisions. Ashamu et al., (2012).

Further, the developed dividend policy of an organization is displayed through the pay-out ratio of such an organization. The dividend pay-out ratio explains the proportion of net profit between dividend payments and the amount retained. Therefore, the management should be keen on the factors that determine profitability. In the Sri Lankan context, corporate governance, earnings, investor preference free cash flow, net working capital, investment opportunities, concentrated ownership structure, and firm size, industry impact, past dividends, profitability are identified as the important determinants of the dividend policy (Baker et al. 2019).

The arguments about the dividend payment and related influence on firm values come across an evolution. According to Modigliani and Miller (1953), assuming a perfect market with no taxes and bankruptcy cost, proposed that the dividend policy of a company does not affect the share price of a company itself or the company's capital structure. Later in 1963, including the tax effect on the companies, Modigliani and Miller revised the theory that the increasing level of debt in the capital structure would positively impact on the value of the firm. Therefore, the derived conclusions of the theories regarding dividend policy finally provide an insight into the importance of the dividend payments to the organizations.

A vast number of authors analyzed the impact of dividend policy on firm value and profitability (Sattar et al. 2017; Kawshala and Panditharathna, 2017; Fitri et al., 2016; Khan et al. 2015; Hasan et al. 2015; Gunathilaka, 2014; Thafani and Abdullah, 2014). Even though most of the researches highlighted the problem of dividend policy, the findings of the test results are varying and observed that there is a contradiction in the findings. The following authors, Thafani and Abdullah (2014), Ajanthan, (2013), Kawshala and Panditharathna

(2017), Hasan et al., (2015) found in their research study that there was a positive significant impact observed in dividend pay-out ratio and firm profitability of preceding year. However, on the other hand, researchers found that a negative dividend policy impact on firm profitability (Sattar et al., 2017; Fitri et al., 2016; Hasan et al., 2015; Gunathilaka, 2014). Based on their argument, expressing the earnings volatility of the firm does not depend on the dividend distribution of the firm. Also, dividend payments are viewed as the signalling tool and mollify the market.

Therefore, the researcher identified the varying arguments on the impact of dividend policy on profitability as gab and intended to fill the gap by developing this study.

Further, in the recent past due to the COVID 19 outbreak, the performance of financial firms is getting worse than before. An article published by Fitch Ratings evidenced that the Sri Lankan finance and leasing sector is struggling due to an increase in non-performing loan levels and with the weakening level of profitability because of the credit cost increase and badly affected loan growth. Since there was a negative impact on the profitability of financial firms, the firms would face a serious problem of distributing their profit in-between dividend distribution as well as retention. Therefore, the study developed by excluding the financial firms since there can be abnormal effects on profitability, stated the research problem as follows. 'To what extent the dividend policy has an impact on return on assets of non-financial firms listed in Sri Lanka'. Also, the study mainly focused on the impact of dividend policy on return on assets, since it helps investors to measure the way management follows to generate more income using its available resources or assets. Further, in the perspective of the organization, it is important to understand the potential profitability due to the dividend policy imposed by them rather than the impact on share price, since it is difficult to predict. Therefore, the study developed to find out the impact of dividend policy on return on assets of non-financial firms listed in Sri Lanka.

This paper is organized as follows: Section 2 explains a review of the empirical studies that investigate the dividend policy impact on the profitability of the firms; Section 3 addresses research methods; Section 4 reports the results and discussion, and Section 5 summarises the conclusion.

2. LITERATURE REVIEW

There are developed theories concerning the dividend policy of the firm. Following that the dividend irrelevance theory proposed by Modigliani – Miller (1958) concludes that there is no impact of dividend pattern on share values of the firm. Also, explains that the current savings of the dividend

payment would enhance further on retained earnings and which can be reinvested and future earnings will allow future dividends to grow. Also, the residual approach of dividend policy indicates the earnings available may be retained in the business or it can be reinvested. However, if the funds are not necessary for the business, they can be distributed as dividends. Therefore, the theory assumes that the investors do not differentiate between dividends and retention of the firm. On the other hand, Walter's model, considering the internal rate of return and cost of capital, states that the dividend policy and the value of the firm are significantly related. Accompanied by the argument of Gordon's model, it is clear that a firm share price is dependent on the dividend pay-out ratio. Continuously, the previous authors analysed this area proposed different arguments about the significant relationship and this has been extracted below.

Following authors mentioned a significant relationship exists in between dividend pay-out ratio and firm's profitability.

Thafani and Abdullah (2014), investigated the impact of dividend pay-out on corporate profitability in manufacturing companies listed on the Colombo stock exchange. Using the data from 2007 to 2011, the independent variables of dividend pay-out ratio, firm size, sales growth, and leverage; dependent variables of return on asset and return on equity are calculated. Based on the analysis results, found that there was a positive significant relationship found in-between dividend pay-out ratio and return on assets, return on equity. The study concluded that the dividend pay-out ratio of the firm conveys a certain signal about the profitability.

A study analyzed the relationship between dividend pay-out and firm profitability in listed hotels and restaurant companies in Sri Lanka. To carry out the analysis, dividend pay-out ratio, revenue, and total assets were considered as independent variables, and net profit was used as a dependent variable. The regression analysis results revealed that there was a strong positive relationship between dividend pay-out ratio and firm profitability. Also derived to the conclusion that the dividend policy of the firm was a crucial factor which affects the profitability (Ajanthan, 2013).

Also, a study developed by Kawshala and Panditharathna (2017) examined the effect of dividend policy on corporate profitability in the beverage, food and tobacco industry in Sri Lanka. The study considered the dividend pay-out ratio as the independent variable and return on equity as the dependent variable. Using the collected data from 2012 to 2015, the analysis was carried out using regression analysis and found that there was a positive significant relationship between dividend pay-out ratio and profitability of the firm.

Hafeez et al., (2018) examined the impact of dividend policy on firm performance in listed companies on the Colombo stock exchange from the period 2013 to 2017. Dividend pay-out ratio, earnings per share were considered independent variable and return on assets, return on equity was considered as a dependent variable in this study. The panel data regression analysis was carried out to test the hypothesis of the study and concluded that dividend policy variables show enough evidence for the impact on firm profitability. Further, the study suggested that the current earnings of the firm would provide signals to the future and potential investors and the positive earnings of the firm will enhance the positive dividend policy of the firm in the future.

Farrukh et al., (2017) analyzed the impact of dividend policy on shareholder's wealth and firm performance in Pakistan. The study incorporated 51 firms listed in the Pakistan stock exchange from the period 2006 to 2015. Independent variables considered in the study are dividend per share, dividend yield and earnings per share, share price, return on equity are considered as dependent variables in the study. Based on the regression analysis, the results found that there is a significant positive impact of dividend per share and return on equity.

Additionally, the positive significant impact is supported by Khan et al., (2015). The study investigated the effect of dividend pay-out ratio on firm profitability using the non-financial firms listed in Karachi Stock Exchange 100 index. The data collected for the year from 2008 to 2012 by comprising the independent variables of dividend pay-out ratio, leverage, firm size and the dependent variable of return on assets. By testing the hypothesis, regression results revealed that the dividend pay-out ratio has a significant impact on profitability.

In contradiction to above findings, some researchers found insignificant and negative impact in between dividend pay-out ratio and profitability. In line with that, an author, Rahman (2018) investigated the effect of dividend policy on the firm's performance using 19 cement companies listed in the Pakistan stock exchange from the period 2012 to 2016. Dividend per share, earnings per share, firm size and leverage were considered as the independent variable and firm performance was considered as a dependent variable to test the hypothesis of the study. However, the test results were found as an insignificant impact of dividend per share on firm performance.

Another study investigated the factors that drive the pay-out policy in the bank, finance, insurance and construction sectors. Using annual dividends as the dependent variable, net earnings, financial leverage, institutional investors' shareholding and managerial shareholding as the independent

variable the analysis was carried out and revealed that dividend payments and level of earnings of the firms are negatively related. And concluded that dividend distributions do not reflect the earnings volatility (Gunathilaka, 2014).

Hasan et al., (2015) found the effect of pay-out ratio on firm profitability in the energy and textiles sector listed in Pakistan. The study comprising the data from 1996 to 2008, calculated the dividend pay-out ratio considered as an independent variable and return on assets and return on equity considered as dependent variable. Based on the logarithmic results of the analysis concluded that regardless of the industry, there was a negative impact of dividend pay-out ratio on the earnings of the preceding year.

Fitri et al., (2016) analyzed the factors that impact the dividend pay-out ratio in the listed companies at Jakarta Islamic Index considering the period from 2009 to 2014. Return on assets, debt to equity ratio, asset growth, dividend pay-out ratio of the previous year is considered as the factors that could affect the firm's dividend pay-out ratio. By testing the hypothesis of the study, it was found a negative significant effect of return on assets and dividend pay-out ratio in a year before the dividend pay-out ratio.

Following the above, a research study carried out by Uwuigbe et al., (2012) examined the relationship between financial performance and dividend pay-out ratio based on the listed companies on the national stock exchange. Using the data collected from 2012 to 2017, the independent variables; price to earnings ratio, dividend pay-out ratio and dependent variables; return on assets and return on equity were calculated. According to the regression analysis carried out, the results were found that the dividend policy measures; price to earnings ratio and dividend pay-out ratio do not show any significant impact on firm performance proxies by return on assets and return on equity.

The review of the literature raises a contradiction between the findings among the authors. As explained, the positive and significant impact was posited by Hafeez et al., (2018); Kawshala and Panditharathna, (2017), Farrukh et al., (2017), Khan et al., (2015), Thafani and Abdullah, (2014) Ajanthan (2013). However, the insignificant and negative impact also found by Rahman (2018), Gunathilaka (2014), Hasan et al., (2015), Uwuigbe et al., (2012). Therefore, the present study was initiated to identify the accuracy of the impact of dividend policy on return on assets.

2.1. Conceptualization

Based on the review of literature, the following conceptual model is developed by the researcher.

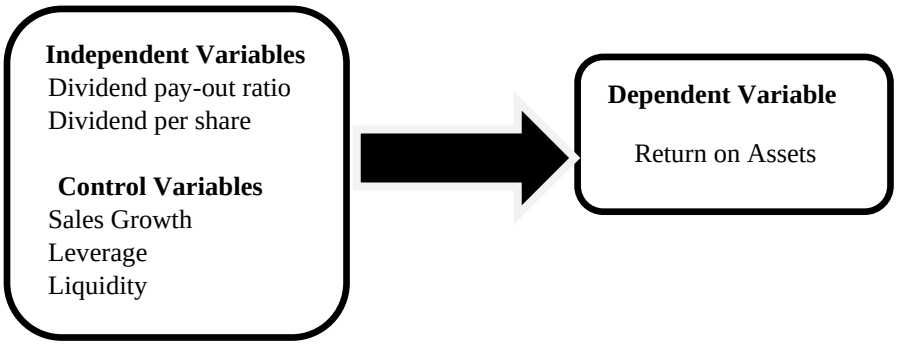

Figure 01: Conceptual Framework

2.2. Operationalization

Table 01: Measurement of variables

Variables	Acronyms	Measures	Authors
Dependent Variables			
Return on Assets	ROA	$\frac{\text{Net Profit before interest and tax}}{\text{Total assets in year t}} * 100$	Adimasu (2019)
Independent Variables			
Dividend Payout Ratio	DPR	$\frac{\text{Dividend per Share}}{\text{Earnings per Share in year t}}$	Adimasu(2019); Sondakh (2019)
Dividend per Share	DPS	$\frac{\text{Dividend Distributed}}{\text{Number of Shares}}$	Farrukh et.al., (2017)
Sales Growth	SGRW	$\frac{\text{Current year Sales} - \text{Previous year Sales}}{\text{Previous years Sales in year t}}$	Ajanthan(2013)
Leverage	LEV	$\frac{\text{Long term debt}}{\text{Total Assets}}$	Adimasu (2019)
Liquidity	LIQ	$\frac{\text{Current Assets}}{\text{Current Liability}}$	Sondakh (2019)

Source: Author Constructed

2.3. Hypothesis of the Study

The researcher developed the hypothesis as follows to test the impact of dividend policy on return on assets.

H_0: There is no significant impact of dividend policy on the return on assets of listed non-financial firms in Sri Lanka.

H_1: There is a significant impact of dividend policy on the return on assets of listed non-financial firms in Sri Lanka.

3. METHODOLOGY

The study intended to incorporate the population of 290 listed firms on the CSE, as of July 2019. The present study excludes Banking, Finance and Insurance companies as they have identical financial characteristics such as; the strength of directives, laws, regulations and formulation of capital structure from non - financial firms. Further, newly listed non-financial and non-dividend paying companies are eliminated in the process of sampling.

Based on the derived samples, 82-firms could be able to consider developing the strong panel data for the five years from 2013- 2017. The data collected from the audited financial reports for the selected companies which are published on the CSE's website.

3.1. Models Specifications

The current study is developed panel data analysis with the 410 observations. 82 non - financial firms are considered in this study considering the panel data collected from 2013 to 2017 to find out the impact of dividend policy on return on assets of Sri Lankan listed non - financial firms.

Initially the unit root test is carried out to test the stationary of the data set. Continuously, pooled OLS is performed to address the impact of dividend policy on return on assets of Sri Lankan non - financial firms. Proposed models are given below:

i) **Pooled OLS Models**

$$ROA_{it} = \alpha_0 + \alpha_1 DPR_{it} + \alpha_2 SGRW_{it} + \alpha_3 LEV_{it} + \alpha_4 LIQ_{it} + \varepsilon_{it} \text{.....(1)}$$

$$ROA_{it} = \alpha_0 + \alpha_1 DPS_{it} + \alpha_2 SGRW_{it} + \alpha_3 LEV_{it} + \alpha_4 LIQ_{it} + \varepsilon_{it} \text{.....(2)}$$

Where,

DPR_{it} - Dividend Payout ratio of firm i at time t.

DPS_{it} - Dividend per Share of firm i at time t.

$SGRW_{it}$ - Sales Growth of firm i at time t.

LEV_{it} - Leverage of firm i at time t.

LIQ_{it} - Liquidity of firm i at time t.

α_0 – intercept coefficient of firm i;

α_1, α_2, α_3, α_4, α_5, α_6 & α_7 – row vectors of slope coefficient of regressors

ε_{it}: Stochastic error term of firm i at time t

u_{it}: error term of firm i at time t

4. RESULTS

4.1. Descriptive statistics

Following table 2 shows the summary details of the data used for the study.

Table 02: Summary Statistics of the variables

Variables	Obs	Mean	Median	Min	Max	SD
DPR	410	0.5387	0.5387	-7.6273	12.9908	1.2077
DPS	410	6.3203	6.3203	0.0000	0.0000	13.3182
SGRW	410	7.2427	6.4593	-99.456	83.1315	18.5136
LEV	410	0.3651	0.3626	0.0010	0.9703	0.21884
LIQ	410	3.4791	1.6064	0.0679	55.5993	6.6949
ROA	410	12.7353	10.1639	-7.5405	100.5177	100.5177

Source: Author Constructed

The mean (median) value of the dividend pay-out ratio is 0.5387 and dividend per share is 6.3203, which implies out of the earnings of the selected non-financial firms approximately half (53.87%) of the earnings are distributed as dividend to their shareholders with a minimum of -7.6273 and a maximum of 12.9908. The dividend per share has no minimum value and a maximum value. The average (median) sales growth of the companies is 7.2427 (6.4593) with a minimum of -99.456 and a maximum of 83.1315. Leverage has an average (median) of 0.3651 (0.3626) with a minimum of 0.001 and a maximum of 0.9703. Also, the mean (median) value of liquidity is

3.4791(1.6064) with a minimum of 0.0679 and a maximum of 55.5993. The dependent variable, return on assets shows an average (median) of 12.7353 (10.16391) with a minimum of -7.5405 and a maximum of 100.5177.

4.2. Unit Root Test

Table 03: Panel unit root test: Summary – Dividend per share

Method	Statistic	Prob.**	Cross sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-8.07718	0.0000	81	324
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-1.85785	0.0316	81	324
ADF - Fisher Chi-square	169.004	0.3370	81	324
PP - Fisher Chi-square	216.231	0.0028	81	324

Sample: 2013 2017

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Source: Author Constructed

The study carried out a unit root test to find out the stationary of the data. The Levin, Lin and Chu t-test shows a p-value of 0.0000, which indicates that there is no unit root in the data set and implies that the considered dividend per share data for the analysis is stationary.

Table 04: Panel unit root test: Summary – Dividend pay-out ratio

Method	Statistic	Prob.**	Cross sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-55.4614	0.0000	82	328
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-10.2574	0.0000	82	328
ADF - Fisher Chi-square	278.243	0.0000	82	328
PP - Fisher Chi-square	320.083	0.0000	82	328

Source: Author Constructed

The Levin, Lin and Chu t-test shows a p-value of 0.0000, which indicates that there is no unit root in the data set and implies that the incorporated dividend pay-out ratio data for the analysis is stationary. Also, the other tests carried out resulted in a p-value of 0.0000. Therefore, the results evidence the stationary of the data set.

Table 05: Panel unit root test: Summary – Sales Growth

Method	Statistic	Prob.**	Cross sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-22.0713	0.0000	82	328
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-5.56977	0.0000	82	328
ADF - Fisher Chi-square	230.890	0.0004	82	328
PP - Fisher Chi-square	259.417	0.0000	82	328

Source: Author Constructed

The Levin, Lin and Chu t-test shows a p-value of 0.0000, which indicates that there is no unit root in the sales growth data set. The data is therefore stationary. Also, the other tests carried out resulted in a p-value of 0.0000. Therefore, the results evidence the stationary of the data set.

Table 06: Panel unit root test: Summary – Leverage

Method	Statistic	Prob.**	Cross sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-5.53157	0.0000	82	328
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-1.48320	0.0690	82	328
ADF - Fisher Chi-square	172.618	0.3070	82	328
PP - Fisher Chi-square	204.715	0.0170	82	328

Source: Author Constructed

The Levin, Lin and Chu t test shows a p value of 0.0000, which indicates that there is no unit root in the data set and implies that the used leverage data for the analysis is stationary.

Table 07: Panel unit root test: Summary – Liquidity

Method	Statistic	Prob.**	Cross sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-28.7951	0.0000	82	328
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-5.50610	0.0000	82	328
ADF - Fisher Chi-square	219.542	0.0025	82	328
PP - Fisher Chi-square	264.616	0.0000	82	328

Source: Author Constructed

The Levin, Lin and Chu t test shows a p value of 0.0000, which indicates that there is no unit root in the liquidity data set. The data is therefore stationary. Also, the other tests carried out resulted in a p value of 0.0000. Therefore, the results evidence the stationary of the data set.

Table 08: Panel unit root test: Summary – Return on Assets

Method	Statistic	Prob.**	Cross sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-14.3375	0.0000	82	328
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-3.46478	0.0003	82	328
ADF - Fisher Chi-square	201.406	0.0248	82	328
PP - Fisher Chi-square	249.249	0.0000	82	328

Source: Author Constructed

The Levin, Lin and Chu t test shows a p value of 0.0000, which indicates that there is no unit root in the return on assets data set. The data is therefore stationary. Also, the other tests carried out resulted in a p- value which is less than 0.05. Therefore, the results evidence the stationary of the data set.

4.3. Correlation Analysis

Table 09, reports the Pearson correlation coefficients between the variables selected for the study. The relationship between the variables can be observed by carrying out the correlation analysis. It can be observed that there is a positive relationship shown in-between the selected independent variables; dividend pay-out ratio and dividend per share and the dependent variable; return on assets (Kawshala and Panditharathna, 2017, Thafani and Abdullah, 2014; Ajanthan, 2013). However, based on the probability value, only dividend per share shows a significant relationship on return on assets (Farrukh et al., 2017). On the other hand, the dividend payout ratio does not show a significant impact on return on assets (Gunathilaka, 2014; Uwuigbe et. al., 2012). Further, other explanatory variables; sales growth and leverage show a positive relationship and leverage shows a negative relationship on return on assets.

Observing the insignificant probability values among the explanatory variables explains that there is no serious interrelationship between the independent variables. Therefore, it also can be concluded that multicollinearity is not a serious problem in this study.

Table 09: Correlation Matrix

Correlation Probability	DPR	DPS	SGRW	LEV	LIQ	ROA
DPR	1.0000					

DPS	0.0468	1.0000				
	0.0468	------				
SGRW	-0.0224	-0.0216				
	0.6509	0.6624				
LEV	-0.0364	0.0957	0.1464	1.0000		
	0.4628	0.0529	0.0030	------		
LIQ	-0.0237	-0.0290	-0.0329	-0.4336	1.0000	
	0.6324	0.5583	0.5068	0.0000	-----	
ROA	0.0574	0.4125	0.0701	0.1249	-0.0084	1.0000
	0.2465	0.0000	0.1563	0.0113	0.8649	-----

Source: Author Constructed

4.5. Regression Analysis

Model (1)
Dependent Variable: ROA
Method: Panel Least Squares
Sample: 2013 - 2017
Periods included: 5
Cross-sections included: 82
Total panel (balanced) observations: 410

Table 10: Impact of dividend per share on ROA

Variable	**Coefficient**	**Std error**	**t-statistic**	**prob**
C	7.1211	1.4959	4.7605	0.0000
DPS	0.4224	0.0470	8.9963	0.0000
SGRW	0.0496	0.0340	1.4587	0.1454
LEV	6.1433	3.2035	1.9177	0.0559
LIQ	0.0985	0.1032	0.9547	0.3403
R-squared	0.1839		Mean dependent var	12.7353
Adjusted R-squared	0.1758		S.D. dependent var	13.8545
S.E. of regression	12.577		Akaike info criterion	7.9139
Sum squared resid	64073.06		Schwarz criterion	7.9629
Log likelihood	-1617.347		Hannan-Quinn criter	7.9333
F-statistic	22.8085		Durbin-Watson stat	0.7774
Prob(F-statistic)	0.000000			

Source: Author Constructed

Based on the findings of regression analysis, it shows that there is a significant positive impact of dividend per share on return on assets since the p-value is being 0.0000 with the t statistic of 8.9963. The finding of the study is in line with the findings of Farrukh, et al., (2017). Therefore, the results supported the developed hypothesis H_1 in this study. The results of the study imply that the increasing level of dividends distributed by the firms would increase the profitability of the next period since the attractive nature of firms would positively impact the stock market to effectively carry out the operations.

The other independent variables considered in this study do not show any significant impact on return on assets in this study. Also, R squared value is derived by the study is 18.39%, which explains that the dependent variable; return on assets is explained as a result of dividend per share only by 18.39%. Also, the F-statistics of the test results shows a value of 0.0000, which indicates the model selected in this study is perfectly fitted.

Model (2)
Dependent Variable: ROA
Method: Panel Least Squares
Sample: 2013 2017
Periods included: 5
Cross-sections included: 82
Total panel (balanced) observations: 410

Table 11: Impact of dividend pay-out ratio on ROA

Variable	Coefficient	Std. error	t-statistic	Prob.
C	8.2928	1.6677	4.9726	0.0000
DPR	0.7474	0.5639	1.3255	0.1858
SGRW	0.0392	0.0371	1.0542	0.2924
LEV	9.1542	3.4892	2.6236	0.0090
LIQ	0.1191	0.1129	1.0550	0.2921
R-squared	0.0249	Mean dependent var.	12.7353	
Adjusted R-squared	0.0154	S.D. dependent var.	13.8545	
S.E. of regression	13.7477	Akaike info criterion	8.0917	
Sum squared resid.	76545.16	Schwarz criterion	8.1407	
Log likelihood	-1653.808	Hannan-Quinn criter.	8.1111	
F-statistic	2.5947	Durbin-Watson stat	0.6818	
Prob.(F-statistic)	0.03607			

Source: Author Constructed

The test results of model 2 indicate that the dividend pay-out ratio does not have a significant impact on return on assets. The finding insists that the distribution of the dividend out of the earnings would reduce the retained amount which can be invested for the firm's future development or expansion. Therefore, increasing the level of dividend pay-out ratio is identified as a factor that doesn't affect the firm profitability proxied by return on assets. The results show a p-value of 0.1858 which is more than the 5% significance level, therefore it can be concluded that the dividend pay-out ratio does not impact on return on assets on non-finance institutions listed on Sri Lanka. The derived result is consistent with the findings of Gunathilaka (2014); Uwuigbe, et al., (2012). However, the finding is contradicted with the findings of Kawshala and Panditharathna (2017).

Among the independent variables, firm leverage shows a significant impact on return on assets. The p-value of leverage shows 0.009 and which is significant at 95% confidence level. The other independent variables do not show any significant impact on the return on asset in model 02. The R squared value shows that only a 2.5% impact on the dependent variable is existed by the independent variables of the study. Also, F statistics value is 0.036, which is less than 0.05 means the model 2 selected in this study is appropriate.

5. CONCLUSION

The study aims at finding the impact of dividend policy on return on assets in listed non-financial firms in Sri Lanka. The data collected from the period of 2013 – 2017, for 82 non-financial firms listed on the Colombo Stock Exchange. The research study utilized regression analysis to test the hypothesis. Based on the regression results, revealed that there is a positive significant impact in-between the variable dividend per share and return on assets on the preceding year (Hafeez, et. al 2018; Farrukh 2017; Kawshala and Panditharathna, 2017; Khan, et al., 2015; Thafani and Abdullah, 2014; Ajanthan, 2013). The results imply a salient importance to the dividend policy of the firm. The increasing level of dividend for the existing shares in a firm would be able to attract more equity towards the firms since the attraction for the shares in the market would rise and gradually in the share price. The scenario would allow the firms to carry out the operations effectively, which enhance the profitability.

However, the other variable; the dividend pay-out ratio measured the dividend policy showed an insignificant impact on return on assets. It suggests that the firms should maintain their image through the signalling effect by paying higher dividends to their shareholders. It manages' responsibility to make decisions over the dividend policy of the firm by incorporating prospects of the firm. The research therefore contributes to the decision makers that the

dividend policy is a crucial factor to be considered to enhance the profitability of the firms.

On the other hand, paying more dividends out of the earned profit would reduce the retained money for the organization growth or development in the future. As well as the lack of money retained within the organization would become a risk in unexpected situations to handle them effectively. Therefore, the dividend distribution and retaining portion out of the earnings to be balanced in-between both optimally according to the firm's special nature.

6. LIMITATIONS AND SCOPE FOR FURTHER RESEARCH

The limitation of the study is pointed out below:

1. The data tested for this study is based on secondary sources published by the companies.

2. Further, to test the results data set collected for 5 years only.

In the future, the studies can develop by increasing the period of data collection. Mainly, future researches can incorporate the determinants of dividend policy such as leverage, capital structure, ownership structure, shareholder's expectations, and the ability to pay tax of the shareholders to enhance the findings in the area of dividend policy.

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DETERMINANTS OF WOMEN'S ECONOMIC EMPOWERMENT: AN EMPIRICAL STUDY AMONG RURAL POOR WOMEN IN SRI LANKA

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ABSTRACT

Women empowerment can be simply defined as giving opportunities to women to enable them to be financially and economically stable. Economic empowerment means the ability to implement decisions that involve the control over allocation of financial resources. Empowerment of women through correct financial decisions in their social and financial activities has a positive effect on their economic empowerment and will ultimately enhance the economic growth. Almost eighty percent of the Sri Lankan population live in rural areas of the country. Out of those, the majority is under the poverty line and is considered as poor. Therefore, the purpose of the research is to identify the determinants of women's economic empowerment and to analyse the most significant determinant of women's economic empowerment in rural poor women in Sri Lanka. Ergo, rural poor women lining under the poverty line in Sri Lanka was taken as the target population. The sample size was 426 women covering all the districts in the country. As per the nature of the primary data, the survey method was used to collect data, the researcher administrated questionnaire was employed as the research instrument. The multilevel mixed sampling method was adopted as a sampling technique. The researchers employed the structural equation model and Smart-PLS 3 as the main analytical software. With the meta-analysis, the researcher

identified five main determinants of women's economic empowerment as: Economic decision-making power, Control over the use of income and expenditures, Control over the time allocation, Leadership in community and financial wellbeing. The Research findings revealed that both economic decision-making power and control over the use of income and expenditures made a significant impact to the women's economic empowerment and the economic decision-making power is investigated as the most significant determinant among the five determinants. The financial wellbeing was revealed as the least significant determinant for determining the women's economic empowerment among the rural poor women in Sri Lanka.

Key words: Women's economic empowerment, Economic decision-making power, Control over the use of income and expenditures, Control over the time allocation, Leadership in the community.

1. INTRODUCTION

Women's economic empowerment (WEE) is the process of achieving women's equal access to and control over economic resources, and ensuring they can use them to exert increased control over other areas of their lives (Haque, & Zulfiqar ,2016). Women's economic empowerment is a top priority in the work to reduce poverty. Women must be viewed, just as men are, as economic actors as well as obvious and necessary agents of change. Sri Lankan as a developing country, women in rural areas have to confront many challenges so as to obtain economic empowerment. A 52% of the entire Sri Lankan population is composed of women, and when it comes to the life expectancy rate, women (79%) and they are 7 years ahead of men (72%) (Global financial development report, 2018). Thus, their expenses spread over a longer period of time. Fortunately, in a general sense only 8% of women among them are illiterate. These women are poor in financial knowledge and particularly, lack of financial skills and proper financial attitudes and therefore, poor in financial decision making. Consequently, if as a nation, Sri Lanka is able to obtain a higher involvement of women into the income generation process, it will not only be a decisive point for a country like Sri Lanka, but also will fulfil the crucial criteria of the millennium development goals (MDGs).

According to the International Monetary Fund (IMF), the participation of women in the workforce is rapidly increasing when compared to men and a 40% of the current global workforce is composed of women (IMF, 2017). In the local context, the labour force partaking based on gender is 78.9% male in contrast to 38.5% female (Global Gender Gap Report, 2018). Sri Lankan women are mostly employed in health and education sectors, hospitality and

textile industries and overseas as domestic assistants. In addition to working at the workplace, women also engage in unpaid household work, thus playing a critical role in providing economic growth. Hence, in the near future, the role played by women in route for their economic empowerment and world prosperity will be of higher importance. In accordance with the above discussion, the researchers noted that women's economic empowerment as a crucial area which needs to be further investigated with relation to enhance the rural development. More specifically, to identify the most significant determinants for enhancing women's economic empowerment is an area which needs the attention of researchers in economics and management. Therefore, this is a contemporary study, on the determinant of women's economic empowerment for enhancing economic development of rural women. Since, majority of women are representing the rural poor segment of the society, this study makes an effort to study the determinants of economic empowerment among the rural women with a low income in Sri Lanka. Examining the relationship between determinants and women's economic empowerment will facilitate to uncover significant determinants of women's economic empowerment, to examine the women's financial awareness and decision-making power, and to examine the determinants on women's economic empowerment. Many researchers have already attempted to study women's economic empowerment in a local context (Jayamaha, 2008; Jayaweera, et al., 2007 Gunatilaka, 2013; Gunewardena, 2015; Herath et al., 2016; Vithanagama R, 2016 Vithanagama, 2016; Kumari 2020a). Nonetheless, they have not attempted to identify the determinants of women's economic empowerment in local context. Since there is an inadequacy of related literature, especially in the local context, the gap has to be bridged if efficient and effective strategies are to be developed as a strategy to enhance women empowerment in order to enhance the financial wellbeing of the rural women. Therefore, this study will focus on five determinants as the most influential determinant for enhancement in women's economic empowerment in Sri Lanka. Hence, the present study will provide insights into the body of knowledge on: economic decision-making power, control over the use of income and expenditures, control over the time allocation, leadership in the community, financial wellbeing and women's economic empowerment. Therefore, the outcomes of the study will be providing further advances in scientific knowledge in the fields of study and developing a structured approach to researching on women's economic empowerment phenomena for further research. Further findings of the study will facilitate the policy decision making within the country, with the purpose of improving economic empowerment in rural women in Sri Lanka. Therefore, the key objective of this study is to examine the most significant determinant to enhance the women's economic empowerment of rural poor women in Sri Lanka. Accordingly, five specific objectives were formulated.

1.2 Research Objectives

There are five objectives that the researcher is expecting to achieve through this study.

Objective 01 – To investigate the relative impact of economic decision-making power on economic empowerment among rural poor women in Sri Lanka.

Objective 02 – To investigate the relative impact of control over the use of income and expenditures on economic empowerment among rural poor women in Sri Lanka.

Objective 03 – To investigate the relative impact of leadership in the community on economic empowerment among rural poor women in Sri Lanka.

Objective 04 – To investigate the relative impact of control over the time allocation and expenditures on economic empowerment among rural poor women in Sri Lanka

Objective 05 – To investigate the relative impact of financial wellbeing on economic empowerment among rural poor women in Sri Lanka.

2. LITERATURE REVIEW

In Sri Lanka, the term empowerment is used in a wide array of literature ranging from academic papers and reports to development strategies and plans. However, an engagement with the definition of women's empowerment is missing, and appears to be taken for granted (IMF, 2015; ADB, 2008). Overall, women's empowerment is perceived as a desirable goal in areas ranging from the economic and social to the political spheres. In fact, Sri Lanka has committed itself to achieving gender equality long before it became a state party to UN Convention on the Elimination of All Forms of Discrimination Against Women (ADB, 2008).

In 1931, both women and men were granted universal suffrage. In 1947, universal free education from Kindergarten to University was made available. Health reforms from the 1930s culminated in the abolishment of charging user fees at government hospitals in 1951, creating universal access to healthcare. Propelled by such rapid growth in social welfare, Sri Lanka has achieved a lot in terms of women's status compared to many other developing countries (Malhotra & Mather, 1997). For example, women's literacy rate of 94.6 percent is only marginally below the men's literacy rate of 96.9 percent.

Moreover, women's educational attainments tend to be higher or at least on par with the educational attainments of men at higher levels of education. For example, in 2012, 13.7 percent of female students passed the General Certificate of Education Advanced Level examination compared to 10.9 percent of male students. Similarly, 2.7 per cent women obtained degrees in 2012, compared to 2.6 percent of men (Department of Census and Statistics, 2015). On the health front, female life expectancy at 79 years is higher than 72 years for men. The maternal mortality rate per 100,000 births has dropped from 61 in 1995 to 30 by 2018, among the lowest ratios globally (Medical Statistics Unit, Ministry of Health, Nutrition and Indigenous Medicine, 2018). Such macro level achievements in narrowing the gender gap is reflected in a Gender Inequality Index of only 0.78 for Sri Lanka (UNDP, 2018), a value that is stronger than in many other developing countries. However, a ranking of 80 at this index value shows that there is more to be done for women's empowerment. Blatant manifestations of gender discrimination in the form of female feticide or infanticide, dowry deaths or widow immolations are not reported in Sri Lanka (Jayaweera, et al., 2007). But glaring disparities do exist between women's social welfare and their economic participation. Despite commendable health and educational attainments, women's labour force participation rates have remained consistently low, hovering around 35 percent over the last decade (Gunatilaka, 2013; Gunewardena, 2015).

This could be, on the one hand, because the growth in Sri Lanka's economy has lagged behind the achievements in terms of social welfare (Malhotra & Mather, 1997). On the other hand, the lower economic participation among women indicates the persistence of gender norms towards work. A study on why Sri Lankan women do no translate their relatively high educational gains into labour force advantages (Gunewardena, 2015) indicates that while women and men have similar skill sets, these are not rewarded equally by the labour market, and that cultural norms in relation to the gender division of household work constrain women from entering the workforce. This is especially true for married women (Gunatilaka, 2013).

Even among employed women, the majority are concentrated in what is deemed to be 'feminine' areas of employment – as garment and textile workers, plantation workers and overseas migrant workers (Jayaweera et al., 2007), emphasizing the influence of gender norms in the labour market. At the other extreme, a study that estimates the earnings function for Sri Lanka from a gendered and ethnic perspective shows that even where women had superior labour market attributes, male average earnings are higher, entirely due to gender discrimination in favor of men (Arun & Borooah, 2011). This evidence clearly brings out the influence of gender ideologies in displacing the benefits of education in catalysing women's economic empowerment.

Although Sri Lanka has produced the first female Prime Minister as early as in 1960, and has had a female Executive President, the overall political participation of women in Sri Lanka is insignificant, and where women hold office, portfolios offered to them tend to be low-key (ADB, 1999; Herath, 2015). Iwanaga (2008) makes two observations on women's political participation in Sri Lanka. On the one hand, they are active voters, fundraisers and campaigners during times of election, but on the other hand, they are hardly present at the decision-making levels of the party structures. Thus, universal suffrage has in fact done little to change the status of the critical mass of women, beyond allowing them to vote (Ibid). The paucity of female representation at decision-making levels limits opportunities to address interests of women, and to instigate socio-economic transformations required to close gender inequalities.

Samarasinghe's (1998) study of the feminization of Sri Lanka's foreign exchange income provides a compelling example of how the absence of women at decision making levels leads to gender discriminations against women. The garment and textile sector, the tea industry and migrant labour, particularly to the Middle East, are predominantly female-labour driven. Yet, these women do not enjoy effective worker rights, suffer from long drawn hours, low wages, and minimal benefits. On the other hand, 'the state, by omission or by commission, seems to take the role of a bystander, rather than that of an active agent looking after the interests of its important foreign currency earning labour force-perhaps because employment in the Free Trade Zones and in domestic service is deemed to be temporary' (Samarasinghe, 1998). Access to resources, another key ingredient in women's economic empowerment, also shows gender biases in practice. Although, in theory, most customary laws in Sri Lanka allow women to enjoy equal inheritance rights with men over land, this may not necessarily be put into practice (ADB, 2008). The Land Development Ordinance (LDO) of 1935 that has been commended for its pro-poor approach for facilitating the allocation of rural lands for settlement and expansion to the landless has contributed to women's unequal access to land. Specifically, the inheritance schedules of the LDO had stipulated that if the allotted died intestate, only the eldest son could inherit the land holding (Alailima, 2000). The civil conflict has added another layer of complexity for women's land ownership in Sri Lanka. The application of the 'head of the household' concept, often understood as the male member of the family has resulted in discrimination against women in issues related to property and land ownership (Rai, 2014). Although empirical evidence on gender biases in Sri Lanka's formal credit market and access to other productive resources is limited, there are studies on the role of microfinance in women's economic empowerment. For example, Herath et al., (2016) found in their analysis that participating in microfinance programmes had a strong positive impact on a woman's ability to make decisions about the use

of credit, income generated from it as well as how it would be used. The thirty-year long armed conflict that Sri Lanka experienced until May 2009 has also had significant consequences for gender relations in Sri Lanka. The loss of over 70,000 lives in the conflict, displacement of over 1 million people, sometimes many times over due to both the conflict and the Tsunami disaster, disability, widespread destruction of property and assets, damages to infrastructure and losses of cultivable land (Arunatilake, Jayasuriya, & Kelegama, 2001; Ofstad, 2002) are some of the many negative consequence's women in the North and East of Sri Lanka have had to deal with during and in the aftermath of the conflict. Although displacement due to conflict has been common to men, women and children of Tamil, Sinhala and Muslim ethnic origins, the majority of the victims happen to be Tamil women. Life in displacement has disintegrated traditional gender roles for women, yet the new economic responsibilities have not been accompanied by opportunities for women's long-term empowerment (Bandarage, 2010). The return to gender status quo and the absence of sustainability of women's empowerment during conflict could be possibly because there is no culturally appropriate idiom to articulate and support women's transformed gender roles during peacetimes (Rajasingham & Senanayake, 2004). Disability often compounds women's barriers to social, economic and cultural empowerment. A study that looks at women with disabilities in the North Central and Eastern Provinces shows that women who had acquired disabilities due to the conflict were mostly confined to the home, and had no facilities or support to extend their agency beyond that (Samararatne & Soldatic, 2015). The lacuna of a gender dimension to post-conflict livelihood interventions has in many ways contributed to the reinforcement of traditional gender norms. For example, in the former North Eastern Province, women who have survived the conflict and experienced its trauma have expressed displeasure in having been removed from the planning process of the rebuilding process (Wanasundera, 2006). Moreover, the exclusive focus on war widows and female headed households has caused intervention programmes and projects to lose track of many other categories of women and their needs as well (Wanasundera, 2006). Still, the community induced barriers such as institutional factors (Thesawalamai law that allows women to own land, but not to exercise command over it) and sociocultural factors seem to play a more dominant role than any business (gender discriminations against women in business) or state-inflicted barriers (security phobia) in impeding women's economic empowerment (Sarvananthan, 2015). This shows once again that unless gender norms entrenched in a society are not transformed by conflict, there is little or no positive change a conflict brings about for women's overall agency.

While reviewing previous literature in the purpose of identifying the antecedents of women's economic empowerment, researcher did meta-

analysis and selected determinants which were commonly used in the previous studies. Accordingly, there were five main determinants identified. According to the previous literature, measurement indicators for the women economic empowerment can be measured by considering the situation of rural poor women in Sri Lanka. Therefore, as per the explanation in following section, some commonly adopted dimensions such as economic decision-making power, control over use of income and expenditures, leadership in the community, time allocation and financial wellbeing can be employed in the present study to measure economic empowerment of the rural women. Those indicators are validated by exploratory factor analysis. More specifically, the contribution of those determinants for enhancing women's economic empowerment is an area which needs the attention of researchers in economics and management. Therefore, this is an empirical study, which mainly focused on identifying main determinants of women's economic empowerment and attempt to excavate the most significant determinant among them.

3. METHODOLOGY

According to the Uma Sekaran there are two main research philosophies that can be adapted in the management research objectives as deductive and inductive. (Sekaran, 1992) However the deductive approaches based on theory develop the hypothesis based on the empirical evidence. Accordingly, present research has been designed as the deductive approach adapted from the positivism research paradigm. Further according to Leedy 1993 "that there are two main approaches qualitative and quantitative as per the empirical nature of the present research has been developed based on the quantitative approach" (Leedy, 1993). However as per the data requirement primary was collected. In this process primary data were collected based on a sample through the detailed self-administrated questionnaire. The questionnaire has developed based on the measurement instrument.

After considering geographical dispersion and characteristics of the target population, the multilevel mixed sampling method was utilized as the appropriate method for collecting data among rural poor women in Sri Lanka. The multilevel mixed sampling method involves several levels in selecting the sample and at each level, probability or purposive sampling method will be adopted. Accordingly, the sample selecting process for the study consists of four levels.

Level 01 – Dividing sample in to strata based on provinces in Sri Lanka

In the first stage of the sampling procedure, researcher divided the entire sample into 9 strata based on each province of the country. Therefore, the selected sampling method was stratified sampling. However, the target population was not equally distributed among each province and therefore, 426 respondents were proportionately divided based on the total number of rural poor women represented in respective provinces. Sample distribution among each province is given in table 1.

Table 1: Sample Distribution

Province	**Rural poor women (Target Population)**	**Calculation**	**Sample**
Western	30,968	30,968/338,203X426	39
Central	50,276	50,276/338,203X426	63
Southern	33,947	33,947/338,203X426	43
Northern	35,271	35,271/338,203X426	44
Eastern	44,068	44,068/338,203X426	56
North Western	31,645	31,645/338,203X426	40
North Central	20,791	20,791/338,203X426	26
Uva	34,314	34,314/338,203X426	43
Sabaragamuwa	56,923	56,923/338,203X426	72
Total Sample			426

Source: Estimated by the researcher based on survey reports (2018) of Department of Census and Statistics, Sri Lanka

Level 02 – Selecting divisional secretariat (DS) divisions in each province

In stage 2, the researcher selected 03 divisional secretariat (DS) divisions from each province with having the highest poverty ratio. The statistics about the poverty relevant to each DS division was taken from the household income and expenditure survey conducted by the Department of Census and Statistics (DCS), Sri Lanka in 2016. The DS divisions selected by assuming areas of highest poverty ratio are the best territories to collect relevant data, the selected sampling method is judgmental sampling.

Level 03 – Selecting one Grama Sevake (GS) divisions in selected DS division

In stage 3, the researcher selected one GS division with the highest poverty ratio. The data about the poverty level and number of households remaining under the poverty line was collected by respective DS office in each selected division. Further, required information was gathered by list of "Samurdhi" beneficiaries. Therefore, the judgmental sampling method was again applied in this stage.

Level 04- Selecting respondents within a location

After selecting GS division for data collection, enumerators were then advised to select respondents randomly. For this purpose, records of the GS office of respective divisions were considered. However, the respondents who fill the requirements of the sample were selected only by paying special attention to their demographic factors such as age, education, and occupation etc. Further, enumerators were advised to select respondents for representing the behavioural profile of the selected target population. Accordingly, data was gathered from 27 GS divisions and the final stage of the sampling procedure was adopted to the simple random sampling as a probability sampling method.

As questionnaire of the present study has selected Likert scale as the response formation to measure latent variables, data can be considered as categorical data. Therefore ±5% was adopted as the margin of errors in this research. Therefore, the minimum sample size was estimated as 384 based on Cochran's sample size estimating formula given below. It is more popular among social science researchers for determining the sample size for their surveys (Bartlett et al., 2001).

$$n = \frac{t^2 \times p(q)}{(d)^2}$$

n = minimum sample size
t = confidence level (at 95% - standard value of 1.96)
p(q) = estimated prevalence of variable (50% due to target population is estimated 338,203)
d = estimated margin of error (at ±5% - standard value of 0.05)

Even though minimum sample size was estimated as 384, it was noticed that the researchers have freedom to increase the estimated sample size based on the non-response rate of similar studies (Kline, 2011). However, the researcher observed that non response rate is at higher level in the case of researchers adopt to self-administrative questionnaires. The sample of the

study represents the rural women and it was identified that there are some limitations of adopting to self-administrative questionnaires in present research context. Therefore, the researcher decided to use researcher administrative questionnaires for the data collection process. Even though, Sekaran & Bougie, (2016) noted that non response rate is minimum in collecting data from researcher administrated questionnaire, the researcher decided to increase sample size by considering 10% contingency factor due to some possible missing data. Accordingly, the total sample size was calculated as (384/90X100= 426) 426.

Further, the researcher conducted exploratory factor analysis (EFA) to re-examine whether measurement items are accurately represented in the respective dimension of WEE. According to Hair, Gudergan, Ringle, & Sarstedt, (2018), Confirmatory tetrad analysis (CTA) was conducted to confirm the reflective nature of the WEE (see Annexure 01). The researchers employed the Smart-PLS 3 as the main analytical software.

Based on the exploratory factor analysis, there were five main determinants confirmed and used to design a conceptual framework as denoted in figure 1.

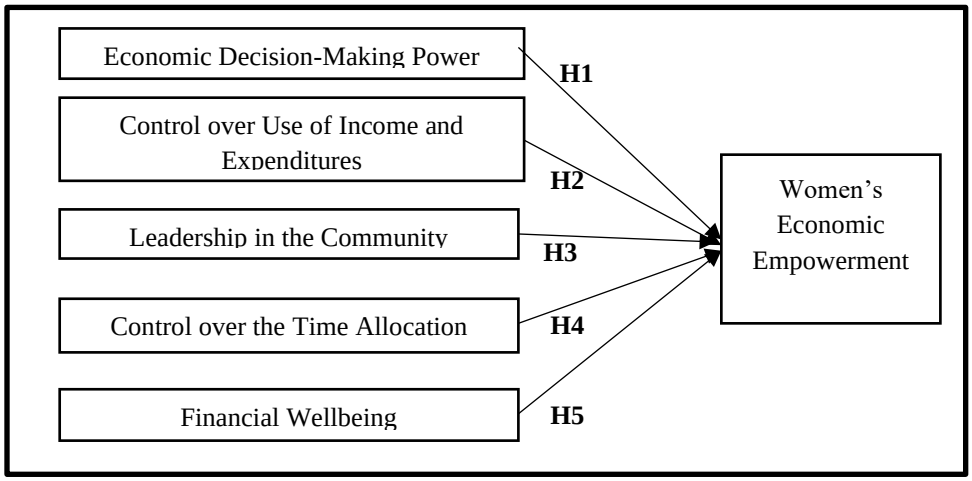

Figure 01: Conceptual Framework

3.1. Hypotheses

According to the conceptual framework, there were five main hypotheses formulated and tested. As per the research objectives those hypotheses were formulated and tested with the support of Smart PLS 3 software.

3.1.1. Economic decision-making power

Decision-making power is the ability to influence decisions that affect one's life – both private and public (Deka, 2015). Formal access to positions of authority and to this process is an important, if insufficient, condition for women to have decision making power in the public domain (Adam, et al., 2018; Islam, 2014). Decision-making power is a composite of access, capabilities and actions that shape whether women have influenced the society or their private life. While considering economic empowerment, the decision-making power consider under the financial point of view (Deka ,2015; Karunathilake, 2016). Therefore, in the research context, the decision-making power referred as, to the power of poor rural women to make household economic decisions for achieving short- and long-term economic wellbeing in their households Arora, 2016; Maheswari, 2016; Haque et al., 2016; Bonga et al., 2016; Singh et al.,2017; Lusardi et al., 2017; Roy et al 2018; Kumari et al., 2020b). According to the literature, researcher built first hypothesis as,

H1: There is a significant influence of economic decision-making power on women's economic empowerment among rural poor women in Sri Lanka.

3.1.2. Control over the use of income and expenditures

The next important issue is controlling over the use of income and expenditure. Without this step, will be spending money out of track. To control the income and expenditure, it is best to directly prepare the detailed document to control an income and expenditure, while developing the budget Alkire, et al., 2012; Biswas, 1999; Malhotra et al., 2002; Deka, 2015. The household budget should be communicated with all the relevant staff. Under the women's economic empowerment, controlling power of the income and expenditure of family members as well as controlling herself is an important phenomenon of her empowerment (Deka ,2015; Gilabert, Dietz, & Grabs, 2016; Soni, et al., 2016. Deka ,2015; Gilabert, Dietz, and Grabs ,2016). Therefore, in the research context, controlling the use of income and expenditure is termed as; authority and willingness of poor rural women to control the over expenditure of their families with the purpose of using these resources in productive ways. Karunathilake, 2016; Arora, 2016; Maheswari, 2016; Haque et al., 2016; Bonga et al., 2016; Lusardi et al., 2017; Singh et

al.,2017; Kumari et al., 2020a). By considering above literature second hypothesis was formulated as,

H2: There is a significant influence of control over the use of income and expenditures on women's economic empowerment among rural poor women in Sri Lanka.

3.1.3. Leadership in the community

Women have long been the mainstay of communities and are heavily involved in community initiatives in various forms. Though often the unrewarded heroes of community action, women's role in community development has become important (Dietz, & Grabs ,2016; Alkire, et al., 2012; Deka ,2015). Especially in some communities like rural poor, they have established themselves as leaders in community development and acquired the skills that have brought positive change to their communities. Women leaders play key roles in establishing and maintaining important relationships and networks in their communities (Gilabert, Gilabert, Dietz, and Grabs ,2016; Karunathilake, 2016). They face cultural, economics, and social barriers in leading the community and in many cases overcoming those barriers become their motivation. While their comprehensive approach has influenced the evolution and nature of community development, women's contributions have been neither widely acknowledging nor explicitly credited. The results of this study provide deeper insights into women's thinking about leadership and community development (Arora, 2016; Maheswari, 2016; Haque et al., 2018; Bonga et al., 2016; Singh et al.,2017; Lusardi et al., 2017). Therefore, according to the research context, leadership in the community means the extent to which poor rural women can influence the common decisions of community and degree of other community people willing to accept their views (Kumari,2017; Roy et al., 2018; Vithanagama, 2018). With respect to the existing literature the third hypothesis developed as follows.

H3: There is a significant influence of Leadership in the Community on women's economic empowerment among rural poor women in Sri Lanka.

3.1.4. Control over the time allocation

A study by Hoque and Itohara (2009) reported time allocation is contributing to an extent in planning family activities and participation in family leisure time based on the decision-making power of the rural women. And also stated that a time spending programme among family members is developing leadership of the rural women (Arora, 2016; Maheswari, 2016; Haque et al., 2016. This study was conceptualized considering basically five important dimensions of women's economic empowerment that identifies five principles

in which empowerment are achieved including control over the time allocation as an important dimension (Swamy,2014; Deka ,2015; Gilabert, Dietz, and Grabs ,2016; Karunathilake, 2016). Therefore, according to the research context, control over the time allocation means ability and willingness of poor rural women for allocating their time for different tasks and ability to decide their leisure time in between their day to-day work schedule (Bonga et al., 2016; Singh et al.,2017; Lusardi et al., 2017; Kumari, 2017; Roy et al 2018. With the existing literature fourth hypothesis designed as,

H4: There is a significant influence of control over the time allocation on women's economic empowerment among rural poor women in Sri Lanka

Another sub-dimension of the study is financial well-being, attributing to some extent in generating economic empowerment and participation in financial decision-making power of the rural women (Dash, Prasad & Koshy ,2016).

3.1.5. Financial wellbeing

Empowerment is power or authority to someone. Women are important to the family as a mother as well in a society. Women are working in the family without any compensation but in the workplace, they earn more money with their high position. Empowerment of women refers to giving decision making power to women in social, economic and financial empowerment of life (Haque, 2016; Gilabert, Dietz, and Grabs ,2016; Karunathilake, 2016; Arora, 2016;). Empowerment of women is very much essential to achieve sustainable development. The process of empowerment should start from the home. Women's position in the household determines women's autonomy in the family (Kabeer, 1999; Haque & Zulfiqar ,2016). According to the financial wellbeing, it is worth to examine whether can decide about household matters like buying household assets and managing financial resources, having access to bank, have security of financial future, have ability to make choices or have enough assets to do day to day financial transactions (Deka, 2015; Maheswari, 2016; Haque et al., 2016; Bonga et al., 2016). Therefore, according to the research context financial well-being referred as: ability of poor rural women to fully meet current and ongoing financial obligations and feel secure in their financial future, and is able to make choices that allow them to enjoy life. (United Nation Foundation ,2015; Biswas ,1999; Krishnan and Silvi,2011; Singh et al.,2017; Lusardi et al., 2017; Kumari et al., 2020c). Taking under consideration of above literature final hypothesis as designed as follows

H5: There is a significant influence of financial wellbeing on women's economic empowerment among rural poor women in Sri Lanka

4. RESULTS AND DISCUSSION

The structural model will have denoted the relationships among the main constructs in the conceptual framework by using path coefficients. Accordingly, the path coefficients represent the hypothesized relationships among the constructs in the model (Ringle et al., in 2018; Hair et al., 2018). The value for path coefficient should fall in between -1 and +1. When it tends towards +1, it is interpreted as strong positive relationship which is statistically significant and vice versa.

However, whether Path coefficient is significant or not depends on its standard error which can be obtained by considering two types of criteria. As bootstrap standard error enables to compute the ***t*** values and ***p*** values for all structural path coefficients, ***p*** value can be considered to assess significant level of path coefficients (Hair et al., 2017).

Generally, 5% significant level can be considered as the threshold level of ***p*** value, accordingly, ***p*** value must be smaller than 0.05 to demonstrate the significant relationship among constructs. Further, respective ***t*** value should fall in the range of - 1.96 to +1.96 to assure the significant level of path coefficients. Therefore, said condition can be considered as criteria 01. Moreover, Hair et al., (2018) suggest that researchers should check the bootstrap confidence intervals under the BCa approach in order to further test the significant levels of path coefficients, in the case of 1st criterion is not satisfied.

Accordingly, if the bootstrap confidence interval does not have a zero value, the path coefficient is still significant. It can be considered as criterion 02. The path diagram is given in the figure 02 and the summary of the statistics taken by bootstrapping techniques are given in table 2.

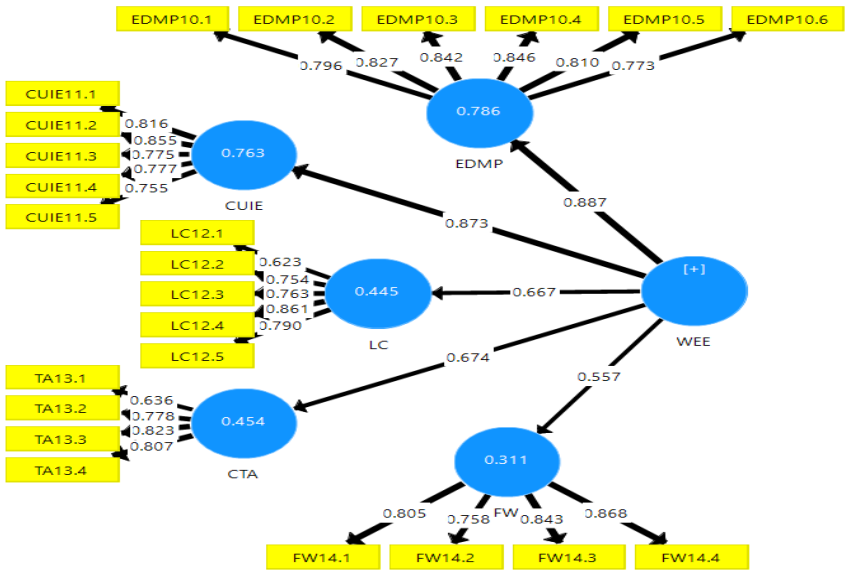

Figure 2: The relationship between determinants of WEE on WEE

Table 2: Determinants of Women's Economic Empowerment

	Beta	Sample Mean (M)	(STDEV)	T Statistics	P Values	2.50%	97.50 %	Hypotheses
EDMP-> WEE	0.887	0.888	0.012	73.868	0	0.861	0.909	H1: accepted
CUIE -> WEE	0.873	0.874	0.013	69.077	0	0.847	0.899	H2: accepted
LC -> WEE	0.667	0.667	0.037	18.134	0	0.583	0.737	H3: accepted
CTA -> WEE	0.674	0.670	0.040	17.049	0	0.575	0.741	H4: accepted
FW -> WEE	0.557	0.556	0.054	10.279	0	0.443	0.656	H5: accepted

Source: Author constructed based on the output results

Based on the Smart PLS output, hypotheses were tested and results summarized according to the respective hypotheses.

The individual path coefficients in the structural model and the table 2 represents the standardized Beta (**β**) coefficients in an OLS regression which express a one-unit change of the exogenous construct changes the endogenous construct by the size of the path coefficient while everything remain constant. However, whether path coefficients are significant or not should be determined by testing statistical criteria.

First hypothesis H1 considered, need to test the influence made by economic decision-making power on women's economic empowerment. According to table 2, It explained that path coefficient (**β** = 0.887) was reported as a positive impact of economic decision-making power on women's economic empowerment. Further, in terms of the other statistical values as: **p** = 0.000; **t** = 73.868; and Bca (Bias Corrected) confidence intervals lower = 0.861 and upper = 0.909, revealed that the determinant taken strong significance on the level of women's economic empowerment, the impact made by the economic decision-making power on women's economic empowerment was significant. Further, it was revealed that, among the set of determinants, economic decision-making power, is the most significant determinant of women's economic empowerment.

Therefore, H1 was accepted.

As per the second hypothesis (H2), it was tested the influence made by control over the use of income and expenditures on women's economic empowerment. According to the output results it explained as: slandered **β** = 0.873, it revealed that there is a strong positive influence made by control over the use of income and expenditures on women's economic empowerment; **p** = 0.000 means, probability value is with the threshold value (0.05); **t** = 69.077 explained high **t** value than 1.96; and Bca (Bias Corrected) confidence intervals lower = 0.847and upper = 0.899 (no zero laid between two confidence intervals), it confirmed that, the control over the use of income and expenditures significantly effects on the level of women's economic empowerment among rural poor women. While considering the significant variables of women's economic empowerment, control over the use of income and expenditures is the second most influential determinant of women's economic empowerment. Therefore, H2 was accepted.

As another highest path coefficient (**β** = 0.667), leadership in the community has a significant impact on women's economic empowerment. Further it was confirmed with the other statistical tests as well as: **p** = 0.000; **t** = 18.134; and Bca (Bias Corrected) confidential intervals lower = 0.583 and upper = 0.737

(no zero laid between two confidence intervals), it further confirmed that, there is a significant influence made by the leadership in the community on women's economic empowerment. Therefore, H3 was accepted.

With respect to the fourth hypothesis (H4) path coefficient (**β** = 0.674), control over the time allocation has positive influence on women's economic empowerment of rural poor women. Significance was further, revealed by the other statistical tests as well as: **p** = 0.000; **t** = 17.049; and Bca (Bias Corrected) confidential intervals lower = 0.575 and upper = 0.741 (no zero laid between two confidence intervals). Therefore, it elucidated that there is a positive significant influence of control over the time allocation of rural poor women with their economic empowerment. Hence, H4 was accepted.

Further, when it considers the last hypothesis, the path coefficient (**β** = 0.557) was reported in the path of financial wellbeing. That means there is a positive significant influence of financial wellbeing on women's economic empowerment. Further, in terms of the other statistical values as: **p** = 0.000; ***t*** = 10.279; and Bca (Bias Corrected) confidential intervals lower = 0.443 and upper = 0.565, revealed that there is a strong positive influence made by the financial wellbeing and it also was the significant determinant of women's economic empowerment. Therefore, H5 was accepted.

According to the output results, all **p** values are below 0.05 and all the ***t*** values are above 1.96. Therefore, all 05 hypotheses are empirically supported. The results further verified that there is no zero laid between lower confident interval and upper confidence interval. the most significant dimension of women's economic empowerment is economic decision-making power with highest ***t*** value (73.868) among the other determinants. The control over the use of income and expenditures was recognized as the second most influential variable of WEE. Financial wellbeing was identified as the least significant determinant due to the respective path coefficient has the lowest ***t*** value (10.279). In order to test the hypotheses, researcher formulated five hypotheses and all the hypotheses were empirically supported.

5. CONCLUSION

According to the research objectives, it is needed to examine the most significant determinant of the economic empowerment among rural poor women in Sri Lanka. As per the findings shared as in the above paragraph all the respective paths' coefficient is estimated as statistically significant. Therefore, the results demonstrate that all the five hypotheses were accepted and all the objectives were achieved. Therefore, the overall findings imply that all the determinants are significant and positively impact on the level of economic empowerment of rural poor women in Sri Lanka. Therefore, the

results further confirmed that objectives supported through literature as well as through empirical evidence in the present research context. According to the previous literature, women's economic empowerment is considered in different aspects but no one considered all the dimensions together to determine the women's economic empowerment. Moreover, there aren't any research studies which can be seen based on the identification of the determinants of women's economic empowerment in local context, where rural poor women are focused. Therefore, it can be concluded that present research is able to fill the literature gap emphasized by the researcher based on the relationship between determinants and women's economic empowerment.

Based on the findings, it was noted that the economic decision-making power has the highest significant contribution in developing women's economic empowerment among the rural poor women in Sri Lanka. The financial wellbeing is identified as the least significant determinant of women's economic empowerment. Therefore, it is a respectable indicator for the policy makers to pay more attention on the economic decision-making power as the highest significant factor for further improvements. It explained that women's decision-making power is in some substantial level, so this factor could be used to motivate them to more savings and investment within the household for enrich their financial wellbeing. Especially, the attention of policy makers should be focused on financial wellbeing as the least significant factor of women's economic empowerment to encourage that determinant to enhance the economic empowerment among the rural poor women in Sri Lanka. As per the researcher recommendations, the government should guide the financial institutions to encourage women's financial status while providing loan facilities targeting the rural poor self-employed women. Therefore, research findings could be useful for the policy level of the country to enhance women's economic empowerment. Based on research findings the policy makers could understand which aspect of determinants perform less but are important to determine the level of women's economic empowerment. For instance, findings of the study revealed that the least significant determinants as financial wellbeing. Ergo, policy makers should have focused on implementing some workshops on how to manage money, invest, etc. to enhance their financial skills. Further, this study provides a special contribution on existing literature and on the policy makers as findings provide a clearer understanding in significant determinants on women's economic empowerment. One of the main limitations in the study is, the research has only focused on the quantitative aspect. It is recommended for the future researchers to focus on qualitative data as well.

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Annexure 01 : CTA results

WEE	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values	Bias	CI Low	CI Up	Alpha adj.	z (1-alpha)	CI Low adj.	CI Up adj.
1: CUIE11.1,CUIE11.2,CUIE11.3,CUIE11.4	0.19	0.186	0.047	4.075	0	-0.004	0.117	0.27	0	3.566	-0.027	0.36
2: CUIE11.1,CUIE11.2,CUIE11.4,CUIE11.3	0.193	0.191	0.044	4.361	0	-0.003	0.123	0.269	0	3.566	-0.038	0.354
4: CUIE11.1,CUIE11.2,CUIE11.3,CUIE11.5	0.163	0.162	0.032	5.088	0	-0.001	0.112	0.217	0	3.566	-0.05	0.279
6: CUIE11.1,CUIE11.3,CUIE11.5,CUIE11.2	-0.068	-0.068	0.024	2.829	0.005	0	-0.108	-0.028	0	3.566	-0.154	0.018
10: CUIE11.1,CUIE11.2,CUIE11.3,EDMP10.2	0.049	0.047	0.025	1.969	0.05	-0.002	0.01	0.092	0	3.566	-0.038	0.14
13: CUIE11.1,CUIE11.2,CUIE11.3,EDMP10.3	0.054	0.052	0.03	1.809	0.071	-0.002	0.007	0.106	0	3.566	-0.051	0.163
17:	0.017	0.016	0.035	0.485	0.628	-	-	0.07	0	3.56	-	0.14

CUIE11.1,CUIE11.2,EDMP10.4, CUIE11.3						0.001	0.04	6		6	0.108	4
20: CUIE11.1,CUIE11.2,EDMP10.5, CUIE11.3	0.018	0.018	0.036	0.49	0.625	0	-0.042	0.078	0	3.566	-0.112	0.148
24: CUIE11.1,CUIE11.3,EDMP10.6, CUIE11.2	-0.067	-0.066	0.021	3.219	0.001	0.001	-0.102	-0.033	0	3.566	-0.142	0.006
27: CUIE11.1,CUIE11.3,FW14.1,CUIE11.2	-0.038	-0.038	0.022	1.709	0.088	0	-0.074	-0.001	0	3.566	-0.117	0.041
31: CUIE11.1,CUIE11.2,CUIE11.3,FW14.3	0.019	0.018	0.036	0.532	0.595	-0.001	-0.039	0.08	0	3.566	-0.108	0.149
36: CUIE11.1,CUIE11.3,FW14.4,CUIE11.2	-0.023	-0.024	0.021	1.121	0.263	-0.001	-0.056	0.012	0	3.566	-0.096	0.051
41: CUIE11.1,CUIE11.2,LC12.2,CUIE11.3	0.076	0.076	0.037	2.083	0.038	0	0.016	0.137	0	3.566	-0.054	0.207
46: CUIE11.1,CUIE11.2,CUIE11.3,LC12.4	0.076	0.075	0.035	2.167	0.031	-0.001	0.019	0.134	0	3.566	-0.048	0.201
52: CUIE11.1,CUIE11.2,CUIE11.3,TA13.1	0.035	0.038	0.025	1.43	0.153	0.003	-0.008	0.073	0	3.566	-0.056	0.12
59: CUIE11.1,CUIE11.2,TA13.3,CUIE11.3	0.222	0.22	0.043	5.119	0	-0.001	0.152	0.294	0	3.566	-0.069	0.377

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