



South Asian Journal of Finance

ISSN (Online): 2719-2547 | Journal Home Page: <https://sajf.sljol.info/>

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To cite this article: Werake W.M.M.S.K. and Dharmadasa P.D.C.S. (2025). Determinants of Financial Inclusion of Low-Income Households in Urban Sri Lanka (An Empirical Analysis Concerning Colombo District), *South Asian Journal of Finance*, 5(2), 125–143.

Determinants of Financial Inclusion of Low-Income Households in Urban Sri Lanka: An Empirical Analysis of the Colombo District

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ABSTRACT

Purpose: This study aims to identify the level of financial inclusion of low-income households and its determinants in Colombo District, Sri Lanka.

Methodology: Both descriptive analysis and logistic regression analysis are carried out using both primary and secondary data. Primary data were collected through a sample survey using a semi-structured questionnaire covering 383 households in Colombo district, and reports of government institutions have utilized for secondary data. Information gathered for nine variables i.e. age, gender, income, education, occupation, accessibility, availability, penetration, and trust.

Findings: The results of the descriptive analysis revealed that the level of financial inclusion is high in terms of access to finance, which is denoted by the number of account ownership in formal financial institutions, however, in terms of usage, it is quite low in the selected sample. Logistic regression analysis indicated that income, accessibility, availability, and penetration are the major determinants of financial inclusion in urban low-income families.

Originality: This research fills the long-standing gap in the literature by analyzing financial inclusion in urban low-income segment in Sri Lanka. Thus, it emphasizes the financial inclusion/exclusion is not only a rural phenomenon, and the urban poor need urgent attention compared to the rural sector as they are the most vulnerable in terms of financial needs.

Policy Implications: Therefore, the research urges that specially designed programmes and low-cost financial products and services are necessary for the urban poor to enhance their income factor and achieve greater financial inclusion among them.

KEYWORDS

Family Income, Financial inclusion, Logistic regression, Statistical Analysis, Urban Poor

JEL CLASSIFICATION

E42, E44

I. Introduction

The term ‘financial inclusion’ has gained considerable attention in global policy dialogues recently, owing to its development contributions. World Bank (2008) defines financial inclusion as the absence of price or non-price barriers in the use of financial services. The importance of financial inclusion in poverty reduction has been widely discussed by many researchers emphasizing how extended provision of financial services could have a substantial impact on poor households that are excluded from the formal financial system (IMF,

2018; Demirgüç-Kunt & Singer, 2017; Conroy, 2008; Arun & Kamath, 2015).

According to the World Bank (2017), about 1.7 billion people around the world are still excluded from the formal financial system, which generally refers to populations without access to standard financial services, i.e. savings accounts, loans & credits, cashless transactions, and other traditional banking services. Stephen (2001) emphasized financial exclusion as “the inability to access necessary information—financial services appropriately”. As emphasized in the literature, financial

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Received: 09 July 2025, Accepted revised version: 15 December 2025

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exclusion has two forms, i.e. voluntary and involuntary. Voluntary exclusion may occur for religious or cultural reasons or a lack of interest in financial services. Involuntary exclusion on the other hand, occurs due to barriers or constraints related to affordability, availability, inappropriate product design, and inability to achieve eligibility criteria (Abel et al., 2018)¹. Besides, the lack of infrastructure in some areas also often leads to financial exclusion. However, this exclusion poses a vital challenge to the population, as it refrains them from participating in the formal financial sector, which eventually prevents them from accessing the financial resources required for their life necessities (European Commission, 2008).

Financial exclusion of the most vulnerable segment of population is critical in this setting. Even though low-income people do not appear to be the most exciting target for profits, their exclusion from the financial system is not socially acceptable (Bhandari, 2018, Zins et al., 2016; Abel et al., 2018). For instance, the low-income population in urban areas compared to the rural sector is the most vulnerable as most of them are migrants. Even though many sources of formal financial services are available, some segments of the population are still unaware of those sources. They often do not turn to formal sector financial institutions for cash transactions and, hence, often miss the opportunities for efficient transactions. Therefore, their issues such as indebtedness, poverty & inequality, and low living standards continue as a cycle.

Considering the Sri Lankan context, financial exclusion is caused by constraints, that can be identified under three broad categories, i.e. demand-side constraints,

supply-side constraints, and regulatory constraints (Kelegama, 2014; National Financial Inclusion Survey (NFIS), 2018). In comparison to the rural population, urban counterparts seem the most affected in this regard. Poverty among the urban population tripled from 6 to 18 percent from 2019 – 2023 (The Economy Next, 2023). One of the efficient ways to get them out of the poverty trap is to introduce them to suitable financial services so that they will be able to fulfill their requirements. Besides, Sri Lanka is about to implement its National Financial Inclusion Strategy (NFIS), and therefore, investigating the level of financial inclusion in urban population would be an added advantage for a better implementation procedure.

The purpose of this study is twofold. First, it tries to identify the level of financial inclusion in the urban low-income population in Colombo district in Sri Lanka. Second, it examines the determinants of financial inclusion in the same population. The choice of research area is made based on two main factors. First, the Colombo district consists of the highest number of urban low-income populations. While gaining popularity for its commercial importance, it is also popular for its large slum area, which consists of a low-income population. Colombo remains diverse in terms of its ethnic mix, economic activities, and income disparities of the city population². Besides, the western province has the lowest bank account ownership of the urban sector in the country, even though it has leading information technology companies and financial institutions (CBSL, 2021). Thus, this appeared as an ideal place to research on urban financial inclusion.

Considerable number of studies have emphasized financial inclusion as a rural phenomenon, and therefore, many policies and programs have been designed mostly for rural poor. However, given the vulnerability

¹ This may also occur due to various reasons such as illness, irregular & low-income status, or not having the required identity to engage in businesses with the formal sector, and due to risk avoidance strategy of financial institutions, as they always look for low-risk customers, they are often reluctant to offer financial services for low-income population.

² About aim 50% of the city population lives in settlements that are in very poor condition, locally known as "under-serviced settlements."

of the urban poor, studies are needed to identify their level of financial inclusion and what makes them financially excluded. Research on financial inclusion related to the urban low-income segment is limited in number, so this paper fills that void by drawing attention to previously under-researched social groups in Sri Lanka. Besides, the findings of this study describe the true nature of financial inclusion in urban areas and constraints prevent them from accessing formal financial sector of the country. This will help policymakers to design suitable policy alternatives to enhance their financial inclusion through securing their creditworthiness.

The remainder of the paper is organized as follows. Section 2 brings a comprehensive review of previous literature to identify gaps in related research and section 3 gives a detailed description of the sample, data, and the methods of analysis used to achieve desired objectives of the paper. Section 4 discusses the findings of the research comparing related theoretical standpoints and empirical evidence. Section 5 provides conclusions and plausible policy implications with possible direction for future research.

II. Review of Literature

Theoretical Background

Among the various theories related to financial inclusion beneficiaries, the vulnerable theory of financial inclusion is most noteworthy here. The theory argues that financial inclusion programmes and activities should target the most vulnerable groups in a country such as low-income people, youngsters, women, and elders (Ozili, 2020). As emphasized in this theory, one way of achieving this is to enhance government-to-person (G2P) transfers toward the vulnerable groups and, thereby facilitate them to enter the formal financial sector by opening accounts and utilizing other related services. Considering the merits of this theory, first, it helps to reduce

the financial exclusion of vulnerable populations in the country by bringing them into the formal financial system. Second, it helps to identify the most vulnerable segment in the country, and their level of vulnerability, in which the government could understand the amount of transfer needed. Third, this is a cost-effective method that helps the government gradually increase the income status of vulnerable groups and gradually bring them to par with other social groups in the country³.

The Benefits of establishing greater financial inclusion for the entire population are also stressed by the theory of public good (Ozili, 2020). The theory emphasizes that no one should be left behind to get the desired growth outcome from the financial system. Several other theories related to financial inclusion can be found in the literature such as the theory of social learning, financial intermediation theory, and system theory of financial inclusion. However, detailed discussion about those was not provided here considering their suitability for this study. Nonetheless, the analysis of this study is basically constructed based on the vulnerable theory of financial inclusion.

³ However, there are some demerits also emphasized in the theory itself. First, since the theory emphasizes only the vulnerable groups, it cannot measure the level of financial inclusion in the entire population. This is a critical issue as there are people in other income segments who don't have connections with the formal financial system. Besides, focusing more on vulnerable people may hinder the growth of other sectors. To finance the vulnerable, high-income segments should be heavily taxed, which ultimately leads to efficiency loss and an increase in inequality if proper development policies are not implemented. Therefore, there is a precaution for the government when establishing social transfer networks for the poor. Moreover, institutions also have a responsibility when designing financial inclusion programmes, without neglecting the entire population in the country.

Empirical Evidence

Level of Financial Inclusion

Voluminous literature can be found related to financial inclusion that provides mixed results. Arun & Kamath (2015) examined financial inclusion, policies and practices and provided a global and regional perspective of financial inclusion. They use macro data to examine the attempt toward achieving financial inclusion and the need for a progressive approach to financial inclusion in India, South Africa, and Australia. Results have shown that voluntary participation is essential for improved financial inclusion. It has also stressed that Australia is one of the countries with higher financial inclusion. Nevertheless, some developing countries have significantly lower physical and digital access to banking and other services, therefore, the government should intervene in designing policies that better meet community financial needs.

Fungacova and Weill (2004) examined financial inclusion in twelve Asian countries, that are characterized by massive economic growth in the last decades. It has found that differences in access to finance, i.e. ownership of a bank account, savings in a bank account, and use of bank credit, generate different financial inclusion levels among countries. The main similarity identified here is that high motives for financial exclusion and alternative sources of borrowing. Financial exclusion is observed in all nations, and the lack of money is the most often cited reason for the exclusion. Similar findings are included in the study of Omar & Inaba (2020).

Determinant of Financial inclusion

Concerning single-country studies, Bapat & Bhattachatyay (2016) examined the determinants of financial inclusion of the urban poor in the Indian context, and have revealed that owing to the low savings, most of the urban poor are financially excluded. The study suggested that as the savings of

the urban poor are small, households should be allowed to open an account without any minimum balance restrictions and provide education on banking to enhance banking habits. The study of Iqbal and Sami (2017) investigated factors affecting financial inclusion and revealed that a gap exists concerning access to finance between privileged and underprivileged segments in India. They have identified factors such as place of residence, lack of legal identity, gender bias, limited knowledge of financial services, income levels, charges, rigid terms and conditions, and the type of business are major obstacles for financial inclusion.

Besides, Clámara & Tuesta (2014) emphasize that if individuals are employed, there is a higher probability of achieving financial inclusion. As emphasized by CGAP (2013), the reason for a high level of financial exclusion in many developing countries is due to a scarcity of employment opportunities. Thus, people's engagement with formal financial sector institutions is significantly diminished, leading to a heavy reliance on the informal sector. However, the study of Olit (2011) has found that there is no significant impact of employability on financial inclusion in Spain.

Investigating the impact of access, quality, and innovation, along with financial literacy, on financial inclusion in Nepal, Dangol & Humagain (2020) have confirmed that all the factors affect financial inclusion in Nepal. Further, the study has found that financial literacy has a moderate effect on financial inclusion in the country. In contrast, Cheronoh (2019) emphasized that ownership of mobile phones and demographic factors are significant factors that determine rural financial inclusion in Kenya.

As previously emphasized, studies related to Sri Lanka are limited in number, especially those that investigated financial inclusion in urban areas. Besides, a study focused on access to finance in Sri Lanka has pointed out that in Sri Lanka, it surpasses that of many other South Asian countries (Arora,

2010). The study asserted that state-owned banks in this setting achieved a remarkable outreach due to their variety of product offerings and government initiatives. Similarly, Madukala & Silva (2022) emphasized that poverty and income inequality in Sri Lanka have significantly reduced due to financial inclusion initiatives post-2009. Arunashantha (2019) also investigated individuals' perceptions of digital financial inclusion, which confirmed that accessibility is the most influential factor which encourages people to get into formal financial sector. Considering the barriers, Colombage (2010) explained that a low level of financial literacy is the main hurdle for financial inclusion in Sri Lanka. These findings were confirmed by Heenkenda (2014), who emphasizes that financial literacy is diverse within and genders. Kelegama (2014) also stressed the regulatory barriers to financial inclusion in Sri Lanka. Even though the above literature covers different angles, literature is limited in number. Therefore, more research is necessary to identify the level of financial inclusion in different segments of population. This study seeks to fill that void by focusing on the urban population in the country.

Hypothesis Formulation

The literature has confirmed that factors affect for financial inclusion are multifaceted. Based on the findings from the literature review, following research hypothesis was formulated for the current study to check whether those are relevant to urban community in Sri Lanka.

H1: Age has a significant effect on financial inclusion.

H2: Gender has a significant effect on financial inclusion.

H3: The education Level of the individual has a significant effect on financial inclusion.

H4: Occupation has a significant effect on financial inclusion

H5: Income has a significant effect on financial inclusion.

H6: Accessibility of financial institutions has a significant effect on financial inclusion

H7: Availability of financial products and services has a significant effect on financial inclusion.

H8: Penetration has a significant effect on financial inclusion

H9: Trust in financial institutions has a significant effect on financial inclusion

Detailed description of variables and methods utilized to test the above hypothesis are explained in the subsequent section of the paper.

III. Methodology

Research Design

This study used quant approaches to achieve its objectives, and in this setting, a combination of descriptive and statistical methods is utilized. Descriptive analysis is used to identify the level of financial inclusion in the selected area, and the statistical analysis is conducted to identify the determinants of financial inclusion in the selected area of study.

Data

Both Primary and secondary data were utilized for the analyses. Primary data was collected through a sample survey using a semi-structured questionnaire consisting of 65 questions. The initial section contains information related to the respondents' demographic characteristics⁴. The second section of the questionnaire contains information related to access to financial services⁵. The third section contains

⁴ Income, age, educational qualification, number of family members, gender, occupation, monthly expenditure.

⁵ Account ownership, type of bank, reasons for financial exclusion, account cancellation, financial inclusion of household.

information related to access to loans and credit services⁶. The fourth section contains information about transaction and payment services access⁷.

Secondary data was collected from the annual reports of the central bank of Sri Lanka, the reports issued by the Department of Census and Statistics, the reports of the Samurdhi Authority of Sri Lanka, and reports of the Colombo and Kolonnawa divisional secretariat. In addition, research reports, books, and journals related to research topics and other publications are utilized.

Study Area and the Population of the Study

The field of study is the Colombo district. The district consists of thirteen divisional secretariates (DS), and 557 Grama Niladari divisions (GN). A total of 662,408 families is registered in election roles, and the population of the study was all urban low-income families in the Colombo district. The researcher selected people who have already benefited from Samurdhi⁸ and expected to benefit Samurdhi in Colombo districts. According to, 77,419 households belong to the low-income category as population. Among the thirteen DS, Colombo and Kolonnawa have the highest number of low-income households, accounting for 8457 and 8354 households, respectively (Sampath Pathikada, 2021).

Considering the distribution of bank branches in the Colombo district, there are 226 branches of state banks and 165 branches of private banks respectively (Sampath Pathikada, 2021).

⁶ Bank loans, informal loans, the purpose of the loan, the constraint of accessing credit, reasons for rejecting credit requests.

⁷ Mode of receiving income, payment method of routine expenditure, usage of credit card, etc.

⁸ Samurdhi is the main and well-established social security program in Sri Lanka for the poor

Sample Design

The sample consists of 383 low-income households in the Colombo and Kolonnawa divisional secretariat⁹. Samurdhi beneficiaries and families that were registered to receive Samurdhi were selected as low-income households from the above DS division. A purposive sampling technique is utilized for the sample selection. The selection of respondents was done using a random sampling method.

When choosing the respondents, steps were taken to choose respondents from different occupations and age groups to have fair representation & make it easy to understand their financial situation¹⁰.

To understand the financial service provision, the distribution of private and state banks in the selected survey areas (Colombo and Kolonnawa) was observed and there were 42 bank branches. Hence, the authors had to consider all the related bank branches of Colombo and Kolonnawa divisional secretariat for the sample to collect information on financial service provisions. Based on Krejcie and Morgan table, 383 estimated respondents were considered as the sample size for the current study¹¹. The study period was July of 2022 to September of 2022.

⁹ Kolonnawa divisional secretariat consists of 44 GN divisions. The authors selected 08 GN divisions that consist of the highest low-income families. They are namely, Sedawatta (27), Orugodawatta (23), Meethotamulla (25), Wennawatta (26), Wellampitiya (12), Dahampura (23), Wadulla (25) and Sinhapura (24)

¹⁰ the sample consists of wage earners, construction workers, house helpers, sex workers, or any other activity that is labor oriented). Moreover, self-employed, auto drivers, street vendors, and all who provide various services such as hairdressing, laundry carpentry, and unemployed persons are also included in the sample

¹¹ Krejcie and Morgan (1970) also recommended that for a population having more than 75000 target groups, a sample size of 383 is acceptable.

Analytical Methods

The quantitative techniques were used for the analysis. A descriptive statistical analysis is carried out to find the status of financial inclusion of the respondents in the sample. Besides, the binary logistic regression method is employed to identify the determinants of financial inclusion among low-income families. Binary logistic regression analysis is a specialized regression formulated to predict a binary categorical variable¹². In this study, the intention is to identify the independent variables that impact the dependent variable, and the model assessed the probability of being either included or excluded from access to formal financial institutions. The financial inclusion considered by ownership of bank account was measured according to 0bank account. To check the determinant of financial inclusion, variables such as age (AG), gender (GEN), level of education (EDU), main occupation (OCCU), monthly income (INCM), accessibility (ACCB), availability (AVAB), penetration (PINE) and trust (TRUS) were considered. In this study, as independent variables, accessibility, penetration, availability and trust are measured using Likert scales questions. As example penetration was measured by their adequate number of bank branches and ATMs nearby. Accessibility was based on is it easy to reach the bank and convenient to use the bank products and services.

The following logit model used for the estimation of financial inclusion in the case of this research is specified as follows.

$$FI = \beta_0 + \beta_1 AG_i + \beta_2 GEN_i + \beta_3 EDU_i + \beta_4 OCCU_i + \beta_5 INCM_i + \beta_6 ACCB_i + \beta_7 AVAB_i + \beta_8 PINE_i + \beta_9 TRUS_i + u_i \quad (1)$$

¹² This model is appropriate when the dependent variable is binary (Hair et al., 2010)

IV. Findings and Discussion

Results of the Descriptive Analysis: Level of Financial Inclusion

This section highlights access to financial institutions, borrowing behavior, and modes of transfer & payments of low-income households in the sample.

Access to the Financial Services

Access to finance is measured by account ownership of formal banking institutions by individuals. Demirguc-Kunt et al. (2013) have mentioned that having a deposit or transaction account can serve as an entry point to the financial sector for individuals. Bapat and Bhattacharyay (2014) stated that one of the critical financial inclusion indicators is the proportion of households holding bank accounts. (refer to Table 1).

Table 1. Cross-tabulation of account ownership of the Head of the Household (%)

DS division	Bank s	Formal financial institutions	No account	Earlier have/not now
Colombo	23	10.7	17.8	0.6
Kolonna	21.2	8.2	14.1	4.2
wa				
Total	44.4	18.9	31.9	4.8

Source: Survey results, 2022

The survey results indicated that most of the samples own an account; thus, 44.4 percent have a formal one. Also, the number of formal bank accounts among low-income earners is higher in the Colombo divisional secretariat compared to the Kolonnawa divisional secretariat. 18.9 percent of the respondents have an account with a semi-formal financial institution. Considering the number of people who have a bank account in semi-formal financial institutions among the low-income earners, it is a unique feature that Colombo has a higher value than Kolonnawa.

As seen in Table I, 63.3 percent of the total respondents have a bank account or an account in a semi-formal financial institution. Also, 31.9 percent of the respondents do not have an account in formal, semi-formal, or any other institutions, and 4.8 percent had a bank account before but currently do not have any account ownership. Thus, it indicates that ownership of a formal bank account is somewhat high among heads of households of low-income earners. Considering the account ownership of the family members of the head of the household, many of them did not own an account in a formal financial institution (see Table 2)

Table 2. Distribution of account ownership of family members

Item	Frequency	Weighted %
Yes	143	40.4
No	211	59.4
Total	354	99.8

Source: Survey results, 2022

It revealed that 59.4 percent of household members of respondents do not have a bank account. Also, the remaining 40.3 percent have a bank account for at least one family member. Accordingly, it was observed that the banking access of the family members is relatively low.

Unintentional (involuntary) exclusion includes a lack of trust in the financial system or barriers such as affordability, availability, irrelevant product design, and inability to fulfill eligibility criteria (Abel et al., 2018). This survey also revealed that financial exclusion persists among low-income households (see Table 3).

Table 3. Reasons for financial Exclusion

Item	Frequency	Weighted %
Voluntary exclusion	self 28	7.9
Involuntary exclusion	self 102	28.9
Total	130	36.6

Source: Survey results, 2022

As shown in the table, 36.6 percent of the respondents do not have a bank account or an account in a semi-formal financial institution. Accordingly, it was observed that 7.9 percent of respondents do not have a bank account due to voluntarily refraining. This is basically due to religious and cultural reasons and, 28.9 percent have left voluntarily due to a lack of permanent income and insufficient income.

Type of Bank

Respondents were asked to indicate the type of bank they usually transact with, and it revealed that most of them have accounts in state banks (refer to Table 4).

Table 4. Distribution of banks among the respondents

Bank	Frequency	Weighted %
People's Bank	67	18.9
Bank of Ceylon	9	2.5
Commercial Bank	28	7.9
Sampath Bank	30	8.5
Samurdhi Bank	66	18.6
Other	25	7.00
Total	225	63.4

Source: Survey results, 2022

When investigating the type of bank where the accounts are held, it was revealed that most people have accounts in People's Bank (66) and Samurdhi Bank (66). It is 18.9 percent and 18.6 percent, respectively. Also, 8.5 percent and 7.9 percent, respectively, have bank accounts in Sampath & Commercial Bank, which are private banks.

2.5 percent of respondents, the lowest percentage, have opened accounts in the Bank of Ceylon, which is designated as a state bank. However, in total 76 state bank accounts were found. In addition, about 7 percent of people have opened accounts in other banks like Regional Development Bank, Hatton National Bank, NSB, and others.

Thus, financial inclusion in terms of access to finance is at a considerable level in the selected area.

Usage of Financial Services: loan and credit services

Borrowing Behavior

Arandara and Gunasekara (2021) have considered borrowing from a formal financial institution to indicate financial inclusion. Considering lending practices in this research, it has found that around 26.8 percent of respondents availed themselves of a loan, and around 73.2 percent have yet to take a loan from any financial institution (refer to Table 5).

Table 5. Preference for financial institutions for availing loan

Bank	Frequency	Weighted %
Government Bank (including Samurdhi Banks)	28	7.9
Private Bank	27	7.6
Other Saving institution	18	5.1
Microfinance / NGO	12	3.4
Pawnshop	10	2.8
Total	95	26.8

Source: Survey results, 2022

The data clearly shows that government and private banks are top-rated for borrowing. It is 7.9 and 7.6 percent of the loan amount, respectively. Considering the borrowing from the informal sector, it was clear that 2.8 percent borrowed from the informal sector. Borrowing from other sources, such

as mortgage centers and microfinance institutions, also remains low.

Purpose of Borrowing

As emphasized in the literature, the major reasons for borrowing were consumption and meeting day-to-day requirements (Bapt & Bhattacharya (2014). Similar findings can be observed here indicate that 24.2 percent used loans to purchase goods and services for consumption requirements (see Table 6).

Table 6. Distribution of purpose of borrowing

Item	Frequency	Weighted %
Purchasing and repairing the house	11	3.1
Loan repayment	44	12.4
Educational purpose	4	1.1
Health purpose	49	13.8
Buy goods and services	86	24.2
Others	21	6
Total	215	60.6

Source: Survey results, 2022

Besides, 14.9 percent are used for education and health purposes, and about 12.4 percent of the loans were taken from the informal sector to pay the interest and installments on the earlier loans. For enhancing urban financial inclusion as strategic it is necessary to formulate appropriate credit schemes based on the reasons. Besides, respondents were asked about the obstacles in accessing credit in the formal sector and the majority indicated that inadequacy of income is the major obstacle for them to obtain loans. As emphasized by them, financial institutions are reluctant to provide loans when they get to know individuals' income status (see Table 7).

Table 7. Distribution of Constraints of Availing Loan

Item	Frequency	Weighted %
Not adequate collateral	12	3.4
Not adequate income	324	91.3
Interest rate too high	6	1.7
Other	12	3.4
Total	354	100

Source: Survey results, 2022

91.3 percent of the respondents stated that inadequate income is the main obstacle to availing credit from the formal or informal sectors. Also, 5.1 percent stated that lack of adequate collateral and high interest rates are other obstacles to getting a loan.

Besides, the survey revealed that when asked the reasons for not applying for a loan from the formal sector, 27.9 percent of the respondents thought that they did not apply for a loan from the formal finance institutions because they did not have enough income to make regular payments. and 9 percent stated that they did not apply for loans because they did not know how to apply for a loan, and they thought that institutions would reject their loan applications considering their income status. These imply a lack of knowledge of how to obtain financial services and a lack of trust in formal financial institutions, which on the other hand, prevent people from financial inclusion. There is a need to develop a low-cost personalized distribution network for enhancing financial inclusion among urban poor.

Methods of Transactions and Payments

Matters were asked about access to transactions and payment services for the daily activities of low-income earners. The focus was mainly on how the customers get their income. It is revealed that 93 percent of respondents stated that their income is mainly received in cash than those using other methods. In addition, only 6.2 percent mention that their income is deposited

monthly in a savings account. A small percentage, which means 3 percent, stated that it is better if it is received as a check.

Considering their daily mode of payment, the survey finding reveals that despite the development of modern forms of payment, traditional forms payment, especially cash payment, have a strong position (see Table 8).

Table 8. Cross-tabulation of method of routine expenditures and age group (%)

Age	Cash	Cheque	Credit Cards	Debit card
18-30	1.1	0.0	0	0
31-45	24.8	0.0	1.1	0.3
46-60	52	0.3	2.0	0.3
Above 61	17.8	0.0	0.3	0
Total	95.7	0.3	3.4	0.6

Source: Survey results, 2022

Results indicate that 95.8 percent of respondents use cash for daily transactions and payment services. About 52 percent of those who used the money for transactions are in the age group between 46-60 years. Also, a significant number of young people still use money for transactions. About 24 percent of 31-45-year-olds still use cash for transactions. Also, 4.3 percent use debit cards, credit cards, and checks as modern forms of payment and transactions.

Method Transfer Money

Opinions were sought on the method used for sending or receiving money from one person to another (see Table 9).

Table 9. Distribution of method of transfer money

Item	Frequency	Weighted %
Bank	28	7.9
Post office	8	2.3
Internet	1	0.3
Money orders	1	0.3
Friend/ Family	30	8.5
With paid runner	1	0.3
Do not send/ receive money	284	80.0
Total	354	100

Source: Survey results, 2022

It is revealed that 80 percent of customers do not receive or send money from any person. However, 20 percent use different methods to receive and send money, 11.1 percent use traditional methods (friends/ family/ paid runner/ post office), and 8.2 percent use formal banking or online methods.

Credit and Debit Card Ownership

Paul Volcker (2009) said, “The most important financial innovation that I have seen in the last twenty years is the ATM.” However, in this study, the results show that 90 percent of low-income customers do not use credit and debit cards. It indicates that they still use cash for their payments and transactions.

The results of the descriptive analysis revealed that the surveyed low-income population has considerable amounts of account ownership, however, their loan usage is considerably low. Besides, the use of other financial products and services is also at a low level. Therefore, it can be said that the level of financial inclusion is low in the sample. This is mostly due to the demand-side constraints compared to the supply-side constraints. The obvious fact here is that the distribution of bank branches and products and services offered in the selected area are at a sufficient level, indicating no supply side constraints. However, irregular income of individuals

prevents them from accessing those services, thus indicate low level of financial inclusion. Therefore, unless we addressed those demand-side issues, inclusion of these people into the formal financial system would be somewhat difficult in the surveyed urban areas.

Since the results revealed that low level of financial inclusion, finding the determinants of it is also important. This is the second objective of this paper, and it is achieved through a logit regression analysis, which is presented in the subsequent section.

Results of the Logistic Analysis

In this section binary logistic regression analysis was performed to identify the determinants of financial inclusion in selected urban areas. Binary logistic (or logit) regression is often utilized to examine the impact of one or more predictor variables on the outcomes (Berkson, 1944). Since the model of this study has several categorical variables, utilization of logit regression would be ideal. As described in the methodology section, the dependent variable is financial inclusion, which denotes having a bank account in a formal financial institution. Independent variables are age, gender, level of education, family income, occupation, accessibility, availability, penetration, and trust. The estimated results are shown in Table 10.

Table 10. Binary logistic regression estimation results

Variables	B	SE	Wald	df	Sig.	Exp (B)	95% C.I for Exp(B)	
							Lower	Upper
Age			1.777	3	0.620			
Age (1)	0.648	1.252	0.268	1	0.605	1.913	0.164	22.267
Age (2)	0.845	1.243	0.462	1	0.497	2.328	0.204	26.611
Age (3)	0.419	1.254	0.112	1	0.738	1.520	0.130	17.738
Gender	-0.137	0.318	0.186	1	0.666	0.872	0.468	1.625
Level of Education			4.131	2	0.127			
Level of Education (1)	0.479	0.295	2.634	1	0.105	1.614	0.905	2.879

Level of Education (2)	0.724	0.429	2.849	1	0.191	2.062	0.890	4.779
Main Occupation			2.134	2	0.344			
Main Occupation (1)	-0.306	0.478	0.410	1	0.522	0.736	0.288	1.880
Main Occupation (2)	0.115	0.467	0.061	1	0.805	1.122	0.449	2.803
Family Income			9.582	3	0.022**			
Family Income (1)	0.745	0.408	3.325	1	0.068*	2.106	0.946	4.689
Family Income (2)	1.146	0.474	5.851	1	0.016**	3.146	1.243	7.961
Family Income (4)	1.524	0.530	8.275	1	0.004***	4.590	1.625	12.965
Accessibility			42.726	2	0.000***			
Accessibility (1)	-1.824	0.294	38.599	1	0.000***	0.161	0.091	0.287
Accessibility (2)	0.083	0.609	0.019	1	0.892	1.086	0.329	3.588
Availability			10.047	2	0.007***			
Availability (1)	-0.780	0.285	7.485	1	0.006***	0.458	0.262	0.802
Availability (2)	0.889	0.742	1.436	1	0.231	2.434	0.568	10.422
Penetration			6.364	2	0.042**			
Penetration (1)	0.827	0.468	3.119	1	0.077***	2.286	0.913	5.721
Penetration (2)	0.935	0.461	4.117	1	0.042**	2.548	1.032	6.287
Trust			0.516	2	0.772			
Trust (1)	-0.226	0.416	0.294	1	0.588	0.798	0.353	1.805
Trust (2)	0.203	0.516	0.155	1	0.693	1.225	0.446	3.367
Constant	-0.189	1.383	0.019	1	0.891	0.828		

*, **, *** represents 10%, 5 % and 1% significance respective

Source: SPSS result output, N=354

Based on the above table, the estimated model can be shown as follows.

$$\begin{aligned}
 \text{Logit (FI)} = & -0.189 + \\
 & 0.648AG(1) + 0.845AG(2) + \\
 & 0.419AG(3) - 0.137GEN + \\
 & 0.479EDU(1) + 0.724EDU(2) - \\
 & 0.306OCCU(1) + 0.115OCCU(2) + \\
 & 0.745INCM + 1.146INCM(2) + \\
 & 1.524INCM - 1.824ACCB(1) + \\
 & 0.083ACCB(2) - 0.780AVAB(1) + \\
 & 0.889AVAB(2) + 0.827PENE(1) + \\
 & 0.935PENE(2) - 0.226TRUS(1) + \\
 & 0.203TRUS(2)
 \end{aligned}$$

As presented above table, the age of household heads (categories 1,2,3), gender,

level of education (levels 1 & 2), main occupation (1, & 2), and trust are statistically insignificant, which can emphasize that these variables are less likely to affect financial inclusion in the selected population. Considering the age, owing to their low-income level and joblessness among age categories are high among them. So, they often do not tend to save in formal financial institutions. Similar observations can be found in previous literature as well (Arandara & Gunasekara, 2020; Beza et al. et al., 2020). However, the results contradicted the studies of Garg & Agrawal, (2014), who emphasized that a lack of trust causes financial exclusion.

However, the family income indicated a positive significant sign emphasizing that household income has a significant impact on financial inclusion in the selected sample. With a P value of 0.022. The odds ratio of 2.106 implies that low-income people who are 5,000 to below 15000 income categories are 2.106 times ($P=0.048$, CI: 0.946 - 4.689) more likely to be financially included compared to those in the income category below 5,000. Similarly, low-income people who are 15000 - below 25000 income categories, are 3.146 times ($P=0.016$, CI - 1.243 - 7.961) more likely to become financially included compared to those income below 5,000. Also, the odds of being financially included are 4.590 times greater when the income category is above 25000 than when the income category is below 5000 ($P=0.004$, CI - 1.625 - 12.965). Similar findings have been shown in related literature, i.e. Sarma & Pais (2011) highlighted the linked development of the country to its financial inclusion and measured the impact of income and inequality on inclusion.

Accessibility has also indicated a positive significance, with a 99 percent level of significance (P value of 0.000). Accessibility is also a categorical variable. This implies that those respondents who were neutral to easy access to financial institutions were 0.161 times ($P=0.000$, CI, 0.091 - 0.287) more likely to be financially included compared to people willing to access formal financial institutions. Also, results showed that people who disagree with dealing with formal financial institutions were 1.086 times more likely to become financially included compared to will people who are willing to access formal financial institutions. A study by Akudugu (2013) also confirmed that distance to financial institutions is a significant determinant of financial inclusion.

Further, the availability of financial services also revealed a positive significance at 99 percent confidence interval ($P=0.006$ CI: 0.262 - 0.802), confirming its influence on

financial inclusion. The odds ratio of this categorical variable of 0.458 implies that when low-income people have a neutral idea that formal financial institutions deliver financial services as per the needs of the customer, respondents are 0.458 times more likely to become financially included compared to people who agree that banking services are readily available. Similarly, the result implies that low-income people who are unhappy regarding the provision of bank facilities are 2.434 times more likely to be financially included compared to people who agree that banking services are readily available. Besides, studies by Sarma & Pais (2011), Dixit & Ghosh (2013), and Anand and Chikara (2013), all developed an index of financial inclusion consisting of availability as a dimension of financial inclusion.

Penetration also indicated a positive significant value (P value of 0.042). The odds ratio of this categorical variable, 2.286 implies that those who have neutral ideas about the service adequation of the formal financial institution are 2.286 ($P=0.017$ CI: 0.913 - 5.721) times more likely to become financially included compared to people who have agreed on the ideas regarding the service adequation. Similarly, the result explains that those who have disagreeing ideas about the service adequation of the formal financial institution are 2.548 times ($P=0.042$, CI: 1.032 - 6.287) more likely to become financially included compared to people who have agreed on the idea regarding the service adequation. Lal (2018) revealed that accessibility, availability and usage of financial services to be significant indicators of financial inclusion. The same goes with this study where all three factors, namely accessibility, availability and penetration have been identified as major determinants of financial inclusion with availability evidently carrying the most impact on financial inclusion. The policy makers should understand the demand of financial services throughout the regions and ensure proper availability and accessibility of the same for better inclusion

results. Thus, the decision of the hypotheses of this study can be summarized as follows.

Table 11. Summary of hypothesis test results using logistic regression

Hypothesis	Results/Decision
Age has a significant effect on financial inclusion	reject
Gender has a significant effect on financial inclusion	reject
Level of education has a significant effect on financial services	reject
Occupation has a significant effect on financial services	reject
Income has a significant effect on financial inclusion	fail to reject
Accessibility has a significant effect on financial inclusion	fail to reject
Availability has a significant effect on financial inclusion	fail to reject
Penetration has a significant effect on financial inclusion	fail to reject
Trust has a significant effect on financial inclusion	reject

The results have shown that out of the nine variables, four variables became significant implying that the income level of the households, availability of financial services, accessibility to financial services, and penetration are the major determinants of financial inclusion in the selected urban low-income people. Comparing the findings with the descriptive analysis, both analyses indicated that income plays a significant role in financial inclusion. Similar arguments are brought by previous empirical studies as well (eSarma & Pais, 2011; Vaid et al., 2020). Even though they are not related to the Sri Lankan context, they all emphasized the importance of income in determining financial inclusion. As indicated by the results, even though availability, accessibility of financial services and bank penetration are quite high in the selected urban area, having low income seems prevent the community from formal financial services.

These results cannot be coherent if the utilized model and the variables have issues.

Thus, several model stability tests are also conducted to confirm the findings, and the results are explained in the subsequent section of the paper.

Tests of Model Stability

Like other multivariate data analysis techniques, major assumptions or diagnostic tests were performed to check the validity of the data for the current binary logistic regression model. Accordingly, diagnostic tests such as multi-collinearity, omnibus test, and the Hosmer and Lemeshow test were used to check model fitness¹³.

A multi-collinearity test is conducted to check whether independent variables are correlated among themselves or not. Accordingly, in this case, the tolerance and VIF values are within the expected range, proving the absence of multi-collinearity¹⁴. Besides, the omnibus tests of model coefficients provided an overall explanation of how well the model performed. The test result shows significance at the 1 percent level. The other statistical measure is Hosmer and Lemeshow's measure of overall fitness. This test examines the correspondence of the actual and estimated values of the dependent variable. However, the chi-square value for the Hosmer - Lemeshow test is 9.234 with a significance level of 0.323¹⁵.

The most used estimation of overall model fit in logistic regression is the likelihood ratio test. According to the model summary, we can see that the -2 log-likelihood statistic is 356.659. Also, nagelkerke's R^2 , which is

¹³ All results of the stability tests are in Appendix I (Table 1, 2, 3)

¹⁴ Tolerance values should be higher than 0.2, and variance inflation factors (VIF) should be less than 5.

¹⁵ The Hosmer - Lemeshow statistic indicates a poor fit by a significant value of less than 0.05, showing the existence of a significant difference between the observed and predicted values to support our model. This value is greater than 0.05, which supports the model.

an adjusted scale of the statistic, indicates 0.362 emphasizing 36.2 percent of variation explained by the model. Cox & Snell R² attempts to imitate multiple R² based on likelihood. The results of Cox & Snell R² indicate that 26.5 percent of the variation in financial inclusion is explained by the predictor variable which is assumed to be good enough.

The classification table indicates how well the model can predict the correct category once the predictors are added to the study. We can compare this with the classification table shown for block 0 to see how much improvement there is when the predictor variables are included in the model. The model correctly classified 76.3 percent of cases overall. Also, this is the correct classification rate if we always predict that a respondent would have a bank account in a formal banking institution. It especially presents information on the degree to which the observed outcomes are predicted by the model.

The overall accuracy rate was very good at 76.3 percent. The model exhibits good sensitivity since among those people who will not have a bank account in a formal financial institution over having a bank account, 86.6 percent were correctly predicted to have not bank account based on the model.

V. Conclusion

This study tries to achieve twofold objectives which are to understand the existing level of financial inclusion in urban low-income families and, to identify the determinants of financial inclusion in low-income households in the Colombo district in Sri Lanka, depending on both primary and secondary data. Financial inclusion is conceptualized by access and usage of financial products and services. A descriptive analysis and a logistic regression analysis are carried out to achieve the desired objectives.

The results indicated that urban financial inclusion is at a satisfactory level in terms of access to finance, which is denoted by the number of account ownership in formal financial institutions. However, the usage of financial products and services, which is explained by the usage of loan facilities, and payment & transfer facilities, is at a low level. Considering both, the study concludes that the level of financial inclusion is low in the urban low-income population.

Logistic regression results have indicated that family income, accessibility, availability, and penetration are the main determinants of financial inclusion in the selected low-income families. Comparing both descriptive and logistic regression results, it appears that household income plays a significant role in financial inclusion, which is generally true, and admissible fact relates to every society.

Based on these findings, several policy implications can be highlighted. First, as policy makers Government, financial authority and as service providers formal financial institutions should prioritize income enhancing programs for the urban poor to increase their inclusiveness in the formal financial system. Second, financial institutions should facilitate specially designed financial products and services at an affordable cost to the low-income segments, especially loans to start income generating activities. Besides, they can use various methods and products that are user-friendly to low-income people in which they can willingly access formal financial services. In addition, increasing awareness programs of financial products and services among the urban poor is highly necessary as most of the financial institutions focus on the rural sector and, hence, often neglect the urban poor. It is noteworthy here that the urban poor are more vulnerable than the rural poor and social issues arise in urban areas due to this vulnerability is higher than that of the rural sector. Therefore, they should be prioritized when designing

policies related to financial product and services delivery.

To the end, this research was limited to one district in Sri Lanka; hence generalization of the outcome may not be possible. A country-wide study is needed in this setting to make national policies to enhance financial inclusion in Sri Lanka.

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Appendices

Results of the Munti-collinearity Test

Model	Collinearity Tolerance	Statistics VIF
Age	0.946	1.057
Gender	0.956	1.047
Level of education	0.910	1.099
Main occupation	0.968	1.033
Family income	0.865	1.157
Accessibility	0.788	1.270
Availability	0.910	1.099
Penetration	0.879	1.138
Trust	0.916	1.091

Source: SPSS result output, 2022

Table 54: Omnibus Tests of Model Coefficients				
		Chi-square	df	Sig.
Step 1	Step	108.827	19	.000
	Block	108.827	19	.000
	Model	108.827	19	.000

Table 55: Hosmer and Lemeshow Test			
Step	Chi-square	df	Sig.
1	9.234	8	.323

Table 56: Contingency Table for Hosmer and Lemeshow Test						
		Account Ownership /or not = No		Account Ownership /or not = Yes		Total
		Observed	Expected	Observed	Expected	
Step 1	1	32	30.015	4	5.985	36
	2	25	25.079	10	9.921	35
	3	19	20.303	16	14.697	35
	4	13	15.616	22	19.384	35
	5	13	11.880	22	23.120	35

	6	11	9.410	24	25.590	35
	7	6	7.108	30	28.892	36
	8	2	5.312	34	30.688	36
	9	7	3.383	28	31.617	35
	10	2	1.893	34	34.107	36