THE ASSOCIATION BETWEEN TIME POVERTY AND INCOME POVERTY: THE CASE OF SRI LANKA

H G Vithanage

P M Dunusinghe

Sri Lanka Journal of
Economic Research
Volume 10(2) February 2023
SLJER 10.02.04: pp. 71-95
Sri Lanka Forum of
University Economists
DOI:http://doi.org/10.4038/sljer.v10i2.184

Abstract

Considering the significance of both time and income in determining the wellbeing of people, this study aims to examine the association between time poverty and income poverty in Sri Lanka by employing the first ever Time Use Survey (TUS) of Sri Lanka, along with the Labour Force Survey (LFS). A descriptive analysis and a binary logistic regression analysis are conducted. The study reveals time poverty in Sri Lanka to be an issue mainly concerning income non-poor people than income poor people, out of which, income non-poor females are found to be more time poor than income non-poor males. Further, that the highest proportion of people in Sri Lanka fall into the scenario of being time poor and income non-poor, followed by those who are both time non-poor and income non-poor (better-off), and those who are both time poor and income poor (worse-off). Finally, a logistic regression of time poverty reveals a significantly negative association between time poverty and income poverty in Sri Lanka, thus reflecting a trade-off between the two. Consistent with existing literature, this finding provides insights on how most people in Sri Lanka escape income poverty only at the cost of incurring time poverty by sacrificing their self-care and leisure time, which is a major issue of concern.

JEL: *J22, C35, I32*

Keywords*: Time poverty, Income poverty, Labour Market, Logistic regression, Sri Lanka*

H G Vithanage
Department of Economics, Faculty of Arts,
University of Colombo, Sri Lanka.
Email: himagavi@gmail.com
https://orcid.org/0000-0001-7336-3097

P M Dunusinghe (Corresponding Author)
Department of Economics, Faculty of Arts,
University of Colombo, Sri Lanka.
Email: dunusinghe@econ.cmb.ac.lk
https://orcid.org/0000-0002-2225-711X

INTRODUCTION

Income is considered as the traditional unidimensional measure of poverty and wellbeing, hence is the most widely used indicator of poverty. Currently, around 9 per cent of the global population suffers from poverty,[1] out of which the largest proportion is from Sub-Saharan Africa and South Asia. And in the context of Sri Lanka, an estimated 14.3 per cent of the country's population suffers from poverty.[2] Although income is an important dimension of poverty, there are many other aspects of poverty which are also important since the concept of poverty realistically has multidimensional aspects to it. Therefore, income alone does not sufficiently reflect the level of wellbeing of an individual or household. Considering the fact that time is an essential and valuable economic resource which is limited in nature, time is one such important dimension of poverty which has gained recognition in the recent past.

Individuals broadly allocate their time on income earning, domestic activities and self-care/leisure. While all three of these requirements on time are vital in determining the overall wellbeing of an individual or household, the fact that time is limited in nature has given rise to the recent development of the concept of time poverty. Accordingly, time poverty is regarded as "an important welfare indicator which describes a situation in which one works a greater number of hours than is desirable. It is the direct result of the intra-house allocation of time to competing activities such as paid work, unpaid work, and personal care" (Orkoh et al., 2019). When considering employed people, in addition to the time spent in the labour market for monetary gains, they have many other requirements on their time which include unpaid domestic work such as home production of goods and caring for children/elderly etc. These demands on time may reach a point where people do not have adequate time available to spend on personal development activities such as self-care, leisure, and education, thereby causing them to be categorised as time poor.

Considering how the empirical estimation of time poverty is a recent phenomenon, no estimates for time poverty exist in the global context so far due to the limitation of time use data. Nonetheless, estimates exist at the national level for most of the developed countries and several developing countries. Accordingly, with the recent availability of time use data in Sri Lanka, Ranatunga and Dunusinghe (2021) has estimated around 40 per cent of people in Sri Lanka to be time poor, revealing that a sizable number of individuals overwork by sacrificing their leisure time which is ideally meant to be spent

[1] The international poverty line to measure extreme poverty as defined by the World Bank is USD 2.15 a day and it is estimated that around 9 percent of the global population are living in extreme poverty, while around 20 percent of the global population live below the higher poverty line of USD 3.6 a day in 2021 (Suckling et al., 2021).

[2]Note that this figure is based on the updated poverty line of LKR 6,966 per person per month for 2019 (based on 2012/13 on NCPI). Accordingly, in 2019, 14.3 percent of people in Sri Lanka lives below this updated poverty line.

on personal care. This situation of sacrificing self-care and leisure time in order to earn more income, is an indication of the possible close connection or association between time poverty and income poverty.

Since both time and income are vital determinants of household and individual wellbeing, and hence important dimensions of poverty, examining the association between time poverty and income poverty has gained considerable attention recently. As such, based on several studies conducted in other countries, two perspectives exist with respect to the relationship between time poverty and income poverty. According to one perspective, there is a positive association between the two due to the direct substitutability between time and money, indicating how a lower level of income poverty may result in a lower level of time poverty (Orkoh et al., 2019; Saqib and Arif, 2012). Contrastingly, another perspective highlights a trade-off between time poverty and income poverty, where certain individuals are significantly constrained by both time and income such that they can escape income poverty only by incurring time poverty, or vice versa (Orkoh et al., 2019; Burchardt, 2006).

Correspondingly, four possible scenarios or groups exist with respect to different combinations of time poverty and income poverty, and if stated briefly these four scenarios are: (1) being both time non-poor and income non-poor; (2) being time poor and income non-poor; (3) being time non-poor and income poor; (4) being both time poor and income poor. Out of these scenarios, the fourth scenario is the most extreme and worst scenario as it depicts a situation where individuals are poor with respect to both dimensions of time and income. Taking into consideration the significance of both time and income in determining the wellbeing and overall performance of a country, and the fact that no research has yet been conducted on this area in the context of Sri Lanka, this study aims to examine the association between time poverty and income poverty in Sri Lanka as it has important implications on the development process of the country.

LITERATURE REVIEW

Vickery (1977) who first developed the two-dimensional measure of poverty incorporating time and money postulated how for a household to reach the poverty threshold they require “a minimum amount of time regardless of the amount of money available, and a minimum amount of money regardless of the amount of time available”. As a result of the consequent recognition received on time and money as two main resources that determine wellbeing, subsequent studies attempted at examining the relationship between time poverty and income poverty, so as to identify the interdependence and/or the trade-off between time poverty and income poverty (Orkoh et al., 2019). Accordingly, two strands of literature exist with respect to the relationship between time poverty and income poverty. One view supports a positive association between the two types of poverty such that high income poverty would mean high time

poverty, whereas the other view supports a potential trade-off between the two such that high income poverty would be associated with low time poverty and vice versa (Burchardt, 2008; Merz and Rathjen, 2009; Orkoh et al., 2019).

The strand of literature which supports a positive relationship between time poverty and income poverty is associated with the direct substitutability between time and money due to the fact that time can be purchased (Orkoh et al., 2019; Saqib and Arif, 2012). This implies how individuals or households with high levels of income could use their earned incomes in purchasing time saving devices and/or hiring services of other people such as caretakers, housemaids, servants etc. for the purpose of carrying out their household activities, which thereby makes such high-income individuals or households less susceptible to time poverty because they have adequate time available for self-care and leisure. In line with this view, Zacharias et al. (2014) reveals how time poverty is higher among income poor households compared to income non-poor households in Korea.

In relation to the trade-off hypothesis, one notion explains how employment would increase the time allocated for committed activities[3] while limiting the time available for self-care and leisure, thereby causing an individual to be time poor (Saqib and Arif, 2012). As such, individuals who work to earn income to meet the minimum income poverty threshold have to devote additional time for domestic work, thereby making them more susceptible to time poverty (Orkoh et al., 2019). This implies how a person who escapes income poverty through employment could fall into time poverty, thus justifying the negative association or the trade-off between time poverty and income poverty. In line with this notion, Burchardt (2008) who employs the UK Time Use survey of 2000 in examining time and income poverty in the UK, finds how certain individuals are significantly constrained by both time and income such that they can avoid income poverty only at the cost of incurring time poverty, and vice versa. While Burchardt (2008) reveals that most people have to face this trade-off, the author has also found evidence on a segment of people in the UK who appear to be time poor but have the potential to be non-time-poor by reducing their time spent in the labour market, without incurring income poverty [4]. Orkoh et al. (2019) in their study on examining the relative effects of income and consumption poverty on time poverty in Ghana, finds a negative impact of income poverty on time poverty, where an income poor individual was found to be 3 per

[3] In their study, Saqib and Arif (2012) refer 'committed activities' to be the activities that an individual is committed to perform as his/her economic or social responsibilities. These activities include work carried out in the labour market to earn income (paid work) and the household/domestic activities (unpaid work) such as home production of goods for consumption, caring for children/elderly etc. Accordingly, the time spent on such committed activities are considered to be non-free minutes that contribute to an individual's time poverty.

[4]This evidence on time poor people who have the potential to be out of time poverty by reducing their working time, can be related to the 'time pressure illusion' concept of Goodin et al. (2005) who asserted that the feeling of time pressure (time poverty) of people is mostly discretionary and of their own choice.

cent less likely to be time poor when compared with an income non-poor individual in Ghana.

Labour-Leisure Model and Time Poverty

There are two possible uses of time, namely labour and leisure. It is assumed that an individual selects the combination of hours of work and leisure that maximises his/her level of satisfaction or utility. In general, individuals choose not to work if the value of leisure time exceeds the market wage. An individual's utility level is a function of two goods: real income (Y), and leisure time (L). Mathematically, the utility function could be expressed as:

$$U = \int(Y, L) \tag{1}$$

Individuals attempt to attain the highest possible level of utility subject to two constraints, namely time constraint and goods constraint. Time constraint is given by:

$$T = H + L \tag{2}$$

Where T, H, and L stand for total time availability, hours of work, and hours of leisure respectively. Goods constraint could be expressed as follows:

$$wH = pY \tag{3}$$

Where w stands for wage rate and p and Y stands for price index and real income respectively. Combining the two constraints, full-income constraint could be expressed as follows:

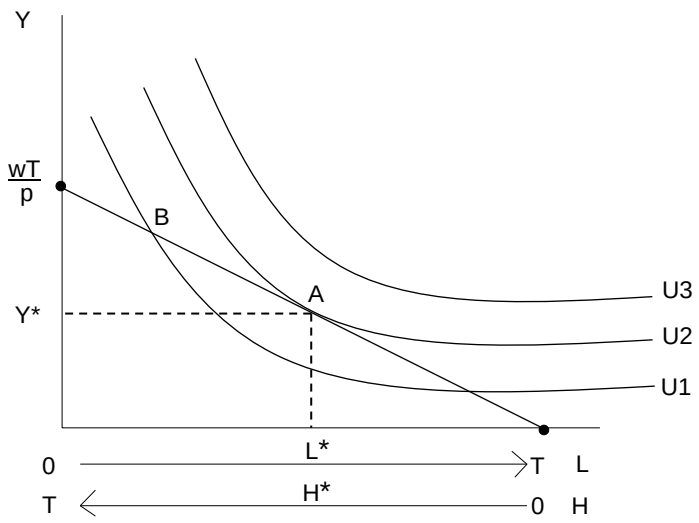
$$wT = pY + wL \tag{4}$$

Full-income constraint equals the total explicit cost of goods and services plus the total implicit cost of leisure time. Accordingly, an individual maximises his/her utility subject to the full-income constraint and decides the hours of work and leisure. In the context of time poverty, hours of work include both paid hours of work in the labour market and unpaid hours of work in the domestic sphere which either earn an income or avoid incurring a cost. Leisure includes his/her time utilised for various non-income earning activities such as sleeping, recreation, and self-care. Time poverty occurs when individuals are forced to allocate excessive hours of work which is sub-optimal from the utility maximisation point of view.

In Figure 1, indifference curves are denoted by U, where indifference curve U_2 provides the combination of labour-leisure that provides higher utility compared to indifference curve U_1. Point A in indifference curve U_2 denotes the utility maximising allocation of

time. Alternatively, point B on indifference curve U_1 depicts a sub-optimal allocation of time where individuals work (paid work and unpaid work) more than the optimum level of H* thereby reducing his/her utility or overall welfare. In other words, excessive use of time for work causes time poverty. There could be two groups of individuals: (a) time poor but income-wise non-poor and (b) time poor as well as income-wise poor. In particular, sense of income poverty could motivate individuals to allocate more time for work thereby leading to time poverty. Some individuals cross the income poverty threshold (i.e. become income-wise non-poor due to excessive use of time for work) while some individuals fail to cross the threshold (i.e. become poor though time is allocated for work excessively). This theoretical framework provides the basis for the empirical analysis of this paper.

Figure 1: Indifference Map and Budget Constraint



DATA AND METHODOLOGY

Data and Data Sources

This study utilises secondary data from the Time Use Survey (TUS) and Labour Force Survey (LFS) of 2017 conducted by the Department of Census and Statistics of Sri Lanka. The Time Use Survey of 2017 is the first ever national survey of its kind in Sri Lanka. This survey was conducted nationwide in a representative manner and includes the same households that were used in the fourth quarter Labour Force Survey (LFS) sample in 2017. The sample considered in the analysis consists of 4,316 employed individuals from 2,830 households, who are either employees, employers, or own account workers.

Defining Poverty Thresholds

As there is no general agreed level of 'minimum' time required by an individual to avoid being time poor, there is no official poverty line for time unlike for income. Therefore, it is necessary to define a time poverty line/threshold for Sri Lanka. For this, the activity categorisations of the Sri Lanka Time Use Survey (TUS) should be given attention. The Sri Lanka Time Use Survey divides activities into three major categories consistent with the International Classification of Activities for Time Use Statistics (ICATUS 2016), namely, SNA activities[5] which include employment and home production of goods for own use; non-SNA activities[6] which include unpaid work such as domestic activities, caregiving, and volunteer work; non-productive activities which include learning, socialising, leisure, and self-care activities.[7]

Out of these three broad categories, if an individual spends time beyond a predetermined time limit in activities which fall under the first two categories, SNA and non-SNA activities, then he/she is considered as a time poor individual in this study since he/she does not have adequate time available to engage in other activities such as self-care, education, leisure and socialising. In order to clearly classify individuals as time poor or time non-poor, a time poverty threshold, as estimated by Ranatunga and Dunusinghe (2021) for Sri Lanka, has been utilised in this study. The threshold is estimated as 1.5 times the median time spent in SNA and non-SNA activities by all adults aged 15 years and above.[8] Based on this methodology, the time poverty line for Sri Lanka, as computed by Ranatunga and Dunusinghe (2021), is nine hours per day for an individual. Accordingly, an individual is categorised as time poor if he/she spends more than nine hours per day on SNA and non-SNA activities.

$$Time\ poverty\ threshold = 1.5 \times Median\ time_{SNA+NonSNA} \quad (5)$$

In contrast to time poverty, defining the income poverty threshold is more straightforward. As such, the updated official poverty line for 2017 (based on 2012/13) adjusted by NCPI has been utilised as the income poverty threshold in this study. Based on this official poverty line, an individual is considered to be income poor if he/she has a monthly income below LKR. 6,588.

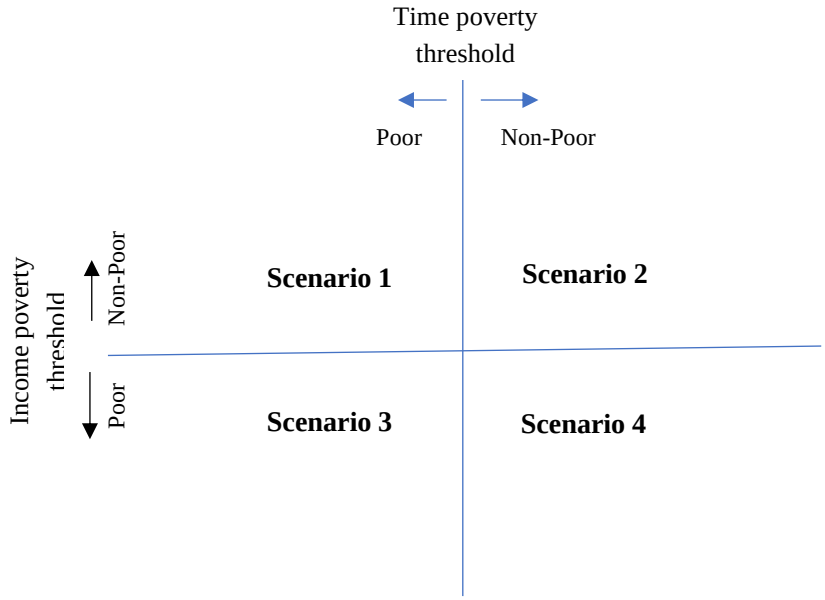
[5]Activities that fall into the System of National Accounts (SNA) production boundary
[6]Activities that fall outside of the SNA production boundary
[7]As identified by the Sri Lanka Time Use Survey of 2017, an employed person in Sri Lanka on average spends 7.5 hours on SNA activities, 3 hours on non-SNA activities, and 13.5 hours on non-productive activities per day.
[8]Note that an upper threshold of 2 times the median time spent in SNA and non-SNA activities was also considered. However, the results of the study were not very sensitive to this alternative threshold.

Descriptive Analytical Approach

Once the threshold levels of time poverty and income poverty are established, cross tabulations have been performed to compare the distribution of time poverty among income poor and income non-poor people, in order to get an understanding on whether time poverty is more of an issue concerning people with relatively high levels of income or low levels of income in the context of Sri Lanka.

To examine different combinations/scenarios of time poverty and income poverty, on the basis of the time poverty and income poverty thresholds, the sample has been divided into four groups as: (1) being both time non-poor and income non-poor; (2) being time poor and income non-poor; (3) being time non-poor and income poor; (4) being both time poor and income poor. Figure 2 illustrates the classification of these four scenarios/groups, and out of these four groups, it will be examined which categories of people, based on some of their demographic and socio-economic characteristics, will fall into each of these four groups.

Figure 2: Time Poverty versus Income Poverty: A Typology



Source: Author's construction based on theory

Regression Specification

In order to analyse the impact of income poverty on time poverty, a binary logistic regression analysis will be conducted, where the dependent variable '*TimePoor*' is binary in nature and takes the value of "1" if a person is time poor, and "0" if otherwise. The model is specified as below:

$$\Pr(TimePoor = 1|X_i) = \beta_0 + \beta_1 IncomePoor + \beta_2 Sector + \beta_3 Age + \beta_4 Agesq + \beta_5 Gender + \beta_6 Ethnicity + \beta_7 MaritalStatus + \beta_8 HHsize + \beta_9 Children + \beta_{10} Elderly + \beta_{11} Education + \beta_{12} Industry + \beta_{13} Occupation + \beta_{14} EmpStatus + \varepsilon_i \quad (6)$$

where, X_i represents the explanatory variables and β_1 represents the association between time poverty and income poverty[9], conditional upon other control variables such as sector, age, square of age, gender, ethnicity, marital status, household size, number of children, number of elderlies, level of education, occupation, industry, and employment status, in accordance with existing literature. Note that the main variable of interest, '*IncomePoor*'[10], is also binary in nature where it takes the value of "1" if a person is income poor, and "0" if otherwise. Through the results obtained from this model, it is possible to identify whether the probability or likelihood of a person being time poor increases or decreases with the corresponding independent variable, when all the other factors affecting time poverty are held constant (*ceteris paribus).*

RESULTS AND DISCUSSION

Descriptive Analysis

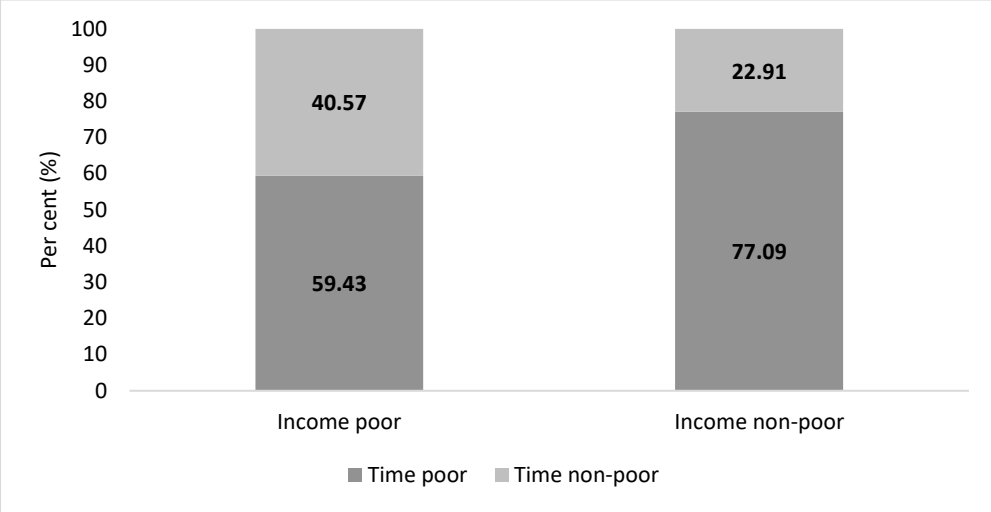
In order to examine the association between time poverty and income poverty, it is important to compare and understand which category of employed people, out of income poor and income non-poor people, are more time poor in Sri Lanka. Accordingly, figure 3 illustrates the distribution of time poverty among income poor and income non-poor people. As observable, when separately considering income poor and income non-poor people, a higher proportion of income non-poor people are time poor compared to income poor people. As such, around 77 per cent of income non-poor people are time poor compared to just 59 per cent of income poor people, thereby revealing how time poverty in Sri Lanka is more of an issue among income non-poor or high-income people. This relatively high proportion of income non-poor people being time poor can be rationalised by the fact that people tend to be income non-poor when they spend more time in paid work (labour market) to earn more income, which thereby makes them income non-poor but time poor. Correspondingly, most of such income non-poor people tend to be time

[9]Several studies, such as Orkoh et al. (2019), conducted in the context of other developing countries, have clearly identified the direction of causality to be from income poverty to time poverty. Hence, it could be concluded that β_1 most likely captures the impact of income poverty on time poverty.

[10]It is possible for the '*IncomePoor*' variable to be an endogenous variable in this model. Ideally, this could be addressed by employing an Instrumental Variable estimator. However, this study does not address the problem of endogeneity due to the lack of a suitable instrument found in the survey data. It is recommended that future studies capturing the impact of income poverty on time poverty address this limitation.

poor since they have avoided becoming income poor only at the cost of incurring time poverty. As such, this finding gives an indication of a possible negative association or trade-off between time poverty and income poverty in Sri Lanka, which will be examined extensively in the regression analysis.

Figure 3: Time Poverty among Income Poor and Income Non-Poor People

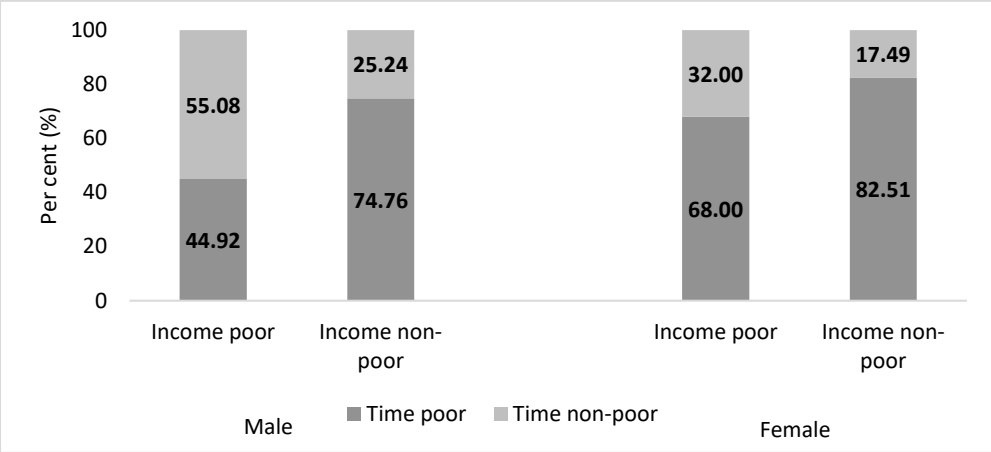


Source: Author's estimates using Time Use Survey (2017) and Labour Force Survey (2017)

A gender-wise comparison of the distribution of time poverty among income poor and income non-poor categories also reveal a larger proportion of both income non-poor males and females to be time poor compared to the corresponding income poor males and females. However, time poverty among income non-poor females is as high as 82 per cent compared to just 75 per cent of income non-poor males, as illustrated in figure 4. An important observation is that when considering the income poor category, there is a significant disparity in the distribution of time poverty across males and females since a significantly large proportion of income poor females (68 per cent) are also found to be time poor compared to the low proportion of income poor males (45 per cent) who are time poor. This gives an indication of the gendered nature of time poverty in Sri Lanka, where regardless of whether females are income poor or income non-poor, they are more susceptible to time poverty due to socio-cultural norms and traditional gender roles in South Asian countries which require women to perform majority of domestic/household activities such as cooking, taking care of children etc. Therefore, even if females were to spend less time in paid work, which causes them to be income poor, they are still more likely to be time poor due to the large amount of time they spend doing domestic activities, thus rationalising the high proportion (68 per cent) of income poor females who are time poor in Sri Lanka. Contrastingly, males who spend less time in paid work are very less likely to be time poor since they do not have to spend time doing domestic activities, thus rationalising the lower proportion (45 per cent) of income poor males who

are time poor in Sri Lanka. While employed women are considered to have a double burden of time due to paid work and household tasks as stated by Orkoh et al. (2019), the notion that being employed is better off for females is being questioned to some extent these days.

Figure 4: Time Poverty among Income Poor and Income Non-Poor People by Gender



Source: Author's estimates using Time Use Survey (2017) and Labour Force Survey (2017)

Table 1 provides the proportion of people that fall into each of the four scenarios/combinations of time poverty and income poverty. It is evident that the highest proportion of people, that is around 71 per cent, fall into the scenario of being time poor and income non-poor (scenario 2). This finding is consistent with the previous finding where it was revealed that a significantly large per centage of income non-poor people are time poor [11]. The fact that the largest proportion of employed people in Sri Lanka are income non-poor but time poor, reflects a situation where people with comparatively high levels of income have lack of time available and allocated for self-care, leisure, learning and socialising [12] which thereby makes them time poor. This situation of high income being associated with less time for self-care, leisure and related activities further highlights the possible trade-off between time and income, such that when income increases, time for self-care and leisure decreases and vice versa, thereby providing an indication of a possible negative association between time poverty and income poverty in Sri Lanka.

[11]Out of all income non-poor employed people in Sri Lanka, 77.09 percent are time poor (see figure 3).

[12]Note that self-care, leisure, learning, and socialising are the activities that comes under the non-productive category in the Sri Lanka Time Use Survey (TUS), which are considered in this study to make an individual time poor if he/she do not have adequate time available for those activities.

Table 1: Proportion of People in each of the Four Scenarios

		Income poverty	
		Non-poor (%)	**Poor (%)**
Time Poverty	**Non-poor (%)**	21.22	2.99
	Poor (%)	71.41	4.38

Source: Author's estimates using Time Use Survey (2017) and Labour Force Survey (2017)

The second largest proportion of employed people, around 21 per cent, fall into the most preferred scenario of being time non-poor as well as income non-poor (scenario 1). People who fall into this group are better off in terms of both time and income, hence it is important to investigate further into the characteristics of such people to get an understanding about the reasons as to why they are better off whereas another segment of people are worse-off.[13] As such, approximately 4 per cent of employed people in Sri Lanka are worse-off as they are both time poor as well as income poor (scenario 4). The group of people who fall into this scenario can be considered to be those who are income poor to the extent that despite the high amount of time they spend in paid work, which causes them to be time poor, they are still unable to break free from income poverty. On the other hand, it could also be those who are significantly constrained by time due to the large amount of domestic work (unpaid work) they do, possibly females, which makes them have limited time available to be spent on paid work, thus causing them to be income poor as well. Additionally, the smallest proportion of employed people fall into the scenario of being time non-poor but income poor (3 per cent).

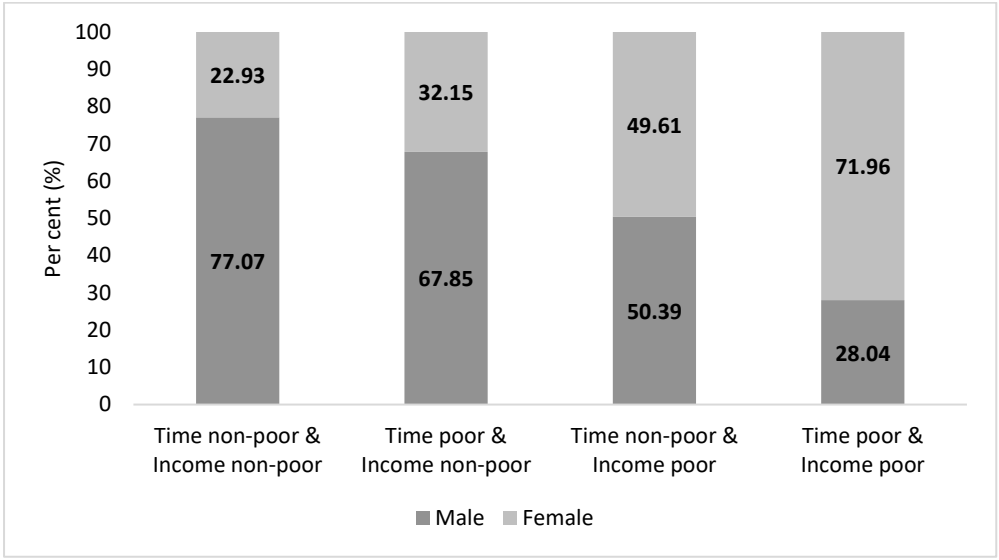
Figure 5 illustrates the gender composition of the four groups of people, and as observable, nearly 72 per cent of those who fall into the worst scenario of being both time poor and income poor are females compared to just 28 per cent of males. This finding that gender-wise females are the segment of people who are mostly worse-off in Sri Lanka in terms of simultaneously being both time poor and income poor can be justified through Orkoh et al. (2019) who asserts that the disproportionately large amount of household responsibilities that women in developing countries bear which makes them time poor, causes them to have limited time to engage in paid work or invest in capability enhancing activities (e.g. education, skill-training) that yield economic returns, thus making them income poor as well. Based on this notion, considering that Sri Lanka is still a developing country in the South Asian region, females being mostly subjected to simultaneously be both time poor and income poor compared to males is reasonable.

In contrast to the worst scenario of being both time poor and income poor, all the other three scenarios are mostly comprised of males such that more than half of each group of people in the three scenarios are males (see figure 5). Accordingly, nearly 77 per cent of the group of people who are simultaneously time non-poor and income non-poor (best

[13] The characteristics of people who fall into each scenario/group will be analysed subsequently.

scenario) are males, whereas only 23 per cent of this group are females. This indicates how males are better off since males are the majority (77 per cent) in the best scenario of being non-poor in both dimensions, and the minority (28 per cent) in the worst scenario of being poor in both dimensions. Males being better off can be justified through the fact that there exists a gender pay gap in the labour market of Sri Lanka where males receive comparatively higher hourly wages compared to females, along with the fact that males have very few household responsibilities compared to females, which makes them less susceptible to simultaneously be time poor as well as income poor. The opposite can be stated for females, that is, comparatively lower hourly wages and large amount of household responsibilities make females more susceptible to simultaneously be time poor as well as income poor, thus making them worse off.

Figure 5: Gender Composition of the Four Groups of People (Four Scenarios)

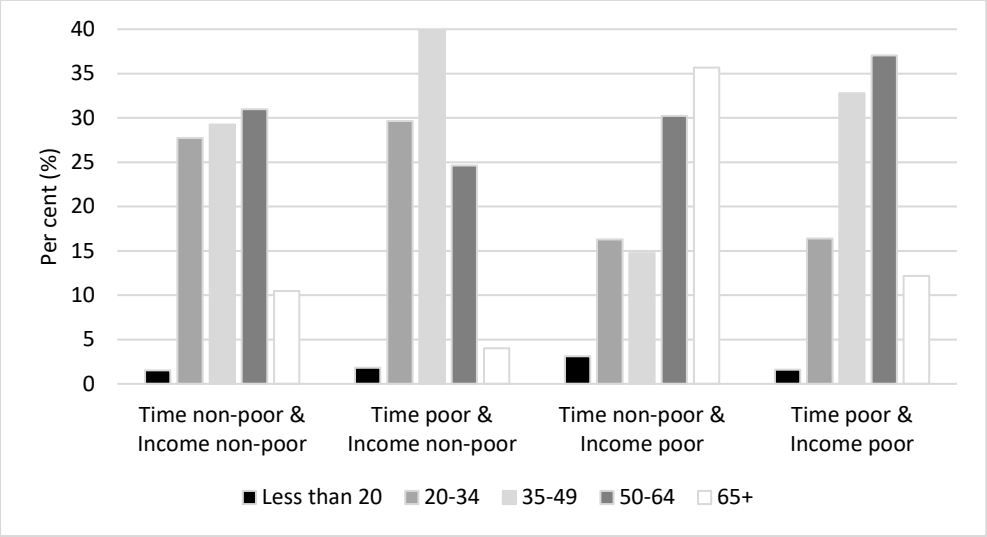


Source: Author's estimates using Time Use Survey (2017) and Labour Force Survey (2017)

Figure 6 depicts the age composition of the four groups of people (four scenarios). An important observation is that in both the best scenario (being time non-poor and income non-poor) and the worst scenario (being time poor and income poor), the highest proportion of people are from the 50-64 age category. Accordingly, 31 per cent of the group of people who are time non-poor as well as income non-poor, and 37 per cent of the group of people who are time poor as well as income poor are from the 50-64 age category. While people in the 50-64 age category are those with more work experience as it is the latter part of their careers, they generally tend to be income non-poor due to the high returns they receive for their high level of work experience. Moreover, they tend to be time non-poor since the amount of household responsibilities they have are at a minimum mainly due to the fact that their children are most likely to have reached adulthood which allows them to share the burden of household responsibilities with their

children, thus enabling such 50-64 aged people to devote more time on self-care and leisure and to be time non-poor. Hence it is justifiable that most of the people who are better off (simultaneously time and income non-poor) are in the 50-64 age category.

Figure 6: Age Composition of the Four Groups of People (Four Scenarios)



Source: Author's estimates using Time Use Survey (2017) and Labour Force Survey (2017)

On the other hand, the finding that most of the people who are worse off (simultaneously time and income poor) are also from the 50-64 age category can be rationalised through Ferranna et al. (2022)[14] which showed how people cut back on paid work as they grow older and reach old age, and how their wages tend to decrease which could cause them to be income poor. However, despite the reduction in paid work, Ferranna et al. (2022) also asserted that "as people grow old, part of the time devoted to paid work is reallocated to unpaid work" which include household duties that could cause such people to also be time poor in addition to being income poor. Considering that the gender gap in household responsibilities persist in Sri Lanka even during old age, it is arguable that most 50-64 aged people in the worst scenario (being simultaneously time and income poor) are females. More importantly, the previous finding that the group of people in the worst scenario mostly comprise of females[15] together with the finding that the group mostly comprise of people in the 50-64 age category further highlights how women in the age category 50-64 are most likely to be the ones who simultaneously suffer from both time poverty and income poverty, and hence worse off in Sri Lanka. Furthermore, the previous finding that the group of people in the best scenario mostly comprise of males along with

[14]Ferranna et al. (2022) analyses the patterns of time use among older people in developed and developing countries. While the study has incorporated India, the time use patterns of old age people in this study are applicable to Sri Lanka to a certain extent.

[15]Refer back to figure 5 which illustrates the gender composition of the four groups of people.

the finding that the group mostly consists of people in the 50-64 age category, provides an indication of how men in the 50-64 age category are most likely to be better off in terms of simultaneously being time and income non-poor in Sri Lanka. It is also noteworthy that the second highest proportion of people in both best and worst scenarios are people in the 35-49 age category. Hence in a more general sense it could be concluded that middle aged (35-64 age category) women are worse off, while middle aged men are better off.

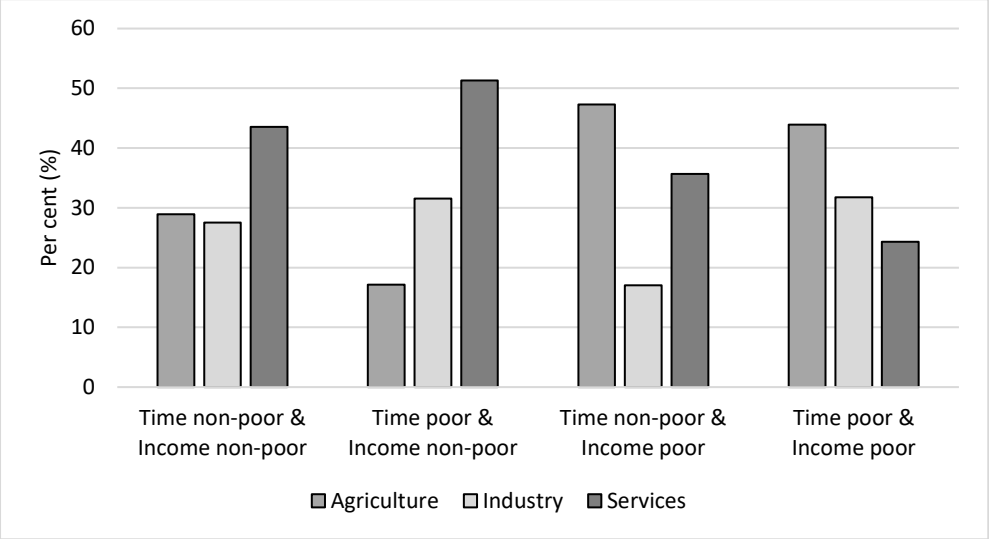
With respect to the group of people who are time poor but income non-poor, it is observable from figure 6, that the highest proportion (39.9 per cent) of the group consists of people in the 34-49 age category. While young or middle-aged people generally have small children and elderly parents that need taking care of in addition to other household duties and paid work, people in 34-49 age category generally tend to be time poor due to the competing responsibilities they have. Moreover, since people in this age category tend to maintain a stock of savings for future use along with the high expenses they have, they allocate a significant proportion of their time on paid work thus being income non-poor. With competing requirements on their time, with paid work and unpaid work, people in this age category are considered to be the most hard-working group of people who spend the least time on leisure and self-care (Ferranna et al., 2022), thus being time poor but income non-poor.

Out of the group of people who are time non-poor but income poor, the highest per centage (35.7 per cent) of people are aged 65 and above (see figure 6). While 65 is the general retirement age in Sri Lanka, some people continue to engage in paid work even though they are eligible for retirement. However, despite their continuation of work they tend to cut back on paid work and devote more time on leisure and self-care due to retirement incentives and declining health. Moreover, the fact that people in this age group mostly have middle aged children who are likely to perform majority of the household duties, they generally tend to be time non-poor. As a result of the substitution of paid work with leisure and self-care, along with the very less amount of household duties, employed people above age 65 are highly likely to be time non-poor but income poor as evident from figure 6.

Figure 7 illustrates the composition of the four scenarios or groups of people based on industry of employment. When considering the two groups of people who are income non-poor, that is, the group which is both time non-poor and income non-poor, and the group which is income non-poor but time poor, it is evident that the highest proportion of people in these two groups work in the services sector (see figure 7). Accordingly, 43.6 per cent of the people who are simultaneously time non-poor and income non-poor, and 51.3 per cent of the people who are income non-poor but time poor are in the services sector, while the remainder in each group are from agriculture and industrial sectors. This finding is consistent because the services sector generates stable and high income

compared to the other two sectors, thus making people working in the services sector to generally be income non-poor compared to those who work in agriculture and industrial sectors. With respect to time poverty, these people in the services sector could either be time poor or time non-poor depending on the nature of their work and other socio-economic and demographic factors.

Figure 7: Composition of the Four Groups of People by Industry



Source: Author's estimates using Time Use Survey (2017) and Labour Force Survey (2017)

Contrastingly, in relation to the two groups of people who are income poor, that is, the group which is both time poor and income poor, and the group which is time non-poor but income poor, it is evident that the highest proportion of people in these two groups work in the agriculture sector as observable from figure 7. Accordingly, 44 per cent of those who are simultaneously income poor and time poor, and 47 per cent of those who are income poor but time non-poor work in the agriculture sector. While the agriculture sector tends to generate relatively low and unstable income, it is justifiable for people working in agriculture sector to be relatively income poor compared to those who work in the other two sectors, irrespective of whether they are time poor or time non-poor. Importantly, the revelation that the services sector accounts for the highest proportion (43.6 per cent) of people in the best scenario (simultaneously being time non-poor and income non-poor) and the lowest proportion (24.3 per cent) of people in the worst scenario (simultaneously being time poor and income poor) further highlights how people working in the services sector are better off in relation to time poverty and income poverty in the context of Sri Lanka.

Regression Analysis

As the descriptive analysis indicated signals of a possible negative association between time poverty and income poverty in Sri Lanka, this section goes one step further and

attempts to examine the association between time poverty and income poverty, conditional upon other control variables, through the binary logistic regression technique. Table 2 provides the logistic regression output. Accordingly, model 1 and model 2 includes the income poverty variable along with several other individual and household level demographic and socio-economic factors, and model 3 which is the final model, incorporates several labour market characteristics in addition to demographic and socio-economic factors. The model improvement is evident through the increase in the likelihood ratio when moving from model 1 to model 3 with the inclusion of relevant variables.

As evident, the final results from model 3 reveal a significantly negative association between time poverty and income poverty in Sri Lanka, such that at the 1 per cent level of significance, an employed person who is income poor is less likely to be time poor compared to an employed person who is income non-poor, when all the other factors affecting time poverty are held constant (*ceteris paribus*). This finding is consistent with that of the descriptive analysis which revealed a significant proportion, around 77 per cent, of income non-poor people to be time poor, compared to a much lower proportion, around 59 per cent of income poor people who are time poor, thereby indicating how time poverty is an issue mainly among income non-poor or high-income people in Sri Lanka.

This negative association between time poverty and income poverty in Sri Lanka, on one hand reflects how people who are income poor are less likely to be time poor because they spend only a small amount of their time in paid work, which is the reason why they are income poor but have adequate time for leisure and self-care, hence being time non-poor. On the other hand, it also reflects how income non-poor individuals who engage in paid work to earn a wage or salary to reach the minimum income poverty threshold, are not in a position to cut back on the time they allocate for either paid work or household work, thereby causing them to have very limited time available for self-care and leisure, making them more likely to be time poor. Hence, such people have avoided becoming income poor (that is, they are income non-poor) only by incurring time poverty. This is in line with Burchardt (2008) who asserts that some people are significantly constrained by both time and income, such that they are able to escape income poverty only by sacrificing the time they spend on leisure and self-care, thus falling into time poverty.

Additionally, even though such people are income non-poor, they do not have the means to purchase time-saving devices nor hire the services of other people such as domestic servants, caretakers etc. to carry out their household duties and reduce their burden on time. Accordingly, such people face a severe trade-off between time poverty and income poverty. It can be concluded from this regression result that the situation of Sri Lanka conforms to the existence of a negative association or trade-off between time poverty and income poverty. Findings similar to this have been found in Ghana (Orkoh et al., 2019), and the United Kingdom (Burchardt, 2008).

Table 2: Logistic Regression of Time Poverty

Dependent variable (Time poor = 1 if time poor, 0 otherwise)	Model 1	Model 2	Model 3
Constant	-0.078	0.374	-0.295
	(0.335)	(0.420)	(0.440)
Income poor	-0.698***	-0.754***	-0.571***
	(0.133)	(0.135)	(0.138)
Sector (Ref: Urban)			
Rural	-0.098	-0.143	-0.054
	(0.094)	(0.096)	(0.098)
Estate	0.089	0.015	0.138
	(0.187)	(0.193)	(0.204)
Female	0.388***	0.418***	0.392***
	(0.085)	(0.090)	(0.092)
Age	0.095***	0.042**	0.046***
	(0.015)	(0.018)	(0.018)
Age-squared	-0.001***	-0.0008***	-
	(0.0002)	(0.0002)	0.0008***
			(0.0002)
Ethnicity (Ref: Sinhala)			
Tamil	-0.434***	-0.395***	-0.339***
	(0.089)	(0.092)	(0.093)
Moor	-0.873***	-0.916***	-0.936***
	(0.127)	(0.131)	(0.132)
Other	-1.593***	-1.742***	-1.845***
	(0.497)	(0.506)	(0.509)
Marital status (Ref: Unmarried)			
Married	-	0.629***	0.648***
		(0.127)	(0.127)
Divorced/Widowed	-	0.639***	0.625***
		(0.198)	(0.199)
Household size	-	-0.051*	-0.059**
		(0.029)	(0.029)
Children < 15 years	-	0.178*	0.184*
		(0.095)	(0.096)
Elderly > 75 years	-	0.241*	0.232*
		(0.123)	(0.125)
Education (Ref: Tertiary)			
Primary or below	-	0.395**	0.558***
		(0.187)	(0.209)
Secondary	-	0.508***	0.631***
		(0.167)	(0.190)
Collegiate	-	0.549***	0.604***
		(0.167)	(0.178)
Occupation (Ref: Professionals and Technicians)			
Managers, senior officials, and legislators	-	-	0.352**
			(0.180)
Clerks, services and sales workers	-	-	0.387**
			(0.163)
Skilled agricultural, craft workers, and machine operators	-	-	0.111
			(0.137)
Elementary occupations	-	-	0.088
			(0.147)
Industry (Ref: Agriculture)			
Industry	-	-	0.374***
			(0.110)
Services	-	-	0.432***
			(0.112)
Employment status (Ref: Employee)			
Employer	-	-	-0.263
			(0.242)
Own account workers	-	-	-0.393***
			(0.098)
Observations (N)	4316	4316	4316
Likelihood ratio chi^2	258.98	304.05	362.30
Prob > chi^2	0.000	0.000	0.000

Note: Standard errors in parenthesis; *, **, and *** indicates the estimated coefficients are statistically significant at 10 per cent, 5 per cent, and 1 per cent level of significance respectively.

Source: Author's estimates using Time Use Survey (2017) and Labour Force Survey (2017)

Apart from income poverty, which is the main variable of interest, there are other control variables which also have significant impact on time poverty. One such important variable is gender, and the results, as observable in table 2, reveal that an employed female is more likely to be time poor compared to an employed male. This finding is consistent and as expected since in South Asian countries such as Sri Lanka, females are expected to perform majority of the household work regardless of whether they are employed, due to the prevailing socio-cultural norms. Similar findings are observable in other developing countries such as Ghana (Orkoh et al., 2019), Guinea (Bardasi and Wodon, 2006) and Pakistan (Saqib and Arif, 2012), where females are revealed to be more susceptible to time poverty.

As the priorities of people, their time use patterns, and their allocation of time among paid work in the labour market, unpaid work in the domestic sphere, and self-care/leisure activities generally differ based on their age, another significantly important correlate of time poverty is age. As such, the results indicate that as age of an employed person increases, the likelihood of that person being time poor increases. However, it is evident that time poverty has a non-linear relationship with age, and the significantly negative coefficient on age squared indicates how as people get older, the positive effect of age on time poverty is lessened. This is valid because after a certain age, people tend to reduce the time they spend in both paid work (labour market) and unpaid work (domestic activities) and allocate more time for self-care and leisure, hence becoming time non-poor. Specifically, as they reach old age, they may share some of the workload in relation to household duties with their children or hire the services of outsiders if they have sufficient levels of income.

When considering ethnicity, the regression results reveal that employed people from Tamil, Moor and other minority ethnic groups are less likely to be time poor compared to employed people who are Sinhalese. This is an interesting observation as it provides an indication of a possible difference in the cultures, sociocultural norms and practices of these different ethnicities, which makes people in minority ethnic groups to be less prone to time poverty compared to Sinhalese. One rationale could be that minority ethnic groups share the burden of household responsibilities with each other compared to Sinhalese people. However, in depth study of this revelation in future research may be useful in order to come to a firm conclusion.

Since the extent of responsibilities an individual has and the time spent on each responsibility is highly dependent upon whether or not an individual is married, marital Status is another important determinant of time poverty observable in prevailing literature related to other developing countries (Bardasi and Wodon, 2006; Orkoh et al., 2019; Saqib and Arif, 2012; Vega-Rapun et al., 2020). Similarly, in the context of Sri Lanka as well, marital status is found to have a significant effect on time poverty. Accordingly, the positive and significant coefficients on both married and divorced/widowed categories in

table 2 reveals that both married people and divorced/widowed people are more likely to be time poor compared to unmarried people. This finding is justifiable since unmarried people have less responsibilities both in terms of household duties as well as earning income due to the fact that they generally do not have many people (family members) depending on them unlike married people who have their spouse and/or children relying on them and divorced people who may have children relying on them, both financially and domestically, which makes them more likely to be time poor.

Taking into consideration how household duties and responsibilities are generally distributed amongst family members in a household, it is expected for individuals to have different levels of time poverty depending on the number of members in a household and the manner in which duties are shared amongst each other. Accordingly, household size is revealed to have a significantly negative effect on an employed person being time poor in Sri Lanka, as observable from table 2. That is, as the number of members in a household increase, the likelihood or probability of an employed person being time poor decreases. According to Orkoh et al. (2019), the direction of the impact of household size on time poverty depends on the gender composition as well as the age composition of the household. Based on this notion, employed people who are in households with fewer children and elderlies but more adults (preferably female adults), are less likely to be time poor. Therefore, this negative effect of household size on time poverty in Sri Lanka provides an indication of how most of the households of employed people in Sri Lanka are composed of more adults compared to children and elderly people. Consistent with this, employed people in households with one or more child younger than 15 years, are more likely to be time poor than employed people in households with no children, as revealed in table 2. Similarly, as the number of elderly people older than 75 years in a household increase, the likelihood of an employed person being time poor increases. While children and elderly people are dependents, they require more attention and care in addition to the financial support they require, which makes an employed person who is responsible for them to be time poor due to the double burden of time (unpaid work and paid work) they have.

Level of education is another important and significant correlate of time poverty found in empirical literature related to other countries (Bardasi and Wodon, 2006; Orkoh et al., 2019; Saqib and Arif, 2012; Vega-Rapun et al., 2020). Consistently, for Sri Lanka, the results show the level of education to have a significant impact on time poverty of employed people. Accordingly, employed people who either have a primary or below education, a secondary education, or a collegiate education are more likely to be time poor compared to those with tertiary education. This finding reflects how low educational attainment increases the probability of an employed person being time poor and correspondingly, how high educational attainment reduces the probability of an employed person being time poor in Sri Lanka. This finding is reasonable because high educational attainment implies high skills, which enables such people to earn more by spending

relatively less time in paid work compared to low skilled people who have to spend more time and effort to earn more, which makes low skilled people to be more susceptible to time poverty. In addition to the less amount of time high skilled people are required to spend in paid work, they are also able to hire the services of other people to carry out their household tasks which further reduces the probability of them being time poor.

Considering how there is demand for people in certain occupation categories to work even at the household and/or community level, time poverty is also expected to differ depending on different occupation categories. In relation to occupations [16] of employed people in Sri Lanka, only two occupation categories are revealed to have a significant impact on time poverty as evident from table 2. As such, the results show that managers, senior officials, and legislators are more likely to be time poor compared to professionals, technicians, and associate professional. Similarly, clerks, services and sales workers are also more likely to be time poor compared to professionals, technicians, and associate professionals. While clerks, services and sales workers tend to be relatively less skilled and work under the authority of others, it is acceptable that they are more prone to time poverty than professionals.

Industry is another labour market characteristic which is found to have a significant association with time poverty. Correspondingly, people working in industry and services sectors are more likely to be time poor compared to those working in the agriculture sector. This finding can be rationalised through the fact that more than half of all employed people in the agriculture sector of Sri Lanka are own account workers[17] which gives them more flexibility in relation to their working hours, thereby making them less susceptible to time poverty compared to those in industry and services sectors where majority are employees who have inflexible working hours, thus being more susceptible to time poverty as evident through the results. In line with this finding, in relation to employment status, it is revealed that own account workers are significantly less likely to be time poor compared to employees. The relative flexibility of the workload and working hours of own account workers can be considered to be the main reason for their lower time poverty.

[16]The International Standard Classification of Occupation (ISCO-88) divides occupations in to nine major groups. This study has further categorised the nine groups in to 5 broad categories as:1) managers, senior officials, and legislators; 2) professionals/technicians and associate professionals; 3) clerks and clerical support workers/services and sales workers; 4) skilled agricultural, forestry and fishery workers/craft and related trade workers/plant, machine operators & assemblers; 5) elementary occupations.

[17]Approximately 53 percent of employed people in the agriculture sector are own account workers compared to much lower percentages of own account workers in industry (23 percent) and services (28 percent) sectors.

CONCLUSIONS

The empirical study of time poverty is a recent phenomenon in Sri Lanka with the emergence of time-use data in 2017. While there is very limited research in relation to time poverty, no research exists in relation to the association between time poverty and income poverty in the context of Sri Lanka, despite the growing interest in the area due to the wide-ranging implications. Therefore, considering the importance of both time and income in determining the wellbeing of people, this study examined the association between time poverty and income poverty in Sri Lanka.

In achieving this objective, both a descriptive analysis as well as a regression analysis were conducted. Through the descriptive analysis, firstly, a comparison of time poverty among income poor and income non-poor people revealed time poverty to be an issue mainly concerning income non-poor people than income poor people, where a significantly large proportion of income non-poor people in Sri Lanka are time poor compared to income poor people, indicating how time poverty is mostly suffered by people with relatively high levels of income. Secondly, a gender-wise comparison revealed a higher proportion of income non-poor females to be time poor compared to income non-poor males. More importantly, it was also revealed that a significantly large proportion of income poor females are also time poor, reflecting how time poverty is a major concern among females regardless of whether they are income poor or income non-poor, owing to the sociocultural norms in Sri Lanka which expect women to perform majority of domestic work regardless of their employment status.

While four scenarios or groups exist with respect to different combinations of time poverty and income poverty, an employed person may either be time non-poor as well as income non-poor, time poor but income non-poor, time non-poor but income poor, or time poor as well as income poor. As such, thirdly, this study found that in Sri Lanka the highest proportion of employed people fall into the scenario of being time poor and income non-poor, followed by those who are both time non-poor and income non-poor, and those who are both time poor and income poor. Further investigation of these four groups of people revealed that the group of people who fall into the best scenario of being time non-poor as well as income non-poor comprise mostly of males in their middle age who are employed in the services sector. On the other hand, the group of people who fall into the worst scenario of being time poor as well as income poor, was found to be mostly females in their middle age who are employed in the agriculture sector. As such, this finding provides insights on the plight of employed women in Sri Lanka, in relation to both time poverty as well as income poverty.

Finally, the logistic regression results revealed a significantly negative association between time poverty and income poverty, indicating a trade-off between the two dimensions of poverty. Accordingly, in the context of Sri Lanka, an employed person who is income poor is less likely to be time poor than an employed person who is income

non-poor. Furthermore, in addition to income poverty, several other factors that were found to have significant effects on the likelihood of an employed person being time poor are gender (being female), age, ethnicity, marital status, household size, presence of children or elderly in household, level of education, occupation, industry, and employment status.

Even though escaping income poverty is important in order to achieve material prosperity, the revelation in this study that most employed people in Sri Lanka escape income poverty only at the cost of incurring time poverty by sacrificing their self-care and leisure, as implied through the trade-off between the two dimensions of poverty, provides sufficient grounds to question the benefits of escaping income poverty. Hence, based on the study findings and considering the wide-ranging implications of time poverty, which includes adversely affecting one's physical and mental wellbeing in addition to hindering one's ability to improve skills and productivity through education and training due to time constraints, several policy implications can be derived.

As such, the implementation of labour market policies or labour laws that promote flexible working conditions, along with appropriate and healthy working hours could address the trade-off between time poverty and income poverty. Specifically, in relation to income non-poor people, the strict enforcement of a ceiling on working hours including overtime work, regardless of the type of institution, would be beneficial. Additionally, special attention should be directed towards the segment of employed people who are both time poor and income poor. While females compose majority of the mentioned-group, benefit schemes especially for single mothers, as well as encouraging employers to facilitate onsite day-care services for female employees would be possible solutions. Moreover, specific attention should also be directed towards females employed in the agriculture sector, possibly through the implementation of minimum wage laws and flexible working conditions/working hours for these women as they too comprise majority of the group of people who are both time poor and income poor. Additionally, measures should be taken to promote awareness about the negative implications of the unequal distribution of household responsibilities between men and women, where women's employability is hindered due to the time constraints they face in improving their capabilities and skills, in addition to the health implications they face by overworking.

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