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Decomposing the urban-rural welfare gap in Sri Lanka

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Abstract

This paper explores the urban-rural welfare gap in 2002 and 2009/10 for the case of Sri Lanka. This was a period of high growth and falling poverty rates in the country. The paper attempts to explore three issues: (a) what are the determinants of urban and rural household welfare, (b) does the urban-rural welfare gap rise or fall between 2002 and 2009/10, and (c) what factors contribute towards the widening or narrowing of the urban-rural welfare gap over time. The paper contributes to existing literature using a new method of unconditional quantile regression to examine the determinants of per capita expenditure for urban and rural households across the expenditure distribution. Further, this method enables us to isolate and identify the characteristics that contribute towards the urban-rural divide in welfare. For this, a variant of the threefold Blinder-Oaxaca decomposition is applied directly to the estimation results of the unconditional quantile regression. We find the urban-rural welfare gap to have fallen considerably between 2002 and 2009/10. At a given point in time, the welfare gap is larger between richer urban and rural households relative to poorer households.

JEL Classification: C31, O12, R11

Keywords: unconditional quantile regression, urban-rural welfare gap, Blinder-Oaxaca decomposition, Sri Lanka

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1. Introduction

This paper explores the urban-rural welfare gap in Sri Lanka between 2002 and 2009/10, a period of high growth and falling poverty rates. It aims to answer three questions – (1) what are the determinants of urban/rural household welfare, (2) how has the urban-rural welfare gap changed over time, and (3) what factors contribute towards the widening or narrowing of the gap. Welfare is measured using household expenditure per capita. In order to explore urban-rural welfare differences across rich and poor households, we examine the entire expenditure distribution.

The literature views economic policy as being subject to an "urban bias". Knight and Song (1999) define the urban bias as the government being more concerned about urban development rather than rural development due to the political power of urban dwellers. Lipton (1977) who popularized this concept noted that spatial differences in poverty across urban and rural areas will slow down the growth process in developing countries. Sri Lanka has experienced high economic growth, falling poverty rates and is transitioning from being an agricultural- to a service-oriented economy over the last decade. The poverty headcount ratio[1] fell rapidly from 22.7 per cent to 8.9 per cent between 2002 and 2010, primarily due to the sharp fall in rural poverty (Department of Census and Statistics).

In early 2009, Sri Lanka saw the end of a 30-year war that had restricted development of the Northern and Eastern provinces. The country began to prioritize rural development and new infrastructure projects commenced across all areas (World Bank, 2009). In developing countries, the urban-rural welfare gap is considered a vital element of inequality (Nguyen et al, 2007; Lahiri, 2013; Thu Le and Booth, 2014). Understanding the magnitude of the welfare gap as measured by household expenditure per capita and identifying the key factors contributing to this gap is the goal of this paper.

The paper contributes to the existing literature in two ways. First, the urban-rural welfare gap has not been formally decomposed for the case of Sri Lanka[2]. This paper uses data from the 2002 and 2009/10 Household Income and Expenditure Surveys covering the significant period of Sri Lanka's growth and transition. The second contribution is through the use of a new method of unconditional quantile regression (Firpo et al., 2009) applied to examine the determinants of per capita expenditure for urban and rural households across the expenditure distribution. Using this method enables an isolation of the factors that contribute to the urban-

1 The poverty headcount ratio was measured at the national poverty line of 1,423 rupees (LKR) in 2002, and 3,028 rupees in 2010 (base year is 2002). The poverty headcount ratio at $1.90 a day (2011 PPP) was 8.25 per cent in 2002 falling to 2.41 per cent in 2010. The Northern and Eastern districts have not been included due to availability of limited data prior to 2009/2010

2 This was revealed from a literature search in EconLit

rural expenditure gap across the expenditure distribution. To do this, the Blinder-Oaxaca decomposition is applied directly to the estimation results from the unconditional quantile regression. The benefit of this method is that it does not require the estimation of several simulations; which are necessary with the alternative method of conditional quantile decomposition. The estimation of the Blinder-Oaxaca decomposition allows us to answer two of the fundamental questions in this paper – (1) how does the welfare gap vary across the expenditure distribution, and over time, and (2) what factors contribute towards this gap. The Blinder-Oaxaca decomposition isolates the urban-rural differences in characteristics/endowments (for example, differences in education levels across the two groups) from the urban-rural differences in returns to such characteristics (differences in the returns to education across urban and rural areas).

The findings obtained in this paper suggest that individual characteristics such as education, employment in the services sector, the presence of children in the household and receiving remittance income have a positive association with per capita household expenditure, whereas household size and employment in the agriculture sector have a negative association with per capita expenditure. This is true for households in both urban and rural areas.

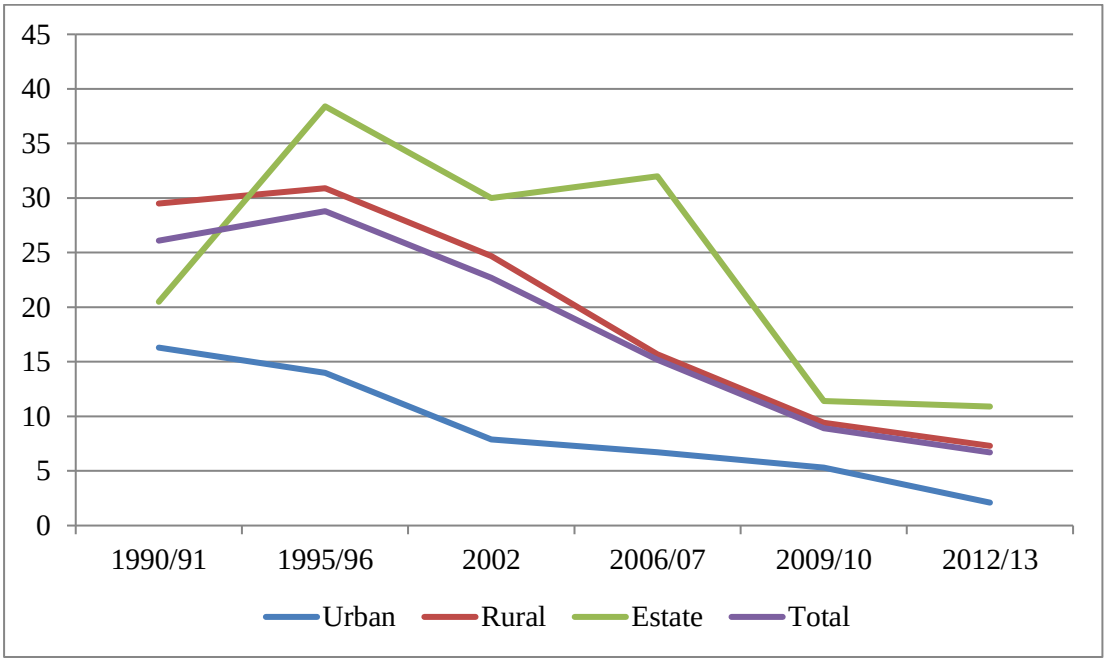
We then estimate the urban-rural welfare gap. At a given point in time, the gap increases from the bottom to the top of the expenditure distribution indicating that the differences in per capita expenditure between urban and rural households are greater for richer households. A number of factors contribute to the urban-rural welfare gap, including urban-rural differences in the levels of education, regions, industrial structure, and the relevant returns from these factors. Between 2002 and 2009/10, the urban-rural welfare gap reduced greatly; this was primarily due to lower urban-rural differences in returns to education, ethnicity and other individual characteristics. Overall, an adjustment of the total endowments/characteristics of rural households to those of urban households reduces the urban-rural expenditure gap by approximately 43 per cent in 2002 and 50 per cent in 2009/10 (at the median).

The rest of the paper is organized as follows. Section 2 summarizes the recent growth and development in Sri Lanka. Section 3 reviews some of the literature related to the urban-rural gap. Section 4 examines the data and variables that will be used in this study, followed by Sections 5 and 6 which employ the unconditional quantile regression technique introduced by Firpo et al. (2009) and apply the regression results to the Blinder-Oaxaca decomposition. Section 7 concludes along with policy implications and scope for future research.

2. Background of the economy

The Sri Lankan economy has undergone several changes in recent years. The aim of this section is to identify why an analysis of the urban-rural welfare gap during a period of development is worth examining. We explore the changes in poverty rates, urban/rural living conditions, regional differences and the changes in the industrial structure between 2002 and 2009/10. By doing so, we are able to identify some of the important changes that took place in this economy over time. In Sri Lanka, poverty as measured by the headcount ratio has dropped over time. The substantial fall in rural sector poverty is the leading contributor (82 per cent) to the drop in poverty at the national level between 2002 and 2009/10. Figure 1 shows the changes in poverty over time for each of the three sectors. Between 2002 and 2009/10, the rural poverty headcount ratio fell dramatically from 24.7 to 9.4 per cent, urban poverty headcount ratio fell from 7.9 to 5.3 per cent and estate poverty fell from 30 to 11.4 per cent.

Figure 1: Poverty Headcount Ratio (percentage)



Source: Department of Census and Statistics (author's computation)

The decrease in poverty has been linked to the rural development and infrastructure improvements across the country. Sri Lanka has had several projects targeted at the improvement in access to basic facilities for rural households. The Rural Hydro Electricity and water projects are some of the major projects; for example, the rural water project aided over 400,000 rural households in obtaining access to clean drinking water. Since the Tsunami affected many coastal areas in 2004, several development projects were undertaken to transform rural areas. Another project, the Samurdhi program, was established to encourage

participation of the poor, expanding opportunities for self- and wage employment at rural levels.

Statistics from the Censuses of Population and Housing for 2001 and 2011 show vast improvements in the access to various facilities such as clean water, electricity and the major sources of cooking fuel. While this is especially true for rural and estate areas, it is also the case that urban areas saw improvements. In 2001, 85.3 per cent of urban households had electricity as the main source of lighting and this rose to 96 per cent in 2011. In the rural sector, 62 per cent of households had electricity as the major source of lighting in 2001. By 2011, 85 per cent of the rural households had electricity. The main source of drinking water used by urban households is piped-born water (77.8 per cent of the households in 2001 and remained quite stagnant even in 2011). For the rural sector, the main source of drinking water comes from wells; in 2001, 58 per cent of rural households drank from protected wells and 11.5 per cent drank from unprotected wells. By 2011, the corresponding figures were 54 per cent and 4.8 per cent. In the urban sector, households use gas as the main source of cooking fuel and this rose from 45.3 per cent to 53.7 per cent of the population using it between 2001 and 2011. For rural and estate households, the main source is firewood, but more households report using gas as the main form of fuel in 2011. As the gap in terms of access to major household facilities has narrowed in recent years, we observe in our analysis that the urban-rural welfare gap has also narrowed over time.

In the past few years, road and air transportation recorded significant growth. The development in the transportation sector (particularly covering rural areas) was largely seen in the road development, with the expansion of transport services (both, rail and road). Improvements were made in the road network to ease passenger and goods transportation. A programme to revitalize roads in rural areas that commenced in 2004 was able to rehabilitate over 840 kilometres of roads (Central Bank of Sri Lanka, 2012). This focus on rural infrastructure development became a priority after the Tsunami which damaged significant areas of the rural transport sector. This enabled easy movement for individuals between towns and villages.

The country however has seen persistent differences across regions; the Central, Sabaragamuwa and Uva provinces (that include a large proportion of plantations) in particular, still have high levels of poverty. UNDP (2012) argues focus on making improvements at the regional level is required to prevent inequality from limiting the development of the economy. Regional differences also explain the significant variances in urban growth rates, and the diverse levels of urbanization among districts. Table A2 (refer to Appendix 2) presents the urban population by district. Uduporuwa (2010) showed that the Western province is the core urbanized region with the higher number of urban centres and highest percentage of urbanization. Other provinces however have not achieved significant urban

growth. Additionally, the country having recently seen the end of a 30-year war meant that development in the Northern and Eastern provinces was limited for a long period of time and skilled labour migrated to urban areas in the Western and Central provinces for better employment opportunities. This variation in levels of urbanization across districts and provinces motivates the inclusion of district-level variables in the analysis.

Having discussed the development of rural areas and regional differences that persist in Sri Lanka, we now turn to the changes in the industry structure that have taken place in the period under investigation. As we will observe, several changes occurred in terms of sectoral contribution to GDP and GDP growth, strengthening the argument for examining welfare changes over time. Table 1 gives the sectoral contribution to GDP and the growth rate in each sector (agriculture, industry and services) during the period of analysis. The contribution of agriculture to real GDP has fallen over time, remained fairly stagnant for industry and risen for services. The growth rate in GDP for each sector between 2002 and 2010 suggests that agriculture has the lowest growth rate of 3.8 per cent, whereas industry and services have the highest (6.3 and 6.4 per cent, respectively). This establishes the fact that not only do services contribute largely to GDP at a given point in time (over 59 per cent), but the growth in services contributes to overall growth of the economy. The last column measures the sectoral share of growth between 2002 and 2009/10. Services had the largest contribution towards GDP growth (62 per cent), followed by industry (30 per cent) and agriculture (8 per cent).

Table 1: Sectoral contribution to real GDP

	2002		2010		Growth between 2002 and 2010 %*	Share of growth by sector %*
	% share of GDP	2002/01 growth %	% share of GDP	2009/10 growth %		
Agriculture and Fishing	14.3	2.0	11.9	7.0	3.8	8
Industry	28.0	3.6	28.7	8.4	6.3	30
Services	57.7	4.8	59.3	8.0	6.4	62
Total	100	4.0	100	8.0	6.0	100

* Compiled by Author

GDP growth between 2002 and 2010 in each sector is measured as $\frac{ln(y_{2010})-ln(y_{2002})}{8}$ where "y" is the real GDP

The share of GDP growth by sector is measured as: $\frac{change\ in\ real\ GDP\ (by\ sector)\ between\ 2002\ and\ 2010}{change\ in\ real\ GDP\ between\ 2002\ and\ 2010}$

Population growth over the period 2002 to 2010 is 1 per cent per annum

Source: Department of Census and Statistics (DCS) National Accounts

Despite the strategies that were implemented to boost economic growth and reduce poverty to a large extent, persisting differences were observed across regions and socio-economic groups of the population. The Western province (including Colombo) has better access to markets, improved infrastructure, a

greater proportion of educated people, and is dominated by non-agricultural sectors compared to other provinces. The above findings suggest that the country has gone through several changes in recent years. This gives rise to the key issue to be examined in this paper – analysing welfare differences across urban and rural areas, and how this has changed over time.

3. Literature review

3.1 Theory and findings for other countries

This paper tries to answer the central question of what factors contribute to the urban-rural welfare gap in Sri Lanka. The motivation for doing so is both theoretical and methodological.

Theoretically, over the years, two main frameworks have been central to the study of the urban-rural divide: the view that economic policy is subject to an "urban bias", and the Lewis model of surplus rural labour. The concept of an urban bias was popularized by Lipton (1977) who noted that spatial differences in poverty between urban and rural areas slows down the development process in poor countries. Subsequently, the urban-rural gap in welfare and income has been of concern in development research. The theory of an urban bias stems from the notion that the government favours urban areas over rural areas because of the political power of urban dwellers (Knight and Song, 1999). Despite the urban dwellers being a small proportion of the total population in developing countries, their influence on government policy is argued to be disproportionate to their numbers. If the government permits a wage differential favouring urban employment, rural-urban migration will be in excess of the capacity of urban areas which in turn gives rise to urban unemployment.

The two-sector model by Lewis (1954) was originally based on the argument that developing countries have a surplus of unproductive labour in agriculture primarily in rural areas which can be shifted to the growing manufacturing sector in urban areas to promote industrialization and sustainable development. Improving urban areas in this manner was thought to be efficient, but could come at the cost of national equity. Over time, Lewis's thinking about the role of agriculture shifted towards an emphasis on the increase of agricultural productivity and demand for agricultural goods (Lewis, 1978). This view was shared by others such as Mellor (1976) and Meier (1989) who identified the importance of agriculture not only as surplus to support industrialization, but also to view it as an activity by itself that generates employment, growth and a more equal distribution of income.

In many developing countries, the urban-rural welfare gap accounts for an important element of inequality. Vietnam is a case in point and a useful

comparator for Sri Lanka given the countries' structural similarities. In a study on the Vietnamese urban-rural gap in welfare between 1993 and 2006, Thu Le and Booth (2014) employed a quantile regression technique and found that Vietnam's economic reforms such as the achievement of macroeconomic stability and the transition from a centrally-planned economy to a market economy in 1986, enabled households in urban areas to reap the benefits of the reforms (via higher returns to education) more than households in rural areas. Vietnam, like Sri Lanka experienced exceptional growth, but a rising urban-rural gap in welfare. However, since 2002, the urban-rural gap started to decline due to the development and industrialisation of rural areas. During the latter period, the urban-rural gap fell during a period of high growth bringing the rural households closer to urban households in terms of welfare.

Understanding the underlying factors affecting the urban-rural welfare gap is central to this paper. The growth of certain industries, education and other household characteristics have been identified in the literature as potential contributors to the gap in welfare between urban and rural households. Thu Le and Booth (2014) applied the Blinder-Oaxaca decomposition to the unconditional quantile regression which identified the crucial role played by remittances and the loosening of government controls allowing rural migrants to access urban facilities such as education, health insurance and owning a house. Domestic remittances became significant in improving rural household expenditure especially for the rural poor.

The impact of education and occupation choices on the falling urban-rural differences in wages was studied by Hnatkovska and Lahiri (2013) in the context of India between 1983 and 2010. Their findings suggest that almost 40 per cent of the wage convergence observed between urban and rural India was explained by converging individual characteristics such as education and occupation choices. Himaz and Aturupane (2011) applied a quantile regression to identify the importance of education on household welfare in Sri Lanka using five cross-section datasets between 1985 and 2006. Their paper found that people in higher quantiles who have greater consumption expenditure are more likely to have higher levels of education and better skills that complement education, thus enabling them to earn higher returns to education. The findings also indicated that residing in a rural area had a negative impact on the returns to education compared to residing in an urban area, especially at the top end of the welfare distribution. Finally, Sicular et al. (2007) examined the urban-rural gap in China and found that with better infrastructure and employment opportunities, people in rural areas can easily move to urban areas for employment. The paper noted that the exclusion of migrants and ignoring spatial price differentials across regions led to an over-estimation of the urban-rural gap.

3.2 Methods used in the literature

Measuring inequality is not straightforward. Many methods have been advanced to try to decompose inequality in order to better understand its causes. The Gini and Theil coefficients, for example, have been used often to decompose inequality into a within- and between-group component – how much of the inequality is due to inter-group effects and how much of it is due to intra-group effects. Although this helps understand the sources of inequality growth/decline, the between versus within decomposition does not identify the factors affecting the welfare or income distributions.

Methods allowing the entire conditional distribution (rather than just the conditional variance) to be estimated were introduced (such as Machado and Mata, 2005). This technique creates a counterfactual distribution for one of the two groups (rural, in this case) and compares it to the actual distributions in order to separate the urban-rural differences in welfare into two components – the first is the contribution of the differences in urban-rural household characteristics to the welfare gap (covariate effect; for example, the different education levels between the areas) and the second is how the differences in urban-rural returns to those characteristics contribute to the welfare gap (returns effect; for example, the returns to education).

The decomposition gives a better understanding of how the contributions of characteristics and returns to characteristics have changed over time in affecting the urban-rural welfare gap. Nguyen et al. (2007) implemented this method in Vietnam in the period of rapid growth and rising inequality, noting that differences in covariates explain most of the urban-rural expenditure gap at lower quantiles; but for the rest of the expenditure distribution, the gap was primarily due to urban-rural differences in the returns to covariates. However, the drawback of this approach is that the decomposition is not detailed enough to compute the sub-components of the covariate effect; that is, to identify the specific sources that give rise to the differences in covariate distributions between the urban and rural areas.

Firpo et al. (2009) introduced a new technique which is an extension of the Machado-Mata (2005) decomposition identifying the detailed components of both, the returns and covariate effects. This is done through the estimation of (re-centred) influence function (RIF, hereafter) regressions. In this context, the RIF can be regarded as an unconditional quantile regression. Instead of using the traditional conditional quantile regression, this technique used the unconditional quantile regression. Koenker and Bassett (1978) introduced the (conditional) quantile regression technique. This method estimates the effects of each explanatory variable on the entire distribution of expenditure. However, it is restrictive since a change in the distribution of covariates could change the

interpretation of the estimated coefficients (Firpo et al., 2009). Fortin (2008) and Firpo et al. (2009) estimated the effect of union status on log wages of men in the United States and found large differences between the results using the conditional and unconditional quantile regressions.

The estimates from the unconditional quantile regressions suggested that unionization progressively increases wages at the bottom end of the distribution, and reduces wages at the top end of the distribution which precisely explained the U-shaped changes observed in the actual wage data. The conditional regression results, in contrast, suggest that unionization has a positive yet monotonically declining effect on wages without taking into account the observed changing pattern of the wage distribution. It is clear that the two different methods interpret results differently. Therefore, for the purpose of this study where it is important to understand how each household characteristic contributes to the welfare gap, an unconditional quantile regression is suitable.

In order to analyse the welfare gap between urban and rural areas, the conventional methodology proposed by Blinder (1973) and Oaxaca (1973) can be implemented. This standard decomposition stems from the notion that differences in expenditure between urban and rural households may arise from three possible sources – differences in endowments, differences in returns to endowments, and differences in unobservable characteristics. However, the Blinder-Oaxaca decomposition technique is carried out at the mean of the expenditure distribution. For the analysis of the urban-rural gap, it is important to examine the entire distribution. Firpo et al. (2009) apply a variant of the Blinder-Oaxaca decomposition to the estimates obtained from the unconditional quantile regression. This method was used by Thu Le and Booth (2014) in their study of the urban-rural welfare gap in Vietnam and will be used in this paper.

This paper contributes to the existing literature in two ways. Firstly, it explores the welfare gap between urban and rural households in Sri Lanka during a period of rapid growth. This has not been examined to date - Himaz and Aturupane (2011) observed the effect of education on household welfare between 1985 and 2006 in Sri Lanka, however urban and rural households were pooled together. This paper extends the analysis to 2009/10 and isolates urban and rural households to identify welfare differences across the expenditure distribution and over time. Secondly from a methodological viewpoint, this paper adds a new dimension with the use of an unconditional quantile regression as opposed to the conventional quantile regression technique. The use of a decomposition technique allows a further examination of the urban-rural gap to identify which factors were crucial in changing the welfare gap over time and across the expenditure distribution. It thus extends the existing literature with a detailed analysis of the contributing factors to urban-rural welfare gaps in Sri Lanka between 2002 and 2009/10. The next section will explain the data used in the paper.

4. Data

4.1 Data and sample

The Household Income and Expenditure Surveys (HIES) of 2002 and 2009/10 are used in this study to cover the period of dramatic change in Sri Lanka. Data was collected in twelve consecutive monthly rounds in order to capture seasonal variations in income and consumption patterns. The 2002 survey was conducted from January 2002 through December 2002 and includes 16,920 households, and the 2009/10 survey was conducted from July 2009 through June 2010 and includes 17,182 households. For comparability, only provinces/districts included in both waves are included in the analysis – 17 out of the 25 districts in the country have been surveyed in both years.

In the HIES carried out in 2002, the Northern and Eastern provinces were excluded because of the ongoing war in these areas. By 2009/10, data collection commenced in 5 additional districts in the aforementioned provinces. However, the districts were not surveyed for the entire 12 months - the Vavuniya district in the Northern province and the entire Eastern province were surveyed for 10 out of the 12 months whereas the Jaffna district in the Northern province was surveyed for 7 months. The remaining 3 districts in the country were left out of the 2009/10 survey due to ongoing resettlement activities.

The excluded districts include 2,776 households in the 2009/10 survey data, 40 per cent of whom are from urban areas. The descriptive statistics for the excluded districts in 2009/10 suggest that these districts have lower real expenditure per capita at every quantile, on average in comparison to the rest of the country – particularly at higher quantiles where large urban-rural differences in expenditure are seen). Households are smaller and these districts are predominantly rural (see Appendix 2). Descriptive statistics on these excluded districts obtained from the HIES 2009/10 are discussed in Appendix 1.

The data sets contain information on several aspects of living standards, including household and individual demographics, education, health, migration, employment, income, and expenditure on food and non-food. The HIE surveys record remittance income transferred within the country, or received from abroad. The paper uses adult non-student characteristics at the household level. This category is defined as people aged between 15 and 65 who are not in education at the time of the survey[3].

3 It is not conditioned on whether individuals are working or not since it is important to include the contributions of those involved in household work and other paid/unpaid family activities to consumption expenditure

To compare the differences across urban and rural living standards, monthly household per capita expenditure was used – at 2002 prices. For the purpose of this study, the inclusion of private consumption (such as home-produced food) is an important indicator of economic welfare. Consumption data also reduces the issue of variability that income may have across the survey period (Deaton, 1997). Total household expenditure was calculated as the sum of expenditure on food and non-food items. Food expenditure includes the expenditure on purchased products as well as home-produced items. For home-produced items, the total quantity consumed was multiplied by the unit value if it were purchased in the market[4]. Non-food expenditure includes expenditure on housing[5], education, health, clothing, entertainment, communication, personal health care, household goods, transportation and vehicle maintenance.

Once we obtain total monthly expenditure (on food and non-food items) for a household, we then adjust for spatial variations in prices across the 17 districts. The price indices for both years (2002 and 2009/10) are presented in Appendix 2 (Table A2). According to the Department of Census and Statistics, Laspeyres price indices were calculated using unit prices of the typical consumer food basket for each district. Note that the price indices are observed at a given point in time at the district level, and are updated over the survey periods. By adjusting monthly expenditure to account for spatial price differences, we obtain expenditure values that are free from commodity price differences across districts. We are unable to disaggregate the indices further than district-level in order to observe price variations across urban and rural areas. However as shown in Table A2, the districts are either predominantly urban or rural – thus, the spatial price indices capture a part of the urban-rural price differences.

Next, the monthly household expenditure is converted into real terms. This is useful for the comparison of expenditure over time. In order to do this, household expenditure is divided by the Consumer Price Index (base year is 2002). Thus, the expenditure values are at 2002 prices. Finally to obtain per-capita values, the real expenditure is divided by the number of members in the household. The main variable of the analysis is obtained - real per capita expenditure (RPCE). In this manner, we are able to account for spatial price variations across regions, which Sicular et al. (2007) noted to be important when estimating the urban-rural gap.

We identify a caveat in the analysis as the data does not include information on migration – we are unable to identify individuals who may have migrated from

4 The HIES survey report explains that unit values were estimated according to the market value, including homegrown food or items received free of charge. This information is initially recorded in a separate form by the respondent (under the guidance of the enumerator during the visit to the household). It is later edited if necessary and recorded in the survey schedule by the enumerator.

5 Rent values were imputed for those living in their own house

rural to urban areas due to improved infrastructure, for example. However, we attempt to deal with this issue by including controls for remittance flows received from abroad or within the country. Workers' remittances have become an increasingly attractive source of financing over the past three decades in Sri Lanka. In 2010, remittances accounted for 8.3 per cent of GDP (World Banka data), which is high compared to countries of broadly equal size and other Asian countries in 2005 (Lueth and Ruiz-Arranz, 2007). This finding was confirmed by Himaz and Aturupane (2011) – the paper stated that the remittance flows across the country and from foreign countries increased by nearly eight-fold in real terms over the 20 years that were analysed – being 3 per cent of consumption in 1985 and 13 per cent in 2006.

The next section explores descriptive statistics in order to understand some of the key movements across urban and rural sectors, over time, and across rich and poor households.

4.2 Descriptive statistics

Table 2 gives the within-quintile means for the main variables of interest by "real per capita expenditure" (RPCE) for urban and rural households[6].

From Table 2, the *real per capita expenditure* (RPCE) at any point in the distribution and over time is higher for urban households relative to rural households. However the gap between urban and rural expenditure per capita appears to be less pronounced at lower quintiles compared to higher quintiles in a given year, and in 2009/10 compared to 2002. Most of the explanatory variables focus on adult non-students in the household, defined as individuals between the ages of 15 and 65 years but are not in education.

Household demographic characteristics include the number of individuals living in the household (*household size*), the proportion of children below the age of 15 in the household (*proportion of children),* the average age of the adult non-students and the age squared divided by 100 (*average age, age squared*), proportion of women and Sinhalese[7] adult non-students (*proportion of women/Sinhalese*) in the household. *Ethnic* minorities are rarer in the rural sector in comparison to the urban sector.

6 Rural and estate households have been pooled together for the purpose of comparison, and since the estate households have similar behaviour/characteristics to rural households.
Quintiles are defined in two ways – in this section which looks at the mean values, the quintiles are defined as the bottom 20%, second 20%, middle 20%, fourth 20% and top 20% of the urban or rural sample based on the household RPCE. Moving on to the quantile regression, quintiles are defined as a point in the expenditure distribution, rather than the number of people falling into a certain category.
7 Sinhalese form the biggest ethnic group; hence it will be taken as the default category.

Household size has a negative relationship with per capita expenditure implying that larger households are poorer, on average. However, due to size economies this could be biased upwards. Poorer households spend a greater proportion of their income on rival goods such as food. Yet their consumption of certain items such as clothing, housing, water taps, etc. are shared among several members in the household – such bulk purchases suggest that the cost per person is lower (with a given standard of living) when more individuals live together, rather than separately. A common belief is that larger households tend to be poorer. However, a paper by Lanjouw and Ravallion (1995) discuss that this relationship between household size and poverty/expenditure may vanish at a certain point due to size economies in consumption. The paper employed a method whereby the total expenditure is divided by the household size raised to a power less than one (given a value of θ). This value is known as the size elasticity. As the value of θ decreases, consumption expenditure and household size become statistically independent. At values of θ larger than the threshold value, bigger households tend to have lower expenditure. For Sri Lanka, the value of θ at which point the household size and expenditure begin to have the negative relationship is at 0.3 for urban households and 0.6 for rural households. The low value of θ for urban households suggests that there is a negative relationship between household size and expenditure; whereas for rural households, the correlation between poverty and household size may vanish when there are size economies in consumption.

Human capital is measured by the average number of years of education acquired by the adult non-students (*education*). The average education level increases across quintiles as expected for urban and rural sectors, and at any given point, it is higher for urban households than for rural households. Dummy variables are used to identify whether or not the household received remittance income from within Sri Lanka (*local remit*) or from abroad (*foreign remit*) during the year. At a given point in time, a greater proportion of rural households receive local remittance income whereas a greater proportion of urban households receive foreign remittance income. Both, foreign and local remittance transfers have increased over time – specifically foreign remittance income received by urban households and local remittance income received by rural households.

The type of employment (*wage*, *self-employed or not employed*) is accounted for by the variables that measure the proportion of adult non-students in the household who are working in wage employment, self-employment or are not in the labour force[8]. We use the reported income by individuals to distinguish between the wage employees and self-employed. Individuals with more than one source of income were distinguished as being either wage/self-employed by looking at the source which yielded the highest income. Looking at the descriptive

8 This category is for the adult non-students who are unemployed, retired/disabled and stay-at-home parents during the sample period.

statistics, there are a greater proportion of adults in some form of employment in the rural sector compared to the urban sector; this is true at any given point in the expenditure distribution and for both years. Both, being in wage and self-employment have a positive relationship with per capita expenditure across the distribution. Over time, the proportion of adults in urban areas working in self-employment has risen for the top end of the distribution and the proportion of adults in wage employment has fallen. In rural areas, the proportion of adults in wage employment has fallen over time whereas the proportion in self-employment has risen marginally.

Additional variables are used to account for the sector (*agriculture*, *manufacturing or services*) of the working adult non-students (that is, those in wage and self-employment) shown as proportions in the relevant form of employment (for example, the proportion of working adult non-students in the services industry). Per capita expenditure appears to have a negative relationship with agriculture employment and a positive relationship with service employment in both, urban and rural areas. Further, there is a larger proportion of agricultural workers and a smaller proportion of service sector workers in rural areas compared to urban areas. These findings are what would be expected in a developing country (Nguyen et al, 2007; Thu Le and Booth, 2014).

Having observed various changes in household characteristics, three interesting questions emerge. Firstly, what factors affect the urban and rural expenditure per capita, and how has it changed over time? Secondly, to what extent is household expenditure per capita determined by the observed productivity-related characteristics (as mentioned in this section) in urban and rural areas? Finally, how much of the urban-rural expenditure differential can be contributable to urban-rural differences in average characteristics, and how much of the expenditure differential can be contributable to the difference in returns to those characteristics and other factors which are not captured in the model? The paper proceeds as follows. Section 5 will look at the determinants of urban and rural expenditure per capita across the expenditure distribution in both years; in section 6, the results obtained will be used in a decomposition that will enable isolation of the factors that give rise to the urban-rural gap in expenditure.

Table 2: Within-quintile means of variables by log RPCE for urban and rural households

2002	Urban (3,240 households)					Rural (13,680 households)				
Variable	**1st**	**2nd**	**3rd**	**4th**	**5th**	**1st**	**2nd**	**3rd**	**4th**	**5th**
RPCE (at 2002 prices)	1497	2420	3506	5315	11639	1052	1562	2096	2945	6648
Household size	5.67	5.09	4.54	4.17	3.62	5.09	4.59	4.22	3.92	3.67
Children (proportion)	0.25	0.20	0.17	0.16	0.12	0.26	0.21	0.19	0.17	0.15
Average age	30	33	35	37	41	31	33	34	36	38
Education	4.72	6.97	7.67	8.85	10.08	4.64	5.50	6.04	6.91	8.63
Women (prop.)	0.50	0.50	0.52	0.51	0.52	0.49	0.49	0.50	0.50	0.50
Sinhalese (prop.)	0.56	0.65	0.71	0.74	0.78	0.79	0.80	0.81	0.87	0.92
Local remit (0,1)	0.04	0.03	0.05	0.05	0.05	0.06	0.06	0.05	0.06	0.05
Foreign remit (0,1)	0.05	0.06	0.10	0.07	0.08	0.03	0.04	0.04	0.05	0.05
Wage (prop.)	0.24	0.26	0.27	0.31	0.37	0.26	0.28	0.29	0.27	0.33
Self-employed (prop.)	0.08	0.11	0.11	0.11	0.11	0.11	0.14	0.16	0.18	0.17
Not employed (prop.)	0.68	0.63	0.62	0.58	0.52	0.63	0.58	0.55	0.55	0.50
Of the employed:										
Agriculture (prop.)	0.09	0.06	0.06	0.05	0.02	0.49	0.47	0.41	0.32	0.20
Manufacture (prop.)	0.28	0.21	0.20	0.22	0.18	0.19	0.19	0.20	0.21	0.19
Services (prop.)	0.63	0.73	0.74	0.73	0.80	0.32	0.34	0.39	0.47	0.61

2009/10	Urban (4,192 households)					Rural (12,990 households)				
Variable	**1st**	**2nd**	**3rd**	**4th**	**5th**	**1st**	**2nd**	**3rd**	**4th**	**5th**
RPCE (at 2002 prices)	1788	2817	3884	5465	12576	1453	2171	2876	3931	8060
Household size	5.57	4.72	4.36	4.05	3.49	5.01	4.44	4.16	3.93	3.55
Children (proportion)	0.22	0.18	0.17	0.15	0.11	0.21	0.19	0.17	0.16	0.13
Average age	32	34	36	39	43	32	34	37	37	40
Education	5.78	6.72	7.50	8.41	9.72	4.72	5.63	6.36	7.21	8.76
Women (prop.)	0.53	0.53	0.54	0.53	0.53	0.50	0.51	0.52	0.52	0.52
Sinhalese (prop.)	0.58	0.64	0.69	0.72	0.76	0.66	0.72	0.78	0.84	0.89
Local remit (0,1)	0.05	0.04	0.05	0.05	0.02	0.11	0.09	0.08	0.08	0.07
Foreign remit (0,1)	0.08	0.08	0.09	0.10	0.12	0.06	0.04	0.06	0.05	0.08
Wage (prop.)	0.24	0.24	0.26	0.28	0.31	0.24	0.26	0.26	0.25	0.30
Self-employed (prop.)	0.07	0.11	0.12	0.13	0.14	0.12	0.15	0.16	0.18	0.19
Not employed (prop.)	0.69	0.65	0.62	0.59	0.55	0.64	0.59	0.58	0.57	0.51
Of the employed:										
Agriculture (prop.)	0.11	0.09	0.08	0.06	0.07	0.49	0.43	0.38	0.29	0.20
Manufacture (prop.)	0.29	0.26	0.25	0.23	0.16	0.22	0.23	0.24	0.22	0.19
Services (prop.)	0.60	0.65	0.67	0.71	0.77	0.29	0.34	0.38	0.49	0.61

The key variable of interest is "real per capita expenditure", calculated in Sri Lankan rupees at 2002 prices (1 USD ≈ 146 LKR). The explanatory variables are computed using adult non-student characteristics. Education is measured as the average years of education obtained by adult non-students. The employment variables give the proportion of adult non-students in wage or self-employment, or not a part of the work force (not employed). The category of not being in employment is the adult non-students who are unemployed, retired/disabled and stay-at-home parents during the sample period. For the wage and self-employed adults, the sectoral variables capture the proportion of wage/self-employed adults in agriculture, manufacturing or the services sector

5. Determinants of urban and rural per capita expenditure

5.1 Method

The paper focuses on the link between household characteristics and real per capita expenditure (RPCE) across urban and rural areas. As per capita expenditure varies across the distribution in both, urban and rural areas, there is a need to examine the entire distribution of expenditure rather than simply focussing on the mean (as an Ordinary Least Squares estimation would do). For this purpose, a quantile regression is more suitable.

The unconditional quantile regression technique by Firpo et al. (2009)[9] estimates the impact of changes in the distribution of covariates (the explanatory variables) on the unconditional marginal distribution of log RPCE (the outcome variable). According to this method, a regression of the estimated re-centred influence function (RIF) on a set of explanatory variables is run. This approach of RIF uses the concept of the influence function. The influence function of a distributional statistic $v(y)$ represents the influence an observation has on the distributional statistic. Adding the distributional statistic $v(y)$ back to the influence function gives the RIF:

$$RIF(y; v) = v + IF(y; v) \quad (1)$$

The usual outcome variable Y (representing the natural logarithm of RPCE in this paper) in the regressions will be replaced by the re-centred influence function $RIF(y; v)$ of the statistic *v*. In the case of the mean, the influence function is: $IF(y; \mu) = y - \mu$

The RIF becomes:

$$RIF(y; \mu) = \mu + (y - \mu) = y \quad (2)$$

Since the $RIF(y; \mu)$ simply reduces down to the outcome variable *y*, the RIF regression for the mean corresponds to the standard Ordinary Least Squares (hereafter, OLS) wage regression; that is, if the mean is the statistic of interest, the estimation of RIF-OLS for the mean will become exactly the OLS estimation.

9 Firpo et al. (2009) explain the method in greater detail. For the purpose of this paper, a brief summary of the method is presented here. The regressions were run using the user-written STATA command *rifreg* by Firpo et al. (2009)

Similarly, the influence function can be computed for various quantiles of the expenditure distribution. At the quantile θ, the RIF will be:

$$RIF(y; q_\theta) = q_\theta + IF(Y; q_\theta) = q_\theta + \frac{\theta - 1\{y \leq q_\theta\}}{f_y(q_\theta)} \quad (3)$$

This new method used by Firpo et al. (2009) that estimates the unconditional quantile regression can be done through one of the three techniques: Ordinary Least Squares (namely, RIF-OLS), logistic (namely, RIF-logit) or non-parametric (namely, RIF-nonparametric). This paper uses RIF-OLS for simplicity[10]. The RIF estimations are then included in the regressions instead of log RPCE which will be explored in the next section.

5.2 Model specifications

To understand the relationship between the natural log of real per capita expenditure (RPCE) and various household characteristics, especially how they differ across urban and rural areas over the entire distribution of log RPCE, quantile regressions of the following form will be estimated:

$$Y_i = \alpha + \beta X_i + \gamma U_i + \delta U_i . X_i + \varepsilon_i \quad (4)$$

where "Y" is the dependent variable – log RPCE of household i, U_i is the urban dummy, X_i is the vector of explanatory variables for the household (excluding "u"), and $U_i . X_i$ is the interaction between the urban dummy and explanatory variables. The vector of coefficients β represents the returns to characteristics; γ and δ coefficients are the respective intercept and slope differential for the urban dummy variable. The explanatory variables (X_i) include education, demographic, employment and geographical characteristics of the household of adult non-students. To control for regional differences, dummies for regions will be included. The way each characteristic is captured was explained in Section 4.2.

This paper analyses the urban-rural gap in welfare in two stages. Firstly, the urban and rural households will be analysed separately to observe the factors affecting real per capita expenditure for both these sectors. The second part will be a decomposition of the urban-rural gap in the expenditure distribution. The total urban-rural gap can be disaggregated into two components. The first is the contribution of urban-rural differences in the distributions of covariates such as education to the urban-rural gap (covariate effect). The second component arises from the differences in the distributions of returns to these covariates (returns effect). To decompose the urban-rural gap across the log RPCE distribution and isolate the two effects, the results obtained from the quantile regression are

[10] Firpo et al. (2009) obtained similar results using all three estimation techniques

applied to a Blinder-Oaxaca decomposition. This technique will be discussed in greater detail in **Section 6** after estimating the quantile regressions to identify the factors affecting urban and rural real per capita expenditure across the distribution.

5.3 Results

In this section, the household level determinants of real per capita expenditure are analysed in urban and rural areas for both sample periods – 2002 and 2009/10. We start by testing whether the urban and rural samples need to be analysed in isolation. In order to do this, quantile regressions were estimated for the pooled sample (urban and rural) to test and confirm that there are significant differences in per capita expenditure across these two areas which are worth analysing further. The two tests that were conducted will be explained in detail below.

As noted from the descriptive statistics in Section 4.2, a "raw" gap in per capita expenditure was identified between urban and rural households. A regression allows us to control for several household factors and identify the "pure" gap which may or may not exist after controlling for other factors. The first test employs a model of Equation 4 that includes the intercept, urban dummy and the explanatory variables run at the mean using OLS and at selected quantiles using the unconditional quantile regression for the entire sample. The quantile regression allows for returns to vary with the households' positions in the distribution that are not accounted for by a mean regression. The inclusion of an urban dummy in a regression identifies the urban-rural gap in per capita expenditure as the "pure gap" after controlling for other factors.

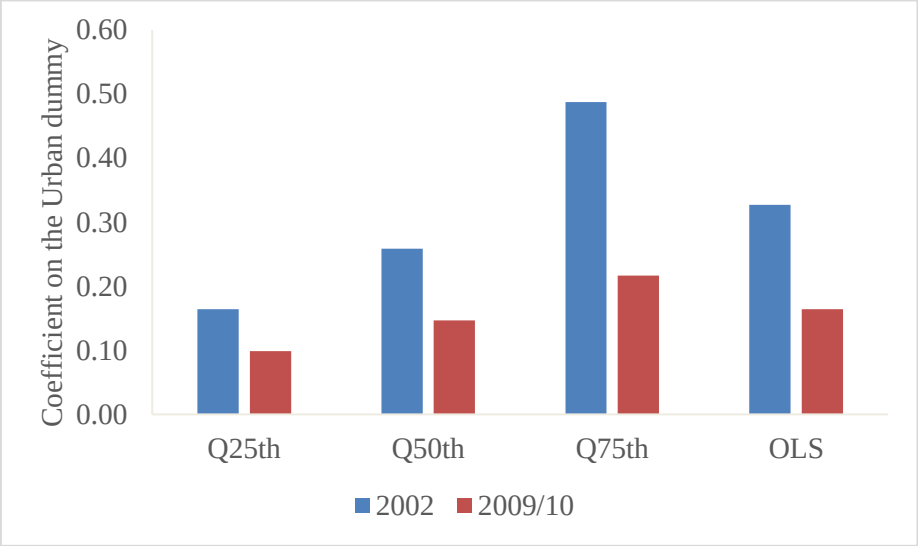
Figure 2 plots the coefficients on the urban dummy variables in a bar chart[11]. A detailed table of estimation results including household characteristics is given in the Appendix (Table A3). The coefficients are positive and significant suggesting that, other things being equal, an urban household has higher per capita expenditure than a comparable rural household. Between 2002 and 2009/10, the urban-rural gap has fallen; the coefficients on the urban dummies are lower in 2009/10 compared to the coefficients in 2002. In 2002, urban households spent 23 per cent more than their rural counterparts at the median. By 2009/10 this has dropped; urban households spent 14 per cent more than their rural counterparts (at the median).

Looking at the entire distribution at a given point in time, the coefficients on the urban dummies are increasing monotonically up the expenditure distribution which suggests that the urban-rural differences in per capita expenditure are higher for households at the top end of the distribution. This is true for 2002 as well as 2009/10. In 2002 for the 25th quantile, households in urban areas spent 16 per cent more than their rural counterparts. At the other end of the distribution at

11 Here we interpret the coefficient as (exp(β)-1) which is the exponential of the coefficient (β).

the 75th quantile, households in urban areas spent almost 50 per cent more than their rural counterparts. By 2009/10, the coefficients on the urban dummy variables are much lower at any given quantile, but are rising (from a 10 per cent expenditure differential at the bottom end to a 22 per cent differential at the top end of the distribution). This suggests that the per capita expenditure differences between urban and rural areas are larger for richer households.

Figure 2: Quantile regression for full sample (coefficients on urban dummies)



Having analysed the movements of the urban dummy across the distribution and over time, the above test confirms that there are indeed significant urban-rural differences in per capita expenditure at the 1 per cent significance level. In the next test we estimate Equation 4, including all variables being interacted with the urban dummy variable. The estimation results from this specification are given in the Appendix (Table A4). An F-test was carried out to test the hypothesis that all the coefficients of the interaction terms (between the urban dummy and the observables) are equal to zero. For both survey years, the test rejects the null hypothesis[12] – therefore, there are significant differences in the returns to household characteristics between urban and rural areas. The specification includes the intercept, urban dummy, the explanatory variables and the interaction terms of the urban dummy with the set of explanatory variables at the mean using OLS and at selected quantiles using the unconditional quantile regression framework. The interaction terms where the urban dummy is interacted with each explanatory variable identify urban-rural differences in the coefficients. Therefore,

12 The null hypothesis can be rejected at the 1 per cent significance level at the mean and the 25th, 50th and 75th quantiles. The P-value is 0.00 in all cases

we can directly test whether the *returns* to household characteristics (given by the β terms in equation 4) differ between the two sectors rather than solely focussing on the household characteristics (given by the X terms in equation 4). This has been used by Nguyen et al. (2007) and Thu Le and Booth (2014) in the case of Vietnam and is a useful way of identifying the most important factors affecting the urban-rural gap[13]. The coefficients on the urban dummy measure the urban-rural gap that is not explained by the covariates in the regressions. We note the insignificance of the urban dummy in most of the quantiles for both years (with the exception of the means in both years where the urban coefficient is significant at the 1 per cent level).

Having confirmed that urban-rural differences do exist even after controlling for household characteristics and that there are significant differences in returns to household characteristics between urban and rural areas, we move to the main part of the analysis. This involves examining the determinants of per capita expenditure at selected quantiles using the unconditional quantile regression for urban and rural sectors separately. The estimation results are reported in Tables 3 and 4.

13 The assumption made about the distribution of the error terms is different in comparison to using separate urban and rural samples – the use of interaction terms in a pooled sample assumes that the error terms are drawn out from the same error distribution. However, if the sample is split between urban and rural households, the error terms are different since they are drawn out from two separate samples.

Table 3: Determinants of urban household expenditure per capita at the mean and selected quantiles in 2002 and 2009/10

Variables	Q25th		Q50th		Q75th		OLS	
	2002	**2009/10**	**2002**	**2009/10**	**2002**	**2009/10**	**2002**	**2009/10**
Personal characteristics (average of non-student adults):								
Female	-0.017	-0.001	0.040	-0.087	-0.150*	-0.055	-0.068	-0.064
	(-0.27)	(-0.22)	(0.55)	(-1.63)	(-1.84)	(-0.82)	(-1.39)	(-1.57)
Sinhalese	0.138***	0.058**	0.065*	0.057**	-0.019	0.008	0.067***	0.023
	(4.22)	(2.06)	(1.85)	(2.19)	(-0.52)	(0.27)	(2.77)	(1.16)
Average age	-0.038***	-0.023***	-0.059***	-0.028***	-0.047***	-0.039***	-0.048***	0.030***
	(-7.32)	(-5.97)	(-10.25)	(-6.87)	(-7.34)	(-7.94)	(-12.43)	(-10.01)
Average age^2	0.045***	0.023***	0.077***	0.029***	0.067***	0.042***	0.064***	0.031***
	(7.69)	(5.18)	(11.51)	(6.44)	(8.88)	(7.23)	(14.02)	(9.14)
Education	0.116***	0.090***	0.120***	0.109***	0.137***	0.125***	0.113***	0.107***
	(19.97)	(19.77)	(24.98)	(25.93)	(21.48)	(23.99)	(31.86)	(31.06)
Job type (average of non-student adults; default – unemployed/not employed):								
Wage	0.029	0.052	0.371***	0.132**	0.465***	0.228***	0.389***	0.121***
	(0.44)	(0.92)	(4.72)	(2.25)	(5.15)	(3.05)	(6.84)	(2.68)
Self-employed	0.383***	0.370***	0.452***	0.378***	0.544***	0.397***	0.516***	0.353***
	(4.63)	(5.98)	(4.32)	(5.17)	(4.72)	(4.18)	(7.50)	(6.45)
Job sector (average of non-student adults; default - agriculture):								
Manufacturing	-0.076	-0.013	0.030	-0.052	0.057	-0.069*	-0.017	-0.049*
	(-1.32)	(-0.35)	(0.59)	(-1.46)	(1.11)	(-1.74)	(-0.48)	(-1.87)
Services	0.140***	0.152***	0.171***	0.169***	0.180***	0.181***	0.161***	0.166***
	(2.89)	(3.91)	(3.31)	(4.22)	(3.50)	(5.77)	(4.53)	(5.03)
Other demographic characteristics:								
Children	0.164*	0.229***	0.592***	0.249***	0.632***	0.279***	0.424***	0.234***
(proportion)	(1.68)	(2.93)	(5.76)	(3.26)	(5.94)	(3.23)	(6.12)	(4.13)

Household size (log)	-0.381*** (-12.09)	-0.462*** (-16.97)	-0.497*** (-14.61)	-0.478*** (-18.15)	-0.468*** (-12.67)	-0.498*** (-14.74)	-0.457*** (-18.89)	-0.487*** (-22.99)
Foreign remit (0,1)	0.308*** (6.52)	0.240*** (6.60)	0.264*** (4.46)	0.240*** (6.39)	0.209*** (3.35)	0.223*** (4.71)	0.237*** (6.03)	0.241*** (8.05)
Local remit (0,1)	0.215*** (3.47)	0.056 (0.99)	0.231*** (3.25)	0.033 (0.56)	0.252*** (3.17)	-0.085 (-1.36)	0.222*** (4.63)	-0.028 (-0.68)
Regions (default – Sabaragamuwa):								
Western	0.301*** (4.54)	0.325*** (5.24)	0.305*** (4.64)	0.291*** (5.47)	0.410*** (6.91)	0.339*** (6.02)	0.325*** (7.17)	0.307*** (7.31)
Central	0.174*** (2.38)	0.234*** (3.28)	0.208*** (2.83)	0.154** (2.43)	0.356*** (5.14)	0.162** (2.45)	0.241*** (4.75)	0.157*** (3.22)
Southern	0.027 (0.40)	0.323*** (4.88)	0.102 (1.38)	0.232*** (4.17)	0.216*** (3.20)	0.286*** (4.81)	0.104** (2.03)	0.258*** (5.92)
North West	0.139 (1.58)	0.240*** (3.21)	0.174* (1.92)	0.220*** (3.39)	0.273*** (3.31)	0.185** (2.57)	0.204*** (3.47)	0.193*** (3.69)
North Central	0.201** (2.13)	0.229*** (2.68)	0.084 (0.84)	0.235*** (3.00)	0.052 (0.53)	0.268*** (2.97)	0.103 (1.49)	0.249*** (4.02)
Uva	0.045 (0.46)	0.234** (2.55)	0.218** (2.18)	0.170** (2.08)	0.414*** (3.78)	0.102 (1.21)	0.141** (2.05)	0.195*** (3.02)
Constant	7.433*** (58.63)	7.815*** (74.38)	7.897*** (57.80)	8.207*** (82.06)	8.194*** (56.56)	8.731*** (73.95)	7.920*** (84.97)	8.326*** (109.72)
Number of observations	3,240	4,192	3,240	4,192	3,240	4,192	3,240	4,192
R-squared	0.24	0.19	0.29	0.25	0.25	0.23	0.43	0.36

Refer to Table A8 for a detailed explanation of how the variables were constructed; *t* statistics in parentheses; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$; the standard errors are bootstrapped with 500 replications

Table 4: Determinants of rural household expenditure per capita at the mean and selected quantiles in 2002 and 2009/10

Variables	Q25th		Q50th		Q75th		OLS	
	2002	**2009/10**	**2002**	**2009/10**	**2002**	**2009/10**	**2002**	**2009/10**
Personal characteristics (average of non-student adults):								
Female	0.011	-0.003	-0.012	-0.027	-0.085**	-0.082**	-0.016	-0.041*
	(1.44)	(-0.12)	(-0.42)	(-0.99)	(-2.22)	(-2.31)	(-0.75)	(-1.90)
Sinhalese	-0.100***	0.003	-0.069***	0.003	-0.041**	-0.030	-0.077***	-0.012
	(-5.22)	(0.14)	(-3.71)	(0.19)	(-2.03)	(-1.58)	(-5.33)	(-0.92)
Average age	-0.004*	-0.006***	-0.016***	-0.015***	-0.022***	-0.024***	-0.013***	-0.015***
	(-1.76)	(-2.93)	(-7.23)	(-7.58)	(-7.56)	(-9.34)	(-7.76)	(-9.54)
Average age^2	0.004*	0.005**	0.019***	0.015***	0.027***	0.027***	0.016***	0.015***
	(1.73)	(2.38)	(7.40)	(6.47)	(7.96)	(8.68)	(8.16)	(8.39)
Education	0.064***	0.064***	0.090***	0.083***	0.124***	0.107***	0.097***	0.089***
	(29.31)	(27.35)	(40.78)	(37.56)	(41.60)	(36.97)	(53.01)	(48.04)
Job type (average of non-student adults; default – unemployed/not employed):								
Wage	0.008	0.027	0.021	0.055	0.087**	0.179***	0.087***	0.109***
	(0.33)	(0.99)	(0.76)	(0.80)	(2.40)	(5.01)	(4.03)	(5.01)
Self-employed	0.251***	0.200***	0.291***	0.191***	0.278***	0.247***	0.294***	0.223***
	(8.56)	(6.71)	(8.66)	(6.11)	(6.06)	(5.73)	(11.58)	(9.04)
Job sector (average of non-student adults; default - agriculture):								
Manufacturing	0.049**	0.018	0.085***	-3.82×10^{-4}	3.49×10^{-5}	-0.059***	0.033**	-0.029**
	(2.61)	(0.97)	(4.48)	(-0.02)	(0.00)	(-2.93)	(2.23)	(-2.15)
Services	0.119***	0.112***	0.194***	0.166***	0.233***	0.191***	0.162***	0.131***
	(8.17)	(7.29)	(12.94)	(11.38)	(12.47)	(10.41)	(14.01)	(11.45)
Other demographic characteristics:								
Children	0.063*	0.186***	0.119***	0.198***	0.313***	0.302***	0.221***	0.237***
(proportion)	(1.68)	(4.72)	(3.13)	(5.46)	(6.60)	(6.80)	(7.44)	(8.22)
Household size	-0.361***	-0.356***	-0.467***	-0.426***	-0.489***	-0.474***	-0.443***	-0.422***

(log)	(-27.83)	(-24.81)	(-34.24)	(-30.98)	(-25.65)	(-25.70)	(-39.84)	(-37.25)
Foreign remit	0.140***	0.136***	0.186***	0.199***	0.214***	0.300***	0.218***	0.236***
(0,1)	(5.51)	(5.66)	(6.31)	(8.36)	(5.21)	(9.38)	(9.80)	(12.56)
Local remit	0.056**	0.020	0.086***	0.053**	0.131***	0.079***	0.103***	0.067***
(0,1)	(2.25)	(1.31)	(3.35)	(2.60)	(3.78)	(3.21)	(5.21)	(4.27)
Regions (default – Sabaragamuwa):								
Western	0.200***	0.202***	0.286***	0.230***	0.361***	0.285***	0.268***	0.221***
	(10.36)	(9.70)	(14.60)	(11.61)	(14.13)	(11.97)	(17.41)	(14.15)
Central	0.109***	0.012	0.104***	0.026	0.071***	0.101***	0.089***	0.039**
	(5.31)	(0.49)	(5.25)	(1.23)	(3.06)	(4.29)	(5.67)	(2.30)
Southern	0.110***	0.123***	0.158***	0.152***	0.103***	0.163***	0.109***	0.128***
	(5.00)	(5.46)	(7.33)	(7.36)	(3.99)	(6.93)	(6.50)	(7.99)
North West	0.071***	0.047*	0.080***	0.044*	0.044*	0.039	0.056***	0.025
	(3.27)	(1.93)	(3.74)	(1.93)	(1.70)	(1.52)	(3.33)	(1.44)
North Central	0.189***	0.129***	0.213***	0.155***	0.167***	0.181***	0.165***	0.135***
	(7.80)	(4.96)	(8.25)	(6.24)	(5.13)	(5.98)	(8.44)	(7.01)
Uva	-0.019***	-0.063**	0.026	-0.022	0.035	0.031	0.023	-0.020
	(-077)	(-2.20)	(1.14)	(-0.90)	(1.30)	(1.20)	(1.24)	(-1.04)
Constant	7.283***	7.564***	7.702***	8.008***	7.974***	8.373***	7.655***	8.015***
	(157.16)	(161.05)	(161.30)	(181.95)	(129.69)	(148.68)	(208.19)	(227.33)
Number of observations	13,680	12,990	13,680	12,990	13,680	12,990	13,680	12,990
R-squared	0.16	0.17	0.24	0.24	0.24	0.22	0.35	0.34

Refer to Table A8 for a detailed explanation of how the variables were constructed; *t* statistics in parentheses; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$; the standard errors are bootstrapped with 500 replications

Education of adults is positively related to household per capita expenditure in urban and rural areas, across the expenditure distribution, and in both survey periods. In 2002 at the median, an additional year of education increased household per capita expenditure by 9 and 12 per cent in rural and urban areas respectively. By 2010 at the median, the rural returns to education were 8.3 per cent and urban returns were 10.9 per cent. Further, the returns to education vary across the expenditure distribution; returns to education of the urban sector remain higher than returns to education of the rural sector. However, the returns between the two sectors became smaller across the distribution – in the 25th quantile in 2002, the urban returns to education were 11.6 per cent whereas rural returns to education were 6.6 per cent; by the 75th quantile, the urban returns to education were 13.7 per cent and rural returns were 12.4 per cent.

Next, consider the *employment type*. Households with adults working in self-employment consistently have higher per capita expenditure than comparable households with adults working in wage employment or not employed/unemployed across the expenditure distribution. Not being in the labour force has the greatest negative association with per capita expenditure. This is true for both, urban and rural areas. At any given point in the distribution, the returns to self-employment are higher for urban households compared to rural households. In 2002, the returns to self-employment in comparison to the returns to wage employment at the median were 45.2 per cent for urban households and 29.1 per cent for rural households. In 2010 at the median, the urban returns were 37.8 per cent and rural returns were 19.1 per cent. At a given point in time, the returns to self-employment rose across the expenditure distribution – with the exceptions of urban households in 2009/10 and rural households in 2002 when the returns remained fairly flat across the distribution. The fact that self-employment pays higher returns than wage employment could come across as an unusual finding. It can be explained in the following way. Parker (2009) stressed that wage returns differ from returns to self-employment for several reasons – firstly, it is difficult to interpret the salary of a self-employed individual as he/she chooses to pay this for him/herself; secondly, the returns to self-employment are not purely the return to labour, but also include the return to capital. Hence this finding must be treated with caution.

Job sectors must be considered to further examine the changing returns to employment. Households with adults working in agriculture have lower per capita expenditure relative to households working in services or manufacturing industries. This is in line with the finding observed by Thu Le and Booth (2014) in Vietnam. Rural and urban households where adults are working in services had the highest per capita expenditure – at the median, the returns to working in services was approximately 17 per cent higher compared to working in agriculture in both years for rural and urban households. For rural households, the returns from working in the service industry increased across quantiles – from 12 per cent at the 25th quantile in 2002 to 23 per cent at the 75th quantile - suggesting that richer households got higher returns from employment in this industry. A similar pattern was observed in 2009/10.

In urban areas, the coefficient on services does not vary across the distribution of expenditure – this is true for both years.

The proportion of children and the natural log of household size measured the effects of household *demographics*. The negative coefficient on household size suggests that bigger households have lower per capita expenditure. Thu Le and Booth (2014) found the same finding for Vietnam; the study also found that the proportion of children inversely linked to per capita expenditure – however, the opposite finding was observed for Sri Lanka where the presence of children in the household is linked with higher per capita expenditure. The coefficients on these two demographic variables become larger across the expenditure distribution suggesting that the negative link between house size and per capita expenditure, and the positive link between the presence of children and per capita expenditure are greater for richer households. As observed in Section 4.2, the negative relationship between household size and expenditure may possibly vanish at a size elasticity of 0.6 for rural households due to size economies of consumption. However for urban households, we observed a low value of the size elasticity (0.3) suggesting that larger households are likely to have less expenditure.

The receipt of foreign and local *remittances* is positively associated with urban and rural per capita expenditure in both years. Remittance flows were measured by a dummy variable which had a value of 1 for households that received foreign/local remittance income or a value of zero otherwise. Firstly, the impact of foreign remittances on per capita expenditure is discussed. An urban (rural) household obtaining foreign remittance had approximately 25 (19) per cent higher per capita expenditure than their counterparts at the median of the expenditure distribution – the coefficients are similar in both years. For rural households, the positive relationship between foreign remittance and per capita expenditure rose greatly across the expenditure distribution especially in 2010 – this implies that receiving foreign remittance had a larger positive link with per capita expenditure for richer rural households in comparison to poorer households. In 2009/10 at the 25^{th} quantile, rural households receiving foreign remittances had 14 per cent more per capita expenditure, and at the 75^{th} quantile, they were 30 per cent better off compared to those who did not receive foreign remittances. Thu Le and Booth (2014) explained this in the following way – in order for an individual in the family to migrate to a foreign country for the purpose of working, the family will incur an initial cost (this cost could be for travel, setting up, acquiring skills, learning the language). For poorer households, this cost is likely to be covered by borrowing. Once the poor families start receiving foreign remittances, they will first have to pay the borrowed money back before they use the remittance receipt for their expenditure. Hence, a rich household could have a larger increase in their expenditure once they have received foreign remittances compared to poor households since they do not have to re-pay borrowed money. For urban households receiving foreign remittances, in 2002 the

positive effect decreases across the expenditure distribution but in 2009/10 the effect is fairly stagnant across the distribution.

Domestic remittances also had a positive association with urban and rural per capita expenditure; however an exception was 2009/10 for urban households where local remittances shared no significant association (at the 10 per cent level) with per capita expenditure at any point in the distribution. In 2002 however, urban households receiving domestic remittances had 22 per cent more per capita expenditure compared to those who do not receive domestic remittances at the 25th quantile with the effect becoming slightly larger for richer households (25 per cent). For rural households in 2002, receiving domestic remittances had an increasingly positive association with per capita expenditure across the distribution suggesting that richer households further benefitted from receiving this form of income. However in 2009/10, local remittances had a significant and positive relationship with rural per capita expenditure at the median and 75th quantile (at the 1 per cent significance level) but not at the 25th quantile. The coefficient on the domestic remittance variable is however always smaller than the coefficient of the foreign remittance variable; at the median in 2009/10, rural households receiving foreign remittances had 20 per cent higher per capita expenditure relative to those who did not, whereas rural households receiving local remittances saw a 5 per cent rise in per capita expenditure compared to those who did not receive this income. This infers that households receiving income from abroad are likely to have higher per capita expenditure compared to households receiving domestic transfers.

Finally, the *region* dummy variables give some noteworthy findings. The Western province has the highest living standards; this is true across urban and rural areas. This is consistent with the fact that the capital city, Colombo, is a part of the Western province. Colombo is the major economic centre in Sri Lanka and has the lowest incidence of poverty. Although the Western province is primarily urban, almost 30 per cent of population in this province is from the rural sector according the Census of Population and Housing (2011). Additionally, the findings show that the rural poor of the Uva province have the lowest standard of living with the exception of the 75th quantile.

The results obtained so far suggest that the return to working in certain types of employment, education, and other household demographics are significant indicators of urban and rural per capita expenditure. Further, regression estimations from the pooled sample suggested that the urban dummy is highly significant – therefore, there are urban-rural differences in per capita expenditure that can be explained by differences between the two areas due to household endowments and the differences in returns to endowments. Given the recent changes in the Sri Lankan economy during the period of analysis, including the end of a civil war, growth of industry and a reduction in poverty, our results are in line with these changes. Further, the importance of remittances, services sector and education are in line with findings in

literature on other developing countries. The next section of the paper will identify the contribution of each covariate used in the former regressions to the urban-rural expenditure gap, and how the composition of the gap has changed over time.

6. Factors contributing to the urban-rural gap in expenditure

6.1 Method

The urban-rural differences in the distribution of log RPCE can be due to two reasons – (1) differences in household characteristics between urban and rural areas, or (2) differences in the returns to those characteristics between urban and rural areas. As observed from the previous section, differences in returns do explain the differences in per capita expenditure between households in urban and rural areas – this section will look at the magnitude of the contribution and how it has changed between 2002 and 2009/10 which will help explain the changing pattern of the urban-rural welfare gap. More importantly, the impact of each observable characteristic (for example, education) or the returns to those characteristics (returns to education) on the urban-rural gap can be estimated. This is done by applying a decomposition technique to the estimation results obtained in the previous section - for urban and rural households.

In order to carry out this decomposition, the Blinder-Oaxaca decomposition (Blinder, 1973; Oaxaca, 1973) is used[14]. The form of the decomposition is as follows:

$$(5) \qquad \hat{Y}_u - \hat{Y}_r = (\hat{X}_u - \hat{X}_r)\hat{\beta}_r + (\hat{\beta}_u - \hat{\beta}_r)\hat{X}_r + (\hat{X}_u - \hat{X}_r)(\hat{\beta}_u - \hat{\beta}_r)$$

where Y is the natural logarithm of real per capita expenditure (RPCE) for the household, hence $\hat{Y}_u - \hat{Y}_r$ is the difference in log RPCE between urban and rural areas. $\hat{X}$ is a vector of observed characteristics, $\hat{\beta}$ is a vector of estimated coefficients obtained from running the regression model of log RPCE on a set of explanatory variables and a constant. This is a three-fold decomposition, where the differences in log RPCE can be explained in three parts.

The first part is given by:

$$(\hat{X}_u - \hat{X}_r)\hat{\beta}_r$$

which is the expenditure differential that is due to differences in household characteristics between urban and rural areas (the *endowment* effect).

[14] The decomposition was run using the STATA command *oaxaca8* by Firpo et al. (2009) which they employed in their paper

The second part is given by:

$$(\hat{\beta}_u - \hat{\beta}_r)\hat{X}_r$$

which is the expenditure differential that is due to differences in returns to household characteristics between urban and rural areas (the *coefficient* effect). It looks at the contribution of differences in coefficients of the urban and rural household regressions (including differences in the intercepts) to the overall expenditure gap.

The third part is given by:

$$(\hat{X}_u - \hat{X}_r)(\hat{\beta}_u - \hat{\beta}_r)$$

which is an interaction term accounting for the fact that there could be differences in endowments and coefficients existing simultaneously between the two groups.

The decomposition given by Equation 5 is estimated from the viewpoint of rural households; that is, the endowment effect measures the expected change for the group of rural households' mean expenditure per capita (or at a given quantile which will be explained further below) if rural households had urban characteristics. Similarly, the coefficient effect measures the expected change for the group of rural households' mean expenditure per capita (or at a given quantile) if rural households received returns of urban households[15].

A limitation of the Blinder-Oaxaca decomposition for the purpose of analysing urban/rural expenditure differences across the entire distribution of expenditure is that it could only be applied to the mean. The unconditional quantile regression, however, as introduced by Firpo et al. (2009) obtains an estimate of the marginal impact of a unit of change in any explanatory variable on the unconditional quantiles of log RPCE (discussed in Section 5.1). This enables an application of the Blinder-Oaxaca decomposition directly to the estimation results obtained from the unconditional quantile regression.

There are two advantages of using this over other methods. Firstly, there is no need to run several simulations – as is the case with the conditional quantile regression decomposition put forward by Machado and Mata (2005). The technique by Machado and Mata (2005) estimates the entire conditional distribution F_x over a new distribution G_x in order to obtain a counterfactual unconditional distribution of Y for rural households (where Y is the main variable

15 Alternatively, we can carry out a reverse three-fold decomposition to estimate the three effects from the viewpoint of urban households. However, the command "oaxaca8" is used for decomposition at different quantiles, rather than the "oaxaca" command for the decomposition at the mean – the former does not allow estimation of the reverse decomposition.

of interest, log real per capita expenditure). The counterfactual distribution is then compared with the empirical distributions for urban and rural households to identify the differences in characteristics and returns to characteristics that exist between the two groups. By contrast, RIF estimates the conditional distribution F_x only at one specific point in the distribution. Secondly, the use of the Blinder-Oaxaca decomposition allows us to isolate the contributions made by the differences in urban-rural returns and characteristics from *each* explanatory variable to the urban-rural expenditure gap at any given quantile along the distribution.

6.2 Results

Table 5 reports the urban-rural expenditure gap in 2002 and 2009/10, along with the contributing factors at the mean and selected quantiles. The total predicted gap at a particular point in time rose across the expenditure distribution suggesting that differences in per capita expenditure between urban and rural households are higher amongst richer households – in 2002 (2009/10), the overall expenditure gap between urban and rural households was 0.42 (0.25) log points at the 25th quantile and rose to 0.60 (0.33) log points at the 75th quantile. Over time, the expenditure gap has fallen sharply – at the median in 2002, the predicted gap was 0.51 log points and it fell to 0.30 log points by 2009/10. This fall in the urban-rural welfare differences over time is in line with what we have observed in the Sri Lankan economy, including the fall in poverty (particularly rural poverty), high growth and the end of the war.

In both years, the urban-rural expenditure gap arose from two factors: the urban-rural differences in endowments (differences in X terms of the regression), and the differences in returns they get from those endowments[16] (coefficients; that is, differences in β terms). The welfare gap is reduced by the differences in endowments interacted with the differences in returns (interaction terms; that is, differences in $X^*\beta$) – with one exception in 2002 (at the 25th quantile) where the interaction effect led to an increase in the welfare gap. In 2002, the expenditure gap can be explained more by the differences in returns rather than the differences in endowments at any point on the distribution. In 2010, this is true at the 25th and 50th quantiles; however at the 75th quantile, the differences in endowments and the differences in returns contribute equally to the overall expenditure gap. The differences in characteristics interacted with the differences in the returns to characteristics simultaneously (as given by the interaction term in the decomposition) reduced the welfare gap, especially for the richest households – an

[16] The rural returns are matched with urban characteristics to observe differences in returns between urban and rural households; that is, how much rural households would receive if they were endowed with urban characteristics

exception was noted in 2002 at the 25th quantile where the interaction effect *increased* the welfare gap by 12 per cent.

In order to identify the underlying factors that contributed towards the differences in endowments, returns and the simultaneous differences between the two former effects, some key household characteristics will be examined and discussed.

Considerable differences in *endowments* between urban and rural households that contribute towards the urban-rural expenditure gap will be discussed, namely education, regional differences, sector of employment and employment activity. Education was the largest contributing variable in both years – higher education levels by urban households compared to rural households explained over 60 per cent of the "endowment effect" at any point across the expenditure distributions in 2002; by 2010, the contribution of education differences increased across the expenditure distribution from 58 to 63 per cent between the 25th and 75th quantiles. At the median in 2002 (2009/10), differences in education levels accounted for 0.14 (0.09) log points of the differences in per capita expenditure between urban and rural households.

Regional differences were the second largest contributor towards the expenditure gap as an endowment – approximately 30 per cent of the total endowment effect was explained by regional differences. At the median, differences in regional characteristics between urban and rural households contributed by 0.07 log points to the expenditure gap in 2002, and by 0.05 log points in 2009/10. Across the distribution, regional differences contributed more towards the higher welfare gap at the top end of the expenditure distribution in 2002, whereas these differences contributed less at higher quantiles in 2009/10.

Urban-rural differences in endowments by sector of employment (employment in agriculture, manufacturing or services) had the third largest contribution towards the endowment effect in both years. At the median, sectoral differences between urban and rural households caused the expenditure gap to increase by 0.05 log points in 2002 and 0.03 log points in 2009/10. In 2002, the differences by sector of employment contributed by 20 per cent across the distribution, whereas in 2009/10, urban-rural differences in endowments by sector of employment contributed by 13 per cent at the 25th quantile, increasing to a 21 per cent contribution at the 75th quantile. This suggests that such differences have a smaller role to play in explaining the expenditure gap for richer households compared to poorer households.

Differences in the type of employment activity (wage, self-employed, not employed) between urban and rural areas caused the expenditure gap to fall. In 2002 and 2009/10, at the median it explains 6 per cent of the total endowment effect. In 2002 across the distribution, the differences contribute less towards the

endowment effect and overall gap at higher quantiles. However in 2009/10, these differences contribute uniformly across the distribution. Other endowments where urban-rural differences in the characteristics contributed towards a fall in the welfare gap include urban-rural differences in age, household size and the proportion of children. On the other hand, ethnic differences (significant at the 1 per cent level only in 2002) and the transfer of remittance income contribute to a rise in the welfare gap.

Next, some key factors that contributed to the expenditure gap through the differences in *returns* will be discussed. In both years, differences in the returns to employment by age contributed towards a reduction of the "coefficient effect"; although the contribution fell across the expenditure distribution especially in 2002 whereas other factors contributed to a rise in the welfare gap.

Urban-rural differences in returns to education had a large contribution towards the coefficient effect. In 2002, the contribution of the differences in returns to education at the median was 0.38 log points, and in 2009/10 the contribution was 0.17 log points. Across the distribution, the contribution of differences in returns to education fell. In 2009/10, the contribution of this variable at the 25th quantile was 0.16 log points; at the 75th quantile however, differences (0.12 log points) contributed less to a higher endowment effect. This pattern observed by the evolution of the urban-rural gap in returns to education for the lower and middle parts of the expenditure distribution (0.38 log points at the median in 2002 and reducing to 0.17 log points by 2009/10) contribute greatly towards the narrowing of the overall urban-rural gap in per capita expenditure between 2002 and 2009/10.

In 2002, differences in returns to regional characteristics between urban and rural households had a larger impact on richer households, whereas in 2009/10, regional differences had no impact at the 75th quantile, but a large impact on poorer households. This suggests that the differences in returns across regions mattered primarily for the poor in 2009/10. While differences in returns to education and regional characteristics matter less for the richer households in 2009/10, the intercept term is significant at the 1 per cent and contribute greatly towards the welfare gap in 2009/10 at the 75th quantile. This term includes the urban-rural differences in factors not captured in the model.

In 2009/10, the contribution of the constant term increased across the expenditure distribution. However in 2002, this constant term was insignificant (at the 10 per cent level) suggesting that the model included covariates that explain the expenditure gap quite accurately. The paper by Thu Le and Booth (2014) noted that the intercept was an important contributor at certain points in the distribution for the Vietnam analysis; it was stated that factors such as infrastructure and geographic conditions in favour of urban households might be useful in explaining

the gap. Unobservable factors, such as those discussed by Thu Le and Booth (2014) can be possible explanations for the contribution of the intercept term towards the overall coefficient effect in 2009/10 in our analysis.

Sectoral differences in returns contribute towards a reduction in the welfare gap, especially in 2009/10. This suggests that the urban-rural differences in returns from working in a particular industry (agriculture, manufacturing and services) were more important in explaining the welfare gap of the rich. Other factors that contributed towards the urban-rural gap include inter-group differences by returns to ethnicity and remittances. The differences in returns by ethnic characteristics explain a substantial part of the overall expenditure gap between urban and rural areas in 2002, however the effects are smaller in 2009/10. Remittance flows contribute by 7 per cent to the total coefficient effect at the 25th quantile, falling to 2 per cent at the 75th quantile in 2002. On the other hand in 2009/10, remittance flows contribute towards a reduction of the coefficient effect by 10 per cent at the highest quantile. Urban-rural differences in returns to demographic characteristics (household size and the presence of children in the household) contribute towards an increase in the welfare gap in 2002, and a decrease in the welfare gap in 2009/10.

The *interaction* effect measures the contribution of simultaneous differences in characteristics and the returns to such characteristics across urban and rural households towards the urban-rural welfare gap. In 2002, the interaction effect increased the welfare gap by 12 per cent at the 25th quantile; however this contribution fell across the distribution – at the 75th quantile, the interaction effect contributed to a fall in the welfare gap by 14 per cent. In 2010, the interaction effect reduced the welfare gap by 7 per cent at the 25th quantile; at the 75th quantile, this effect contributed to a 12 per cent fall in the welfare gap.

To summarize, the decomposition results suggest that the welfare gap rises across the distribution at a given point in time. Over time, the urban-rural welfare gap has fallen. Overall, differences in characteristics such as education, job sector (agriculture, manufacturing and services), regional differences and remittance flows contribute to a higher welfare gap whereas differences in demographic characteristics (household size and the presence of children) and job type (wage, self-employed, unemployed/not employed) contribute to a lower gap. The differences in *returns* to characteristics changed greatly over time – differences in returns to education, job type and regions contributed less towards the gap at higher quantiles. On the other hand, returns to unobservable characteristics have a large role to play in 2009/10, especially for richer households.

For the purpose of comparison over time, we examined the determinants of per capita expenditure for urban and rural households and estimated the urban-rural welfare gap for the 17 districts included in both years. Tables A5, A6, and A7 in

the Appendix include the additional 5 districts and estimate the determinants of urban/rural per capita expenditure and the urban-rural welfare gap for 2009/10[17]. Having examined the determinants of per capita expenditure, the results suggest that the coefficients are lowered when the 5 additional districts are included - the returns to education are lower at any point in the expenditure distribution for both, urban and rural households, compared to the coefficients obtained for the restricted sample. Furthermore, the urban-rural welfare gap is lower – at the median, the gap is 0.261 log points compared to 0.302 log points obtained for the 17 districts. There is a change in the composition of the endowment, coefficient and interaction effects when estimating the welfare gap for all 22 districts in 2009/10. The contribution of the differences in urban-rural characteristics and the contribution of simultaneous differences in urban-rural characteristics and returns to those characteristics towards the total welfare gap is *lower* (43 per cent and -8 per cent respectively at the median, compared to 50 and -12 per cent for the restricted sample). On the other hand, the contribution of the differences in returns to urban-rural characteristics towards the welfare gap is *higher* (65 per cent of the overall gap at the median, in comparison to 62 per cent for the restricted sample).

17 However, it is important to note that the additional five districts were estimated for certain months of the years.

Table 5: Contributions to the urban-rural expenditure gap at the mean and selected quantiles in 2002 and 2009/10

	2002				2009/10			
	Q25th	Q50th	Q75th	OLS	Q25th	Q50th	Q75th	OLS
Predicted Gap $[\widehat{Y}_u - \widehat{Y}_r]$	**0.423*** (26.55)**	**0.507*** (28.00)**	**0.598*** (30.71)**	**0.500*** (35.66)**	**0.252*** (18.53)**	**0.302*** (21.97)**	**0.333*** (20.69)**	**0.296*** (25.93)**
Due to endowments $[(\widehat{X}_u - \widehat{X}_r)\widehat{\beta}_r]$**:**								
Female	1.78x10^{-4}	-1.88x10^{-4}	-0.001*	-2.57x10^{-4}	-5.98x10^{-5}	-4.82x10^{-4}	-0.001**	-0.001*
	(0.42)	(-0.41)	(-1.90)	(-0.71)	(-0.12)	(-0.95)	(-2.06)	(-1.75)
Sinhalese	0.015***	0.010***	0.006**	0.012***	-2.71x10^{-4}	-3.31x10^{-4}	0.003	0.001
	(5.01)	(3.63)	(2.02)	(5.12)	(-0.14)	(-0.19)	(1.56)	(0.92)
Age	-9.64x10^{-4}	-0.004***	-0.004**	-0.003***	-0.002***	-0.005***	-0.006***	-0.005***
	(-1.31)	(-2.80)	(-2.51)	(-2.67)	(-2.68)	(-3.84)	(-3.46)	(-3.92)
Education	0.096***	0.136***	0.188***	0.148***	0.069***	0.090***	0.117***	0.097***
	(19.24)	(21.63)	(21.75)	(22.99)	(16.16)	(17.68)	(17.62)	(18.50)
Job Type	-0.012***	-0.014***	-0.013***	-0.014***	-0.009***	-0.009***	-0.011***	-0.010***
	(-7.28)	(-7.37)	(-5.59)	(-9.09)	(-6.22)	(-5.75)	(-5.00)	(-7.49)
Job Sector	0.031***	0.050***	0.060***	0.041***	0.015***	0.034***	0.039***	0.027***
	(7.86)	(12.03)	(11.22)	(12.61)	(6.91)	(10.20)	(9.16)	(9.98)
Demographics	-0.023***	-0.031***	-0.035***	-0.031***	-0.015***	-0.018***	-0.020***	-0.018***
	(-6.93)	(-7.29)	(-8.01)	(-7.97)	(-5.39)	(-5.39)	(-5.50)	(-5.50)
Remittances	0.004***	0.005***	0.005***	0.006***	0.004**	0.005***	0.008***	0.006***
	(3.46)	(3.61)	(3.05)	(4.27)	(2.62)	(3.21)	(3.53)	(3.80)
Region	0.045***	0.067***	0.098***	0.067***	0.049***	0.053***	0.060***	0.052***
	(10.29)	(13.32)	(13.48)	(16.35)	(12.73)	(13.30)	(11.34)	(15.67)
Total	**0.155*** (18.41)**	**0.220*** (22.64)**	**0.301*** (24.02)**	**0.225*** (24.67)**	**0.119*** (16.14)**	**0.150*** (19.11)**	**0.187*** (19.13)**	**0.148*** (20.08)**

Due to coefficients $[(\widehat{\boldsymbol{\beta}}_{\boldsymbol{u}} - \widehat{\boldsymbol{\beta}}_{\boldsymbol{r}})\widehat{\boldsymbol{X}}_{\boldsymbol{r}}]$**:**								
Female	-0.014	0.026	-0.032	-0.026	0.001	-0.031	0.014	-0.012
	(-0.42)	(0.66)	(-0.73)	(-0.97)	(0.03)	(-1.01)	(0.35)	(-0.52)
Sinhalese	0.200***	0.112***	0.018	0.121***	0.043	0.042*	0.046*	0.028
	(6.27)	(3.36)	(0.52)	(5.12)	(1.60)	(1.73)	(1.08)	(1.47)
Age	-0.510***	-0.535***	-0.211*	-0.430***	-0.318***	-0.198***	-0.266***	-0.249***
	(-5.32)	(-5.31)	(-1.81)	(-6.04)	(-4.25)	(-2.67)	(-2.99)	(-4.48)
Education	0.330***	0.384***	0.085*	0.225***	0.162***	0.171***	0.119***	0.121***
	(8.41)	(9.43)	(1.90)	(7.78)	(4.92)	(5.52)	(3.04)	(4.71)
Job Type	0.026	0.125***	0.149***	0.115***	0.034	0.057**	0.034	0.024
	(0.86)	(3.46)	(3.60)	(4.64)	(1.37)	(2.19)	(1.00)	(1.17)
Job Sector	-0.015	-0.110***	-0.086***	-0.071***	-0.054**	-0.086***	-0.122***	-0.067***
	(-0.51)	(-3.62)	(-2.83)	(-3.40)	(-2.30)	(-3.86)	(-4.87)	(-4.04)
Demographics	-0.008	0.052	0.091	0.022	-0.136***	-0.061	-0.037	-0.089***
	(-0.16)	(0.97)	(1.49)	(0.57)	(-3.21)	(-1.47)	(-0.69)	(-2.68)
Remittances	0.016***	0.011**	0.006	0.007**	0.008	$6.48X10^{-4}$	-0.019***	-0.008*
	(3.67)	(2.25)	(1.12)	(2.14)	(1.40)	(0.11)	(-2.70)	(-1.78)
Region	0.040	0.037	0.138**	0.067	0.158***	0.094*	0.078	0.113***
	(0.68)	(0.63)	(2.58)	(1.60)	(2.75)	(1.91)	(1.50)	(2.90)
Constant	0.150	0.195	0.220	0.265**	0.251**	0.198*	0.358***	0.311***
	(1.11)	(1.35)	(1.40)	(2.49)	(2.18)	(1.81)	(2.74)	(3.72)
Total	**0.215*** **	**0.296*** **	**0.379*** **	**0.295*** **	**0.149*** **	**0.188*** **	**0.187*** **	**0.171*** **
	(8.43)	**(11.41)**	**(14.79)**	**(16.62)**	**(7.84)**	**(10.55)**	**(9.49)**	**(12.67)**
Interaction $[(\widehat{\boldsymbol{X}}_{\boldsymbol{u}} - \widehat{\boldsymbol{X}}_{\boldsymbol{r}})(\widehat{\boldsymbol{\beta}}_{\boldsymbol{u}} - \widehat{\boldsymbol{\beta}}_{\boldsymbol{r}})]$**:**								
Female	$-4.50x10^{-4}$	$8.24x10^{-4}$	-0.001	$-8.29x10^{-4}$	$-3.46x10^{-5}$	-0.001	$4.81x10^{-4}$	$-4.33x10^{-4}$
	(-0.41)	(0.63)	(-0.69)	(-0.92)	(0.03)	(-0.97)	(0.34)	(-0.50)
Sinhalese	-0.036***	-0.020***	-0.003	-0.022***	-0.006	-0.006*	-0.004	-0.004
	(-5.94)	(-3.32)	(-0.52)	(-4.93)	(-1.60)	(-1.71)	(-1.08)	(-1.46)

Age	-0.008**	-0.006*	$-3.27x10^{-4}$	-0.005	-0.006***	-0.003*	-0.005**	-0.005***
	(-2.62)	(-1.72)	(-0.10)	(-1.69)	(-2.98)	(-1.83)	(-2.37)	(-2.84)
Education	0.079***	0.092***	0.020*	0.054***	0.027***	0.029***	0.020***	0.020***
	(7.99)	(8.84)	(1.89)	(7.44)	(4.77)	(5.32)	(3.00)	(4.58)
Job Type	-0.006	-0.008	-0.013**	-0.011***	-0.008**	-0.008**	-0.006	-0.006**
	(-1.49)	(-1.35)	(-2.01)	(-2.78)	(-2.51)	(-2.20)	(-1.29)	(-2.20)
Job Sector	0.004	-0.048***	-0.048***	-0.029***	-0.015*	-0.033***	-0.047***	-0.023***
	(0.28)	(-3.44)	(-3.36)	(-2.97)	(-1.75)	(-3.84)	(-4.84)	(-3.68)
Demographics	-0.003	-0.010***	-0.004	-0.004*	-0.004***	-0.002	-0.001	-0.003**
	(-1.00)	(-2.82)	(-1.19)	(-1.85)	(-2.77)	(-1.60)	(-0.53)	(-2.21)
Remittances	0.004*	0.001	-0.001	$-4.73x10^{-4}$	0.003	0.002	0.004	0.004*
	(1.79)	(0.48)	(-0.49)	(-0.30)	(0.88)	(0.78)	(1.19)	(1.87)
Region	0.021*	-0.010	-0.032**	-0.003	-0.007	-0.014	-0.002	-0.008
	(1.82)	(-0.84)	(-2.32)	(-0.37)	(-0.71)	(-1.57)	(-0.19)	(-1.11)
Total	**0.053****	**-0.009**	**-0.083*****	**-0.021**	**-0.017**	**-0.036****	**-0.041****	**-0.024****
	(2.57)	**(-0.42)**	**(-3.57)**	**(-1.35)**	**(-1.14)**	**(-2.57)**	**(-2.46)**	**(-2.21)**
Number of observations	16,920	16,920	16,920	16,920	17,182	17,182	17,182	17,182

The decomposition was estimated from the viewpoint of rural households. Base categories: Male (gender), non-Sinhalese (ethnic background), not employed (job type), agriculture (job sector), Sabaragamuwa (region) *z* values in parentheses; Demographic characteristics include household size (log) and the number of children; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$; the standard errors are bootstrapped with 500 replications

7. Conclusion

In this paper, we examined the urban-rural welfare gap in Sri Lanka for the years 2002 and 2009/10. This was a period of transition, falling poverty and significant growth for the economy. The data used for the analysis was from the Household Income and Expenditure surveys carried out in 2002 and 2009/10. The study contributes to existing literature in two significant ways. First, the urban-rural gap has not been formally explored for Sri Lanka. Secondly, the paper adds to the existing literature on urban-rural welfare gaps through the application of a new method of unconditional quantile regression introduced by Firpo et al. (2009) used to examine the determinants of per capita expenditure for urban and rural households across the distribution of expenditure[18]. Using this method allowed the contributions of individual factors to the overall urban-rural expenditure gap across the distribution to be isolated. In order to do this, a variant of the Blinder-Oaxaca decomposition was applied directly to the results obtained from the unconditional quantile regression technique.

The focus on the entire expenditure distribution instead of looking at the mean was beneficial since the pattern of the gap was not flat across the distribution. The entire distribution was analysed through a quantile regression technique. Across the distribution, the urban-rural welfare gap increased suggesting that there are larger welfare differences across the two areas for richer households in both years.

After identifying the determinants of per capita expenditure for urban and rural households, we observed that both, urban-rural differences in endowments (for example, years of education) and the returns to those endowments (returns to education) contributed towards urban-rural differences in per capita expenditure. The study found that education levels of urban households, which were quite high in the initial period to begin with, remained fairly similar across the analysed period. In the rural sector however, education levels increased. The differences in education levels contributed to a higher welfare gap for richer households in 2009/10. On the other hand regional differences, which also played an important role in affecting the urban-rural welfare gap, contributed less to the welfare gap for richer households in the latter period.

We also found that remittance flows, both local and foreign, have a positive association with per capita expenditure in urban and rural areas; an exception was seen in 2009/10 where local remittances had no significant link with urban per capita expenditure. However, unlike in the case of Vietnam where the receipt of local remittances narrowed the expenditure gap and foreign remittances widened the gap (Thu Le and Booth, 2014); both, differences in foreign and local

18 To the best of my knowledge, this method has been applied to the urban-rural welfare gap in the case of Vietnam. This is based on a literature search in EconLit.

remittance flows between urban and rural households contributed to a wider welfare gap in the case of Sri Lanka. Other factors that contributed to the expenditure gap include urban-rural differences in ethnicity, household size and age, along with their respective returns.

Between 2002 and 2009/10, the urban-rural welfare gap reduced greatly at every point in the expenditure distribution. Several factors contributed towards this. Differences in certain *endowments* across urban and rural areas reduced during the period. These included regional differences, differences in education levels, job type (wage and self-employment) and job sector (agriculture, manufacturing and services), and differences in demographic characteristics such as household size and the number of children. Differences in *returns* to endowments also narrowed in the latter period. Ethnic differences in returns were no longer significant contributors towards the welfare gap. The differences in returns to education had halved across the distribution by 2009/10; indicating that smaller differences in returns to education contributed towards the overall urban-rural gap in welfare. Another finding in the paper was that the differences in returns by type of employment (wage and self-employment) were significant in affecting the large urban-rural welfare gap in 2002, but had no significant impact on the gap in 2009/10 for richer households.

Such findings are in line with two important advances in Sri Lanka seen in recent years – industrialization and the government's focus on rural development. The literature indicates that as the country became industrialized, more people started moving away from agriculture to manufacturing and services. This was seen by the rising contribution of services to GDP in recent years and the high returns to working in services and manufacturing. Our results on the decomposition of the wage gap suggested that, in addition to convergence of the composition of the workforce across urban and rural households between 2002 and 2009/10, the differences in sectoral returns (agriculture, manufacturing and services) across urban and rural areas contributed to a large fall in the welfare gap in the latter year.

By 2009/10, the war had ended and the country prioritized rural development. Infrastructure developments meant that people were able to easily travel to towns for employment. This rural-urban migration in the former years followed up by the end of a 30-year war opening up new opportunities across the country are consistent arguments with the findings of this study where the urban-rural expenditure gap became smaller. During the analysed period, the country's industrialization has been favourable towards rural areas. However, the fact remains that agriculture still gives the lowest returns in employment. Although the significance of this industry has reduced in recent years, it still remains important to a large proportion of rural households. Therefore, if the Sri Lankan government focusses on poverty alleviation and reducing the urban-rural gap, our findings

suggest that support to poor rural households that will help them improve agricultural productivity or move into other sectors such as services might be helpful.

We identify certain limitations with the study. Firstly, education and potentially other control variables such as occupation type are endogenous. As this analysis was carried out at the household-level, the individual-level instruments used previously are not appropriate. However as we include household characteristics in this study, we hope that this helps reduce part of the bias caused by disregarding unobservables (for example, by accounting for family background effects directly in the model). As we observed the OLS estimates to be downward biased at the individual level in the previous paper, we expect the effect of education on the welfare gap to be under-estimated. The second limitation is the lack of information on internal migration and road infrastructure in the HIE surveys. The Institute for Policy Studies (2013) reported that the urban population has remained fairly stable over the years at around 20 per cent. However to the extent that migration took place, it might be a possible explanation for the narrowing of the welfare gap over time. Infrastructure projects may have also contributed to the welfare gap, making it easier for individuals/produce to be moved across urban and rural areas. Further research to explore the improvements in road infrastructure, migration and movements over time will be useful to uncover these uncertainties. Finally, we note that the end of the war may have had an effect on our results due to the displacement of people in war-affected areas of the country. However, there is no available information on displacement.

Despite the above limitations, this paper adds to the literature through the examination of the urban-rural welfare gap in Sri Lanka during a period of high growth and falling poverty.

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Appendix 1: Data on the excluded districts

Five districts were excluded from the analysis as they were not included in the HIES held in 2002 due to the ongoing war. These include Jaffna, Vavuniya, Batticaloa, Ampara and Trincomalee. In order to compare the characteristics of these five districts to those included in the analysis, we explore the within-quintile means for urban and rural households in the excluded districts. The descriptive statistics are presented in Table A1. Some of the key differences are discussed as follows. On average, households in the excluded districts have lower real expenditure per capita at every quantile in comparison to the rest of the country. This is especially true at higher quantiles where large differences in per capita expenditure are observed. The household size in these five districts is smaller, while the proportion of children are higher, compared to the other districts included in the analysis. Adult non-students in these five districts are on average,

younger, have lower levels of education, predominantly from a Tamil ethnic background and have not received any form of remittance income. At lower quantiles in urban areas, there are more employed adults in agricultural activities and less in service-related activities compared to the rest of the country – such differences are not present at higher quantiles. In rural areas, the proportion of employed adults in agricultural activities is higher while the proportion of adults in manufacturing and service-related activities is lower, compared to the rest of the country.

Table A1: Within-Quintile Means of Key Variables by log RPCE for urban and rural households in 2009/10 (excluded districts)

2009/10	Urban (1,081 households)					Rural (1,695 households)				
Variable	**1st**	**2nd**	**3rd**	**4th**	**5th**	**1st**	**2nd**	**3rd**	**4th**	**5th**
RPCE (at 2002 prices)	1648	2359	2962	4018	8070	1345	1945	2406	3020	4873
Household size	5.29	4.73	4.59	3.85	3.49	5.26	4.69	4.27	3.98	3.34
Children (proportion)	0.24	0.22	0.22	0.16	0.13	0.27	0.25	0.20	0.18	0.17
Average age	30	31	32	36	40	29	31	33	35	35
Education	4.98	5.90	6.68	7.31	8.74	4.18	4.93	5.31	6.20	6.66
Women (prop.)	0.55	0.55	0.55	0.55	0.55	0.54	0.54	0.52	0.53	0.55
Sinhalese (prop.)	0.02	0.04	0.05	0.06	0.10	0.14	0.12	0.15	0.17	0.18
Local remit (0,1)	0	0	0	0	0	0	0	0	0	0
Foreign remit (0,1)	0	0	0	0	0	0	0	0	0	0
Wage (prop.)	0.20	0.21	0.22	0.23	0.31	0.22	0.22	0.23	0.23	0.25
Self-employed (prop.)	0.07	0.10	0.10	0.13	0.14	0.09	0.10	0.12	0.13	0.14
Not employed (prop.)	0.73	0.69	0.68	0.64	0.55	0.69	0.68	0.65	0.64	0.61
Of the employed:										
Agriculture (prop.)	0.27	0.23	0.18	0.22	0.06	0.63	0.47	0.58	0.40	0.33
Manufacture (prop.)	0.30	0.31	0.26	0.19	0.16	0.19	0.21	0.18	0.15	0.14
Services (prop.)	0.43	0.46	0.56	0.69	0.78	0.28	0.32	0.34	0.45	0.53

The key variable of interest is "real per capita expenditure", calculated in Sri Lankan rupees at 2002 prices (1 USD ≈ 146 LKR). The explanatory variables are computed using adult non-student characteristics. Refer to Table A8 for a detailed explanation of how the variables were constructed. The category of not being in employment is the adult non-students who are unemployed, retired/disabled and stay-at-home parents during the sample period. For the wage and self-employed adults, the sectoral variables capture the proportion of wage/self-employed adults in agriculture, manufacturing or the services sector

Appendix 2

Table A2: District-level Laspeyres price index

District	Price Index		Urban population (%)	
	2002	2009/10	2001	2011
Colombo	1.080	1.071	54.6	77.5
Gampaha	1.060	1.041	14.6	16.3
Kandy	1.020	1.007	12.2	12.1
Galle	1.030	0.993	11.1	12.0
Kalutara	1.070	1.038	10.6	9.2
Puttalama	1.000	1.008	9.2	9.3
Matara	0.980	0.961	8.5	11.8
Matale	0.980	0.985	8.2	14.1
Anuradhapura	0.970	0.980	7.1	5.4
Badulla	0.990	0.990	6.6	8.6
Nuwara-eliya	1.010	1.021	6.1	5.9
Ratnapura	1.020	0.991	5.7	8.9
Hambantota	0.940	0.979	4.1	5.5
Kurunegala	0.950	0.983	2.4	2.0
Kegalle	1.010	1.001	2.2	1.8
Polonnaruwa	0.960	1.001	0	0
Moneragala	0.960	0.974	0	0
Batticaloa		1.065		28.8
Mannar				26.0
Ampara		1.020		23.7
Trincomalee		1.052		22.8
Jaffna		1.075		21.0
Vauniya		1.032		20.7
Mullaitivu				0
Kilinochchi				0

Base for price index: Sri Lanka = 1; the population estimates were obtained from the Census of Population and Housing carried out in 2001 and 2011. The districts were sorted by the proportion of individuals in urban areas in 2001. The Household Income and Expenditure surveys do not disaggregate the districts further to explore urban-rural compositions. The HIES for both years (2002 and 2009/10) were estimated using the census blocks from 2001. The 2011 census has a similar composition, with Colombo being primarily urban and Polonnaruwa and Moneragala being rural. Other districts are fairly similar on the urban-composition scale over the years – exceptions include Matara, Matale, Badulla and Ratnapura which have become more urbanized by 2011. The Northern and Eastern provinces (districts: Mannar, Ampara, Trincomalee, Jaffna, Vavuniya, Mullaitivu and Kilinochchi) were excluded from the census in 2001 due to the war. Therefore, no information on the price index and urban population is available for these areas. By 2009/10, 5 additional districts were included in the survey and by 2011, all districts were included in the census.

Table A3: Quantile regression estimation for the pooled sample at the 25th, 50th and 75th quantiles and the mean

Variables	Q25th		Q50th		Q75th		OLS	
	2002	**2009/10**	**2002**	**2009/10**	**2002**	**2009/10**	**2002**	**2009/10**
Urban (0,1)	0.152***	0.094***	0.230***	0.137***	0.397***	0.196***	0.283***	0.152***
	(12.97)	(8.31)	(16.31)	(11.25)	(17.28)	(11.52)	(25.08)	(15.93)
Personal characteristics (average of non-student adults):								
Female	0.024	0.012	-0.035	-0.037	-0.072*	-0.107***	-0.026	-0.047**
	(1.01)	(0.51)	(-1.35)	(-1.52)	(-1.89)	(-3.35)	(-1.32)	(-2.49)
Sinhalese	-0.070***	0.025	-0.004	0.024*	0.013	-0.023	-0.028**	-0.002
	(-4.38)	(1.63)	(-0.27)	(1.71)	(0.66)	(-1.37)	(-2.25)	(-0.18)
Average age	-0.008***	-0.010***	-0.021***	-0.017***	-0.033***	-0.028***	-0.020***	-0.019***
	(-4.22)	(-5.53)	(-10.00)	(-9.75)	(-11.49)	(-11.98)	(-13.02)	(-13.79)
Average age^2	0.010***	0.010***	0.025***	0.017***	0.042***	0.031***	0.026***	0.020***
	(4.12)	(4.70)	(10.47)	(8.42)	(12.43)	(11.19)	(14.12)	(12.41)
Education	0.067***	0.069***	0.098***	0.088***	0.144***	0.115***	0.105***	0.094***
	(32.99)	(33.62)	(47.15)	(45.48)	(49.30)	(44.95)	(63.00)	(58.65)
Job type (average of non-student adults; default – unemployed/not employed):								
Wage	0.019	0.001	0.031	0.032	0.256***	0.224***	0.145***	0.113***
	(0.79)	(0.04)	(1.22)	(1.32)	(7.03)	(6.85)	(7.31)	(5.80)
Self-employed	0.279***	0.200***	0.270***	0.210***	0.310***	0.245***	0.308***	0.231***
	(9.85)	(7.33)	(8.44)	(7.28)	(6.73)	(6.22)	(12.96)	(10.30)
Job sector (average of non-student adults; default - agriculture):								
Manufacturing	0.053***	0.015	0.057***	-0.029*	-0.060***	-0.089***	0.002	-0.056***
	(2.89)	(0.84)	(3.20)	(-1.79)	(-2.64)	(-4.74)	(0.11)	(-4.44)
Services	0.141***	0.131***	0.191***	0.148***	0.159***	0.134***	0.140***	0.108***
	(9.82)	(9.19)	(13.38)	(11.05)	(8.52)	(8.08)	(12.85)	(10.40)
Other demographic characteristics:								
Children	0.045	0.178***	0.166***	0.222***	0.458***	0.316***	0.250***	0.240***
(proportion)	(1.23)	(5.06)	(4.67)	(6.74)	(9.55)	(7.75)	(9.08)	(9.31)
Household size	-0.370***	-0.382***	-0.462***	-0.444***	-0.522***	-0.499***	-0.449***	-0.444***

(log)	(-30.70)	(-29.86)	(-36.30)	(-36.18)	(-28.04)	(-30.22)	(-44.27)	(-44.42)
Foreign remit	0.172***	0.148***	0.211***	0.217***	0.271***	0.324***	0.226***	0.244***
(0,1)	(7.91)	(7.38)	(8.38)	(10.96)	(6.99)	(11.90)	(11.71)	(15.38)
Local remit	0.072***	0.032	0.138***	0.066***	0.160***	0.074***	0.120***	0.051***
(0,1)	(3.05)	(1.50)	(5.63)	(3.36)	(4.66)	(3.19)	(6.54)	(3.42)
Regions (default – Sabaragamuwa):								
Western	0.234***	0.210***	0.294***	0.248***	0.349***	0.263***	0.258***	0.217***
	(12.40)	(10.34)	(15.81)	(13.36)	(13.93)	(12.11)	(17.91)	(15.02)
Central	0.112***	0.042*	0.107***	0.056***	0.106***	0.101***	0.110***	0.053***
	(5.38)	(1.74)	(5.50)	(2.75)	(4.42)	(4.45)	(7.24)	(3.26)
Southern	0.109***	0.160***	0.124***	0.170***	0.096***	0.167***	0.098***	0.146***
	(4.95)	(7.41)	(5.93)	(8.73)	(3.71)	(7.58)	(6.09)	(9.67)
North West	0.074***	0.071***	0.068***	0.070***	0.044*	0.042*	0.066***	0.042**
	(3.30)	(2.95)	(3.20)	(3.19)	(1.65)	(1.72)	(4.00)	(2.48)
North Central	0.211***	0.144***	0.189***	0.176***	0.123***	0.172***	0.159***	0.140***
	(8.46)	(5.52)	(7.39)	(7.20)	(3.74)	(5.98)	(8.32)	(7.51)
Uva	-0.038	-0.051*	0.033	0.004	0.078***	0.066***	0.039**	-1.10×10^{-4}
	(-1.47)	(-1.78)	(1.45)	(0.18)	(2.77)	(2.61)	(2.15)	(-0.01)
Constant	7.289***	7.588***	7.653***	8.007***	7.929***	8.443***	7.651***	8.072***
	(163.08)	(176.20)	(170.70)	(197.64)	(128.28)	(163.66)	(223.15)	(253.36)
Number of observations	16,920	17,182	16,920	17,182	16,920	17,182	16,920	17,182
R-squared	0.19	0.18	0.29	0.25	0.28	0.24	0.41	0.37

Refer to Table A8 for a detailed explanation of how the variables were constructed; *t* statistics in parentheses; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$; the standard errors are bootstrapped with 500 replications

Table A4: Determinants of per household expenditure per capita at selected quantiles and mean (including interaction terms)

Variables	Q25th		Q50th		Q75th		OLS	
	2002	**2009/10**	**2002**	**2009/10**	**2002**	**2009/10**	**2002**	**2009/10**
Urban (0,1)	0.086	0.111	0.179	0.079	0.317	0.133	0.265***	0.311***
	(0.86)	(1.09)	(1.53)	(0.78)	(1.60)	(0.94)	(2.79)	(3.91)
Personal characteristics (average of non-student adults):								
Female	0.020	-0.016	-0.041	-0.052*	-0.090**	-0.089**	-0.016	-0.041*
	(0.69)	(-0.55)	(-1.37)	(-1.83)	(-2.20)	(-2.47)	(-0.73)	(-1.86)
urban*female	0.021	0.074	0.014	0.054	0.114	-0.045	-0.052	-0.024
	(0.33)	(1.49)	(0.24)	(1.01)	(1.09)	(-0.57)	(-1.02)	(-0.54)
Sinhalese	-0.111***	0.026	-0.050***	0.009	-0.047**	-0.042**	-0.077***	-0.012
	(-5.26)	(1.25)	(-2.66)	(0.51)	(-2.27)	(-2.25)	(-5.24)	(-0.90)
urban*sinhalese	0.131***	0.007	0.159***	0.040	0.162***	0.076**	0.144***	0.036
	(4.39)	(-0.22)	(4.78)	(1.36)	(3.22)	(2.01)	(5.34)	(1.53)
Average age	-0.007***	-0.009***	0.018***	-0.015***	-0.023***	-0.024***	-0.013***	-0.015***
	(-2.95)	(-4.15)	(-7.59)	(-7.52)	(-7.46)	(-9.43)	(7.63)	(-9.31)
urban*age	-0.007*	-0.004	-0.013***	-0.005	-0.052***	-0.011*	-0.035***	-0.015***
	(-1.69)	(-1.05)	(-2.69)	(-1.27)	(-6.38)	(-1.94)	(-8.77)	(-4.71)
Average age^2	0.008***	0.009***	0.022***	0.015***	0.028***	0.027***	0.016***	0.015***
	(2.86)	(3.65)	(7.97)	(6.34)	(7.87)	(8.61)	(8.02)	(8.18)
urban* age^2	0.009*	0.002	0.016***	0.005	0.071***	0.013*	0.048***	0.016***
	(1.88)	(0.53)	(2.79)	(1.15)	(7.48)	(1.87)	(10.18)	(4.35)
Education	0.074***	0.072***	0.099***	0.086***	0.128***	0.105***	0.097***	0.089***
	(31.27)	(28.68)	(42.39)	(37.12)	(39.15)	(35.34)	(52.12)	(46.86)
urban*education	-0.029***	-0.013***	-0.001	0.005	0.069***	0.036***	0.036***	0.018***
	(-6.43)	(-2.98)	(-0.25)	(1.10)	(8.11)	(5.77)	(8.20)	(4.94)

Job type (average of non-student adults; default – unemployed/not employed):								
Wage	0.014	0.035	0.028	0.025	0.186***	0.217***	0.087***	0.109***
	(0.48)	(1.18)	(0.95)	(0.89)	(4.74)	(5.96)	(3.97)	(4.89)
urban*wage	0.045	-0.074	0.005	0.075	0.346***	-0.019	0.282***	0.012
	(0.92)	(-1.43)	(0.08)	(1.31)	(3.13)	(-0.22)	(5.13)	(0.25)
Self-employed	0.287***	0.218***	0.276***	0.206***	0.305***	0.232***	0.294***	0.223***
	(8.78)	(6.71)	(7.64)	(6.17)	(6.21)	(5.30)	(11.38)	(8.82)
urban*Self-employed	-0.090	-0.029	0.002	0.121*	0.293**	0.182*	0.222***	0.129**
	(-1.48)	(-0.51)	(0.02)	(1.77)	(2.03)	(1.73)	(3.20)	(2.27)
Job sector (average of non-student adults; default - agriculture):								
Manufacturing	0.065***	0.018	0.083***	-0.010	-0.035	-0.060***	0.033**	-0.029**
	(3.13)	(0.89)	(4.18)	(-0.58)	(-1.45)	(-3.02)	(2.19)	(-2.09)
urban*manufacturing	-0.099**	-0.074*	-0.155***	-0.137***	-0.129	-0.117**	-0.157***	-0.131***
	(-2.30)	(-1.77)	(-3.00)	(-3.18)	(-1.63)	(-2.04)	(-3.82)	(-4.00)
Services	0.145***	0.137***	0.203***	0.180***	0.204***	0.173***	0.162***	0.131***
	(9.05)	(8.28)	(12.89)	(11.80)	(10.44)	(9.47)	(13.78)	(11.17)
urban*services	-0.092***	-0.081**	-0.105**	-0.177***	-0.199***	-0.138***	-0.107***	-0.107***
	(-2.58)	(-2.38)	(-2.43)	(-4.89)	(-2.89)	(-2.78)	(-3.08)	(-3.86)
Other demographic characteristics:								
Children (proportion)	0.075*	0.202***	0.179***	0.207***	0.400***	0.299***	0.221***	0.237***
	(1.77)	(4.77)	(4.52)	(5.48)	(7.95)	(6.75)	(7.31)	(8.01)
urban*children	-0.102	-0.100	-0.015	0.065	0.359**	0.051	0.203***	-0.004
	(-1.27)	(-1.37)	(-0.17)	(0.83)	(2.51)	(0.48)	(2.84)	(-0.06)
Household size (log)	-0.429***	-0.403***	-0.497***	-0.450***	-0.483***	-0.462***	-0.443***	-0.422***
	(-30.16)	(-26.08)	(-34.17)	(-30.94)	(-23.51)	(-24.50)	(-39.17)	(-36.33)
urban*size	0.277***	0.084***	0.172***	0.042	-0.152***	-0.116***	-0.013	-0.065***
	(11.51)	(3.08)	(5.75)	(1.53)	(-3.08)	(-2.92)	(-0.53)	(-2.86)
Foreign remit (0,1)	0.180***	0.163***	0.184***	0.213***	0.251***	0.307***	0.218***	0.236***
	(6.40)	(6.24)	(5.85)	(8.55)	(5.62)	(9.40)	(9.63)	(12.25)
urban*foreign	-0.054	-0.063	0.072	-0.009	0.048	0.032	0.020	0.005

	(-1.40)	(-1.60)	(1.42)	(-0.22)	(0.54)	(0.55)	(0.46)	(0.14)
Local remit (0,1)	0.064**	0.037	0.124***	0.070***	0.128***	0.076***	0.103***	0.067***
	(2.36)	(1.56)	(4.52)	(3.26)	(3.55)	(3.14)	(5.13)	(4.17)
urban*local	0.047	-0.007	0.073	0.021	0.224**	-0.020	0.120**	-0.095**
	(1.04)	(-0.14)	(1.26)	(-0.39)	(2.24)	(-0.26)	(2.44)	(-2.28)
Regions (default – Sabaragamuwa):								
Western	0.245***	0.228***	0.306***	0.254***	0.372***	0.249***	0.268***	0.221***
	(11.61)	(10.16)	(14.86)	(12.32)	(13.65)	(10.47)	(17.12)	(13.80)
urban*western	-0.151***	-0.009	-0.040	0.043	0.122	0.191***	0.057	0.086**
	(-3.32)	(-0.16)	(-0.67)	(0.80)	(1.41)	(2.77)	(1.26)	(2.04)
Central	0.120***	0.017	0.094***	0.036*	0.071***	0.084***	0.089***	0.039**
	(5.35)	(0.66)	(4.56)	(1.67)	(2.92)	(3.62)	(5.57)	(2.25)
urban*central	-0.135***	0.175***	0.066	0.138**	0.283***	0.147*	0.152***	0.118**
	(-2.65)	(2.69)	(1.02)	(2.20)	(2.95)	(1.83)	(3.03)	(2.42)
Southern	0.128***	0.143***	0.144***	0.155***	0.093***	0.146***	0.109***	0.128***
	(5.32)	(5.95)	(6.40)	(7.25)	(3.52)	(6.30)	(6.39)	(7.80)
urban*southern	-0.180***	0.092	-0.106	0.101*	0.145	0.190***	-0.005	0.130***
	(-3.37)	(1.55)	(-1.61)	(1.79)	(1.49)	(2.65)	(-0.10)	(2.96)
North Western	0.077***	0.054**	0.061***	0.049**	0.025	0.020	-0.056***	0.025
	(3.24)	(2.07)	(2.73)	(2.07)	(0.92)	(0.80)	(-3.27)	(1.41)
urban*north_w	-0.092	0.114*	0.078	0.162**	0.297***	0.251***	0.148**	0.167***
	(-1.58)	(1.68)	(1.06)	(2.48)	(2.59)	(2.99)	(2.57)	(3.22)
North Central	0.228***	0.143***	0.199***	0.172***	0.121***	0.162***	0.165***	0.135***
	(8.49)	(5.09)	(7.35)	(6.63)	(3.57)	(5.41)	(8.30)	(6.83)
urban*north_c	-0.149***	0.031	-0.034	0.056	0.022	0.169	-0.062	0.114*
	(-2.62)	(0.41)	(-0.40)	(0.74)	(0.17)	(1.62)	(-0.91)	(1.87)
Uva	-0.028	-0.072**	0.031	-0.016	0.034	0.040	-0.023	-0.020
	(-1.02)	(-2.39)	(1.31)	(-0.64)	(1.23)	(1.57)	(-1.22)	(-1.02)
urban_uva	-0.090	0.262***	0.025	0.211***	0.393***	0.242**	0.118*	0.215***
	(-1.19)	(3.23)	(0.30)	(2.66)	(3.01)	(2.28)	(1.76)	(3.40)

Constant	7.317***	7.574***	7.678***	8.018***	7.929***	8.418***	7.655***	8.015***
	(143.46)	(150.12)	(153.56)	(173.65)	(121.77)	(148.70)	(204.69)	(221.74)
Number of observations	16,920	17,182	16,920	17,182	16,920	17,182	16,920	17,182
R-squared	0.20	0.19	0.29	0.26	0.29	0.24	0.42	0.37

Refer to Table A8 for a detailed explanation of how the variables were constructed; *t* statistics in parentheses; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$; the standard errors are bootstrapped with 500 replications

Table A5: Determinants of urban household expenditure per capita at the mean and selected quantiles in 2009/10 (all districts)

Variables	Q25th	Q50th	Q75th	OLS
Personal characteristics (average of non-student adults):				
Female	0.005	-0.068	-0.072	-0.067*
	(0.12)	(-1.44)	(-1.23)	(-1.91)
Sinhalese	0.060**	0.063**	0.065**	0.056***
	(2.47)	(2.48)	(2.22)	(2.93)
Average age	-0.016***	-0.020***	-0.030***	-0.024***
	(-5.00)	(-5.65)	(-6.95)	(-9.34)
Average age^2	0.016***	0.022***	0.034***	0.026***
	(4.31)	(5.41)	(6.61)	(8.59)
Education	0.077***	0.098***	0.112***	0.097***
	(20.87)	(25.98)	(24.21)	(32.62)
Job type (average of non-student adults; default – unemployed/not employed):				
Wage	-0.012	0.111**	0.196***	0.086**
	(-0.26)	(2.11)	(2.87)	(2.13)
Self-employed	0.254***	0.330***	0.372***	0.298***
	(4.88)	(5.22)	(4.57)	(6.24)
Job sector (average of non-student adults; default - agriculture):				
Manufacturing	-0.035	-0.011	-0.050	-0.035
	(-0.95)	(-1.00)	(-1.21)	(-1.15)

Services	0.116***	0.141***	0.168***	0.143***
	(3.77)	(3.58)	(4.53)	(4.03)
Other demographic characteristics:				
Children (proportion)	0.201***	0.217***	0.299***	0.200***
	(3.08)	(3.69)	(3.96)	(4.10)
Household size (log)	-0.435***	-0.486***	-0.475***	-0.474***
	(-19.31)	(-20.55)	(-16.07)	(-25.73)
Foreign remit (0,1)	0.226***	0.270***	0.246***	0.259***
	(6.86)	(7.24)	(5.22)	(8.93)
Local remit (0,1)	0.069	0.016	-0.089	-0.021
	(1.34)	(0.27)	(-1.38)	(-0.52)
Regions (default – Sabaragamuwa):				
Western	0.277***	0.295***	0.368***	0.304***
	(4.82)	(5.60)	(6.25)	(7.39)
Central	0.204***	0.143**	0.193***	0.167***
	(3.10)	(2.28)	(2.80)	(3.49)
Southern	0.278***	0.231***	0.302***	0.262***
	(4.70)	(4.18)	(4.87)	(6.13)
Northern	0.250***	0.162**	0.230***	0.224***
	(3.52)	(2.37)	(3.02)	(4.39)
Eastern	0.169**	0.045	0.151**	0.132***
	(2.60)	(0.78)	(2.36)	(2.88)
North West	0.216***	0.197***	0.200***	0.203***
	(3.13)	(3.05)	(2.75)	(3.96)
North Central	0.166**	0.208***	0.327***	0.247***
	(2.11)	(2.69)	(3.43)	(4.08)
Uva	0.174**	0.184**	0.172*	0.199***
	(2.06)	(2.22)	(1.89)	(3.14)
Constant	7.742***	8.132***	8.522***	8.240***
	(84.70)	(88.75)	(78.48)	(119.85)

Number of observations	5,273	5,273	5,273	5,273
R-squared	0.19	0.26	0.23	0.36

Refer to Table A8 for a detailed explanation of how the variables were constructed; *t* statistics in parentheses; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$; the standard errors are bootstrapped with 500 replications.

Table A6: Determinants of rural household expenditure per capita at the mean and selected quantiles in 2009/10 (all districts)

Variables	Q25th	Q50th	Q75th	OLS
Personal characteristics (average of non-student adults):				
Female	-0.024	-0.024	-0.075**	-0.043**
	(-0.97)	(-0.99)	(-2.34)	(-2.22)
Sinhalese	0.013	-0.016	-0.002	0.004
	(0.75)	(-1.03)	(-0.12)	(0.35)
Average age	-0.004**	-0.013***	-0.022***	-0.013***
	(-2.38)	(-7.21)	(-9.44)	(-9.16)
Average age^2	0.003	0.012***	0.024***	0.013***
	(1.60)	(5.84)	(8.55)	(7.77)
Education	0.060***	0.077***	0.101***	0.084***
	(28.58)	(38.25)	(38.15)	(49.53)
Job type (average of non-student adults; default – unemployed/not employed):				
Wage	0.014	0.017	0.146***	0.092***
	(0.54)	(0.69)	(4.38)	(4.50)
Self-employed	0.159***	0.175***	0.224***	0.201***
	(5.86)	(6.10)	(5.65)	(8.77)
Job sector (average of non-student adults; default - agriculture):				
Manufacturing	0.010	-0.001	-0.060***	-0.033**
	(0.57)	(-0.08)	(-3.23)	(-2.60)

Services	0.108***	0.156***	0.174***	0.123***
	(7.81)	(11.75)	(10.37)	(11.75)
Other demographic characteristics:				
Children (proportion)	0.148***	0.169***	0.272***	0.216***
	(4.15)	(5.14)	(6.70)	(8.13)
Household size (log)	-0.360***	-0.422***	-0.475***	-0.420***
	(-27.81)	(-33.93)	(-28.50)	(-40.45)
Foreign remit (0,1)	0.135***	0.197***	0.288***	0.234***
	(5.86)	(8.56)	(9.16)	(12.69)
Local remit (0,1)	0.027	0.052***	0.065***	0.062***
	(1.24)	(2.67)	(2.80)	(4.05)
Regions (default – Sabaragamuwa):				
Western	0.184***	0.224***	0.293***	0.225***
	(9.29)	(11.64)	(12.30)	(14.72)
Central	0.008	0.027	0.087***	0.040**
	(0.36)	(1.29)	(3.63)	(2.36)
Southern	0.112***	0.142***	0.154***	0.126***
	(5.24)	(7.02)	(6.50)	(7.98)
Northern	0.064	-0.004	-0.046	0.006
	(1.57)	(-0.11)	(-1.10)	(0.19)
Eastern	0.048*	0.012	-0.007	0.008
	(1.77)	(0.52)	(-0.28)	(0.41)
North West	0.049**	0.045**	0.032	0.025
	(2.09)	(2.05)	(1.21)	(1.45)
North Central	0.122***	0.154***	0.176***	0.134***
	(4.92)	(6.36)	(5.81)	(7.05)
Uva	-0.058**	-0.022	0.018	-0.024
	(-2.11)	(-0.93)	(0.69)	(-1.26)
Constant	7.610***	8.021***	8.396***	8.025***
	(176.15)	(195.90)	(160.60)	(243.54)

Number of observations	14,685	14,685	14,685	14,685
R-squared	0.16	0.23	0.22	0.34

Refer to Table A8 for a detailed explanation of how the variables were constructed; *t* statistics in parentheses; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$; the standard errors are bootstrapped with 500 replications

Table A7: Contributions to the urban-rural expenditure gap at the mean and selected quantiles in 2009/10 (all districts)

	Q25th	**Q50th**	**Q75th**	**OLS**
Predicted Gap	**0.224*** **	**0.261*** **	**0.314*** **	**0.271*** **
$[\hat{Y}_u - \hat{Y}_r]$	**(19.46)**	**(21.09)**	**(21.78)**	**(26.86)**
Due to endowments $[(\hat{X}_u - \hat{X}_r)\hat{\beta}_r]$**:**				
Female	-4.58x10^{-4}	-4.56x10^{-4}	-0.001**	-0.001**
	(-0.94)	(-0.96)	(-2.14)	(-2.04)
Sinhalese	-0.002	-0.003	3.28x10^{-4}	-0.001
	(-0.75)	(-1.03)	(0.12)	(-0.35)
Age	-0.001**	-0.004***	-0.005***	-0.004***
	(-2.54)	(-3.48)	(-3.19)	(-3.51)
Education	0.061***	0.079***	0.104***	0.086***
	(16.82)	(18.27)	(18.26)	(19.18)
Job Type	-0.007***	-0.008***	-0.009***	-0.009***
	(-5.47)	(-5.65)	(-5.13)	(-7.45)
Job Sector	0.021***	0.030***	0.033***	0.023***
	(7.23)	(10.34)	(8.93)	(9.95)
Demographics	-0.014***	-0.017***	-0.019***	-0.017***
	(-5.57)	(-5.60)	(-5.72)	(-5.73)
Remittances	0.002*	0.003**	0.004**	0.003**

	(1.82)	(1.99)	(2.42)	(2.41)
Region	0.033***	0.032***	0.036***	0.034***
	(9.40)	(8.82)	(7.78)	(11.12)
Total	**0.092*** **	**0.113*** **	**0.142*** **	**0.116*** **
	(14.01)	**(15.90)**	**(16.23)**	**(17.32)**
Due to coefficients $[(\widehat{\boldsymbol{\beta}}_{\boldsymbol{u}} - \widehat{\boldsymbol{\beta}}_{\boldsymbol{r}})\widehat{\boldsymbol{X}}_{\boldsymbol{r}}]$**:**				
Female	0.015	-0.023	0.002	-0.012
	(0.59)	(-0.83)	(0.05)	(-0.59)
Sinhalese	0.034	0.033	0.048**	0.037**
	(1.60)	(1.58)	(1.99)	(2.28)
Age	-0.207***	-0.087	-0.108	-0.169***
	(-3.28)	(-1.32)	(-1.38)	(-3.48)
Education	0.113***	0.130***	0.070**	0.082***
	(4.17)	(4.75)	(2.05)	(3.75)
Job Type	0.008	0.048**	0.036	0.013
	(0.39)	(2.09)	(1.20)	(0.76)
Job Sector	-0.006	-0.059***	-0.081***	-0.033**
	(-0.31)	(-3.27)	(-3.94)	(-2.43)
Demographics	-0.093**	-0.073*	0.004	-0.076**
	(-2.60)	(-1.90)	(0.08)	(-2.59)
Remittances	0.008	0.001	-0.014**	-0.005
	(1.64)	(0.20)	(-2.25)	(-1.32)
Region	0.129**	0.089*	0.118**	0.119***
	(2.39)	(1.81)	(2.16)	(3.08)
Constant	0.132	0.110	0.126	0.214***
	(1.30)	(1.10)	(1.04)	(2.81)
Total	**0.133*** **	**0.170*** **	**0.201*** **	**0.170*** **
	(8.33)	**(10.86)**	**(11.30)**	**(14.41)**
Interaction $[(\widehat{\boldsymbol{X}}_{\boldsymbol{u}} - \widehat{\boldsymbol{X}}_{\boldsymbol{r}})(\widehat{\boldsymbol{\beta}}_{\boldsymbol{u}} - \widehat{\boldsymbol{\beta}}_{\boldsymbol{r}})]$**:**				
Female	$-5.59\text{x}10^{-4}$	-0.001	$6.03\text{x}10^{-5}$	$-4.56\text{x}10^{-4}$

	(0.58)	(-0.80)	(0.05)	(-0.58)
Sinhalese	-0.008	-0.007	-0.011*	-0.008**
	(-1.60)	(-1.58)	(-1.90)	(-2.27)
Age	-0.004**	-0.001	-0.001	-0.002**
	(-2.28)	(-0.52)	(-0.79)	(-2.03)
Education	0.018***	0.021***	0.011**	0.013***
	(4.08)	(4.63)	(2.04)	(3.69)
Job Type	-0.004*	-0.006**	-0.006	-0.004*
	(-1.68)	(-2.17)	(-1.60)	(-1.84)
Job Sector	$8.27x10^{-4}$	-0.020***	-0.030***	-0.011**
	(0.12)	(-3.01)	(-3.87)	(-2.19)
Demographics	-0.003**	-0.003**	$-1.10x10^{-4}$	-0.002**
	(-2.54)	(-2.24)	(-0.08)	(-2.09)
Remittances	$4.29x10^{-4}$	0.003	0.005*	0.004**
	(0.17)	(1.16)	(1.72)	(2.06)
Region	-0.003	-0.007	0.002	-0.004
	(-0.32)	(-0.86)	(0.25)	(-0.68)
Total	**$-4.45x10^{-4}$**	**-0.021***	**-0.029****	**-0.015**
	(-0.04)	**(-1.73)**	**(-1.99)**	**(-1.61)**
Number of observations	19,958	19,958	19,958	19,958

The decomposition was estimated from the viewpoint of rural households. Base categories: Male (gender), non-Sinhalese (ethnic background), not employed (job type), agriculture (job sector), Sabaragamuwa (region) *z* values in parentheses; Demographic characteristics include household size (log) and the number of children; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$; the standard errors are bootstrapped with 500 replications

Table A8: Variables used for the main analysis: HIES 2002 and 2009/10

Variable	Description	Number of observations	Mean	Minimum	Maximum	Standard deviation
HIES 2002						
real per capita expenditure	monthly per capita expenditure by the household	16,920	3,284	274	108,633	3,925
household size	number of persons in the household	16,920	4.36	1	19	1.77
proportion of children (age<15)	the proportion of children in the household below the age of 15	16,920	0.19	0	0.83	0.20
urban	urban=1 if the household is located in an urban area, else zero (rural)	16,920	0.19	0	1	0.39
local remittance	=1 if household receives remittance income within the country, else zero	16,920	0.05	0	1	0.22
foreign remittance	=1 if household receives remittance income from abroad, else zero	16,920	0.05	0	1	0.21
Characteristics of adult non-students in the household:						
education (years)	average years of education for adult non-students	16,920	6.63	0	19	3.06
age	average age for adult non-students	16,920	34.68	15	65	13.42
female	proportion of female adult non-students	16,920	0.50	0	1	0.21
Sinhalese	proportion of Sinhalese adult non-students	16,920	0.81	0	1	0.36
primary industry	proportion of adults working in primary industries	16,920	0.29	0	1	0.42
secondary industry	proportion of adults working in secondary industry	16,920	0.18	0	1	0.35
tertiary industry	proportion of adults working in tertiary industries	16,920	0.44	0	1	0.46
wage employment	proportion of adults working in wage employment	16,920	0.29	0	1	0.27
self-employment	proportion of adults working in self-employment	16,920	0.14	0	1	0.21
unemployed/not employed	proportion of adults who are unemployed/not employed	16,920	0.57	0	1	0.26

HIES 2009/10						
real per capita expenditure	monthly per capita expenditure by the household (at 2002 prices)	17,182	4,090	396	347,855	5,652
household size	number of persons in the household	17,182	4.27	1	17	1.73
proportion of children (age<13)	the proportion of children in the household below the age of 15	17,182	0.17	0	0.75	0.19
urban	urban=1 if the household is located in an urban area, else zero (rural)	17,182	0.24	0	1	0.43
local remittance	=1 if household receives remittance income within the country, else zero	17,182	0.08	0	1	0.26
foreign remittance	=1 if household receives remittance income from abroad, else zero	17,182	0.07	0	1	0.25
Characteristics of adult non-students in the household:						
education (years)	average years of education for adult non-students	17,182	6.80	0	19	3.08
age	average age for adult non-students	17,182	36.21	15	65	14.67
female	proportion of women adult non-students	17,182	0.52	0	1	0.21
Sinhalese	proportion of Sinhalese adult non-students	17,182	0.75	0	1	0.39
primary industry	proportion of adults working in primary industries	17,182	0.26	0	1	0.41
secondary industry	proportion of adults working in secondary industries	17,182	0.20	0	1	0.36
tertiary industry	proportion of adults working in tertiary industries	17,182	0.43	0	1	0.46
wage employment	proportion of adults working in wage employment	17,182	0.26	0	1	0.27
self-employment	proportion of adults working in self-employment	17,182	0.15	0	1	0.21
unemployed/not employed	proportion of adults who are unemployed/not employed	17,182	0.59	0	1	0.26