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Female Labour Force Participation and Economic Development in Labour Abundant Countries: Evidence from Sri Lanka

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Female Labour Force Participation and Economic Development in Labour Abundant Countries: Evidence from Sri Lanka *

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Abstract

Female labour force participation remains low across much of the developing world despite robust economic growth and structural change. Cross-country studies provide contradictory conclusions, while there is little analysis at the country and regional levels. This paper examines the microeconomic determinants of female participation using rich household survey data from Sri Lanka, where participation is low for its level of economic development. It finds household income, secondary education and fertility to lower participation rates. Participation has increased with economic growth, and a decomposition analysis reveals rising education, falling fertility, and weakening income effects to be the main contributors. However, growth has been concentrated in low-skill sectors, in line with comparative advantage, reducing employment prospects for the burgeoning supply of educated women. This is consistent with studies from other emerging markets suggesting it is the nature, not speed, of economic growth that matters for women's labour force activity.

Key words: women, labour force participation, economic development, human capital

*The empirical analysis in this paper was conducted with household survey data collected by the Department of Census and Statistics, Government of Sri Lanka. All errors are my own.

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1 Introduction

In recent years, women's participation in the labour market has been receiving greater attention in the literature. Pioneering studies by Ester Boserup and Claudia Goldin sought to understand women's labour market status in the context of economic development (Boserup, 1970; Goldin, 1995). They hypothesized that the initial transition from agrarian to industrial societies reduces job opportunities for women, prompting their withdrawal from economic activity. Further economic development reverses this trend as female education catches up to men's, fertility declines, jobs become available for women in modern sectors, and social norms evolve towards greater acceptance of women in paid employment. According to their hypothesis, the long-term relationship between female labour force participation and economic growth takes a U shape.

In line with this theory, advanced industrialized countries have experienced a gradual increase in female labour force participation over the last several decades, and their participation rates are now among the highest in the world (OECD, 2017; ILO, 2017). Among emerging economies, however, patterns have been much more varied. In China, female participation rates have fallen rapidly since the early 1990s from their previously high levels, especially among urban women (Hare, 2016). In India, too, participation has steadily declined since the early 1980s, while remaining low and stagnant in Pakistan, the Middle East and North Africa for several decades (Ejaz, 2007; Verme et al., 2016; Lahoti and Swaminathan, 2016). In contrast, participation has steadily risen in Bangladesh (Husain, 2016), South Korea (Lee et al., 2008), Sri Lanka (LFS, 2017) and Taiwan (Cheng and Loichinger, 2017). In Latin America, participation has increased across the board, but remains low in Chile, Mexico and Nicaragua compared to the rest of the region (Contreras and Plaza, 2010).

These inconsistencies are a puzzle given these countries' recent shared experiences with structural transition. In the latter part of the 20th century, several developing countries implemented large-scale economic reforms in the form of liberalisation, privatisation and macroeconomic stabilisation, and have become much more integrated with the rest of the world. Ensuing economic growth was accompanied by massive structural change, including plummeting fertility rates, large gains in female education, and a growing share of services in gross domestic product (GDP) (World Bank, 2017). According to the U-shape hypothesis, these changes should have had a predictable impact on female participation. At the same time, however, the U-shape hypothesis was developed by observing groups of countries at a given point in the time, rather than a single country over a long period of time. Cross-sectional analyses of this type may mask important information at the micro level. Indeed, a small but growing body of country-specific studies of emerging markets has revealed a host of factors at the household, local and national levels that influence women's labour market outcomes: these include marriage and household composition, local labour demand conditions, geographic mobility, cultural norms, and institutional arrangements governing employment and childcare.

This paper contributes to the micro-level literature by analyzing the determinants and trends of female labour force participation in Sri Lanka over the period 1992-2014. The study is important for several reasons. First, Sri Lanka and its South Asian neighbors implemented broad economic reforms in the early 1990s, bringing rapid economic growth and structural change to the region. Yet, female participation has steadily risen in Sri Lanka and Bangladesh, while remaining low and stagnant in India and Pakistan. Examining the factors driving these trends will help policymakers appropriately target those groups marginalised from the development process. Studies show greater female employment generates productivity growth (World Bank, 2012), increases women's bargaining power, and improves children's health and education (Lundberg et al., 1997; Qian, 2008; Luke and Munshi, 2011; Majlesi, 2016), thereby setting the stage for future growth. Yet, this topic has received little attention in the South Asian context.

Second, Sri Lankan women participate in the labour market at rates much lower than predicted by the U-shape hypothesis, similar to their counterparts in several other emerging markets in Asia and Latin America. This indicates broad development measures, such as income and education, fall short of explaining aggregate participation rates, affirming the need for micro-level analysis. Third, population ageing is projected to

contract Sri Lanka's labour force after 2030, with harmful consequences for economic growth and the welfare state (Vodopivec and Arunatilake, 2011). Increasing women's employment mitigates these problems (Euwals et al., 2011), but requires a thorough understanding of what draws women into (and keeps them out of) the workforce.

This paper first estimates a binary choice model of labour force participation for women using data from the Sri Lanka Labour Force Survey (LFS). The analysis focuses on married women age 25-65 in order to avoid confusing education, marriage and retirement choices with participation decisions. The estimation results show that women's participation decisions in Sri Lanka are in line with economic theory, with the expected signs on the coefficients for age, household income and children. A notable finding is that participation declines from primary to secondary schooling, and then jumps to very high levels at tertiary education. This pattern has been documented in other emerging economies and is key to understanding low participation rates among married women.

The estimated model is used to decompose the growth in the female participation rate over the period 1992-2014. The results show rising tertiary education and falling fertility have both had a positive impact on participation. An important finding is that participation has become less sensitive to household income and age. Further analysis reveals this change was driven by less educated women among younger generations, and is linked to robust wage growth and growing job opportunities for low-skill women in the manufacturing, trade, transport and communication sectors. This is consistent with the expansion of labour-intensive sectors and falling unemployment in the aftermath of liberalisation (Athukorala and Rajapatirana, 2000). The behavior of high-skill women has shifted in the opposite direction: they have become more (negatively) responsive to household income and children, and less (positively) responsive to higher education, signaling an overall retreat from labour force activity. A likely explanation is the slow growth in high-skill jobs, which has created a skills mismatch for the highly educated.

To the best of the author's knowledge, this paper is the first to analyze the microeconomic determinants of changes in Sri Lanka's female labour force participation.[1] The rest of the paper is organised as follows: Section 2 discusses the literature on female labour force participation and economic development. Section 3 describes trends in labour supply, employment, education, and wages in Sri Lanka . Section 4 presents the empirical model of female labour supply and the estimation results. Section 5 presents the decomposition analysis, and probes further into the sources driving changes in labour supply behavior. Section 6 concludes.

2 Women's Work and Economic Development

The literature has taken two approaches to the study of female labour force participation. The first examines the 'long-run' determinants of female participation in the context of economic development (Boserup, 1970; Goldin, 1995; Mammen and Paxson, 2000). In the initial stages of development, industrialisation increases wages and job opportunities for men relative to women. Consequently, the income effect dominates the substitution effect, prompting a decline in female labour supply. More than likely, women also face fixed costs to supplying labour. These include societal norms discouraging married women from paid employment in factories, and the cost of combining modern work schedules with domestic responsibilities. As development proceeds further, the gender-education gap closes while the emerging service sector opens up socially acceptable white-collar jobs for women. The (positive) substitution elasticity of women's own wages starts to overcome the (negative) income elasticity of their husbands' wages, and female labour supply rises once again. This summarizes the 'feminisation U' theory.

This is a long-run theory of female participation in a given country over the entire course of its economic development. In the absence of such detailed information, empirical tests of the theory have relied on cross-sectional data for countries observed over a short time horizon. Several such studies confirm the U shape (Goldin, 1995; Mammen and Paxson, 2000; Luci, 2009; Lundberg, 2010; Tam, 2011), but some recent

papers have challenged its existence. Gaddis and Klasen (2014) show that the presence of a U shape depends on the data sources used, and that the U vanishes altogether under dynamic panel estimation. They conclude that cross-country differences in female participation has more to do with historical contingencies than level of GDP. Olivetti (2014) confirms the U shape for the group of now advanced countries observed over the period 1890-2005, but finds no such evidence for the group of non-OECD countries observed since 1950. She concludes that the presence of the U depends on the type of structural transformation, arguing that industrialization in the late 20th century was more brain intensive and female friendly compared to that experienced by advanced countries a century before. For example, Asia emphasised 'light manufacturing' industries such as electronics and garments, while former socialist countries actively recruited women into blue-collar labour during their industrialization phase. India favored services over manufacturing as the engine of growth. Thus, even when the empirical U shape holds, there is enormous variation in participation rates for a given level of GDP per capita (Figure A.1 in the Appendix).

The inconsistency of the feminisation U theory with the actual experiences of many developing countries emphasises the need to understand women's labour supply decisions from a wider set of microeconomic variables, rather than from aggregate data. This leads us to the second approach in the literature, which focuses on country-specific analyses using household surveys and population censuses. Most studies of this genre come from advanced countries and are not directly concerned with issues of development. Nevertheless, they have established several factors that consistently predict female participation, namely marriage, fertility, wages, and household income (Mincer, 1962; Juhn and Murphy, 1997; Blau and Kahn, 2007; Heim, 2007; Bradbury and Katz, 2008). That these same factors also appear in the small but growing body of work on developing countries suggests a universal set of predictors for women's labour supply exists. However, there appears to be additional factors unique to today's emerging economies.

A key finding is that education fails to increase female participation in a number of developing countries. In fact, the transition from primary to secondary schooling *decreases* participation in India (Olsen and Mehta, 2006; Klasen and Pieters, 2015), Mexico (Garduno-Rivera, 2013), Morocco (Verme et al., 2016), and Sri Lanka (Gunatilaka, 2013), with participation rising again only at tertiary education. Education has a negative participation effect on married women in Korea (Lee et al., 2008) and on rural married women in China (Chen et al., 2014). In Jordan, secondary schooling has no effect on female participation, while tertiary education has a positive effect (Chamlou et al., 2011). Researchers attribute these patterns to social stigmas associated with female labour. When gender norms dictate men be breadwinners, a woman in paid low-skill work can only imply economic distress, which sends a negative signal about her husband's ability to provide (Goldin, 1995). This stigma increases when a woman becomes more educated and thereby gains social status, raising her utility cost of engaging in low-skill work and prompting labour force withdrawal (Olsen and Mehta, 2006; Klasen and Pieters, 2015). The utility cost vanishes for highly educated women because they can access socially acceptable, 'feminised' white-collar jobs in teaching, nursing and public administration (Boserup, 1970). Note that the stigma argument is usually not applied to single women, who are often observed working in low-skill manufacturing jobs. This paper too finds a negative participation effect of secondary education, but only for married women, and shows that it is clearly linked to strict occupational segregation by education level.

Another important finding from country-specific studies is that GDP matters less than economic and social structures in determining women's labour market outcomes. Klasen and Pieters (2015) find that India's robust economic growth post-liberalisation has been concentrated in male-dominated industries such as construction and low-skill services (e.g. transport, wholesale trade). This alone served to decrease participation rates among urban married women. Lahoti and Swaminathan (2016) argue that growth in India has been led by service industries requiring skills most Indian women do not possess. Examining the decline in female participation in Morocco, Verme et al. (2016) find that economic growth occurred largely in male-dominated sectors favoring uneducated labour. This reduced the employment prospects of secondary educated women, who, unlike university graduates, do not enjoy privileged access public sector jobs. For

China, Hare (2016) argues that falling relative wages for low-skill women have prompted their withdrawal from the labour force, causing the steep decline in participation observed among urban married women. For South Korea, Lee et al. (2008) find that a higher concentration of private sector jobs and large firms in a city corresponds to lower participation rates for married women. They cite this as evidence of discriminatory practices by large, private firms against married women. Contreras and Plaza (2010) and Chamlou et al. (2011) are able to directly link low female participation rates to gender-base cultural norms in Chile and Jordan, respectively.

3 Women's Labour Supply in Sri Lanka

The analysis uses data for the period 1992-2014 from the Sri Lanka Labour Force Survey (LFS), a cross-sectional survey of households conducted every quarter by the Sri Lankan government. The LFS is the source of official labour force statistics released by the Sri Lanka government and by international institutions like the World Bank and the International Labour Organization. Table A.1 in the Appendix summarises female population and labour force trends by age group. The labour force share of women age 25-65 increased faster than for other age groups, a consequence of both demographic ageing and rising participation rates. Most women age 25-65 are married and roughly 85 per cent lived with a male household head, implying the vast majority are secondary earners in their households. For these reasons, and to prevent simultaneous education, marriage and retirement decisions from influencing the results[2], the analysis is restricted to married women age 25-65 living with a male household head.

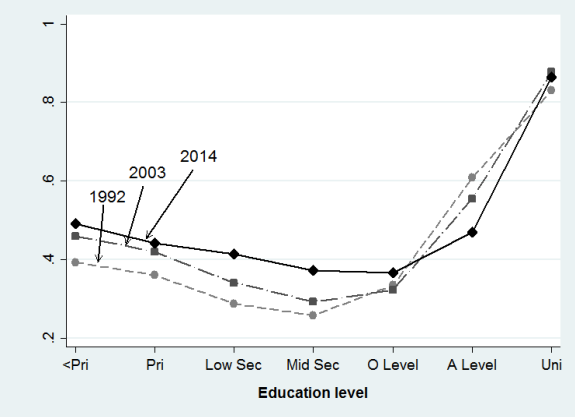
The LFS records labour force activity for the week preceding the survey interview. For this paper, participation is determined from the primary activity in which women engaged during the reference week. Secondary activities are excluded as they involve only 2-3 per cent of individuals. Work activity includes salaried employment, self employment (i.e. employers and 'own-account' workers), unpaid family labour, and being unemployed. A woman engaged in any of the above during the reference week is classified as having participated in the labour force.

Potential concerns about the data should be addressed. First, women's work might be under-reported, especially among self employed and unpaid family workers. This is unlikely to affect year-on-year participation *changes*, however, as the survey questions regarding work activity are identical across all years. Second, temporary work migration to the Middle East could affect the results if, for example, migrants have different work propensities to the rest of the population. The annual cycle of departures and returns could conceivably influence participation levels and trends. The Sri Lanka Bureau of Foreign Employment estimates the number of yearly departures for temporary work at 250,000-290,000 during 2008-2013 for men and women combined (Sri Lanka Bureau of Foreign Employment, 2014). This constitutes just 3 per cent of the labour force in a given year, hardly enough to influence national participation rates. Third, the civil conflict in the Northern and Eastern Provinces, which make up 13 per cent of the country's population, prevented data collection in some years. Table A.1 in the Appendix shows labour force shares and participation rates for 2014 when including and excluding the Northern and Eastern provinces: the differences are negligible. Nevertheless, for the sake of consistency, these two provinces are excluded from the analysis.

Figure 1 plots married women's labour force participation rates for seven education categories ranging from below primary schooling to university degree.[3] Participation decreases with education up to secondary schooling, and increases rapidly thereafter. To shed light on this pattern, Figure 2 plots the industry distribution of married female workers by education level. Educated women (O-level and above) work mainly in the 'white-collar' industries of public administration and professional services (education, finance and health). Their high participation rates may reflect privileged access to those jobs. Also possible is the presence of unmeasurable factors, such as ability and motivation, correlating higher education with high work propensity. Women with low education (middle secondary and below) work predominantly in agriculture,

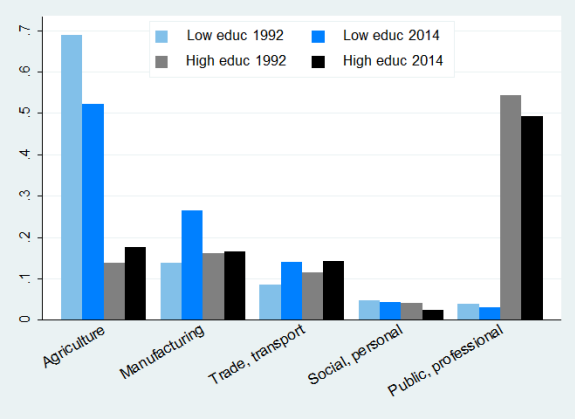
with less than 5 per cent in white-collar industries. This strict occupational segregation by education level could explain the education-participation pattern of Figure 1. Shut out of white-collar jobs, women with intermediate education and commensurate social status may prefer not to work rather than face the stigma of engaging in low-skill labour.

Figure 1: Married Women's Labour Force Participation Rates by Education Level



Notes: Married women age 25-65. *Source*: Sri Lanka Labour Force Survey

Figure 2: Shares of Married Female Workforce by Industry



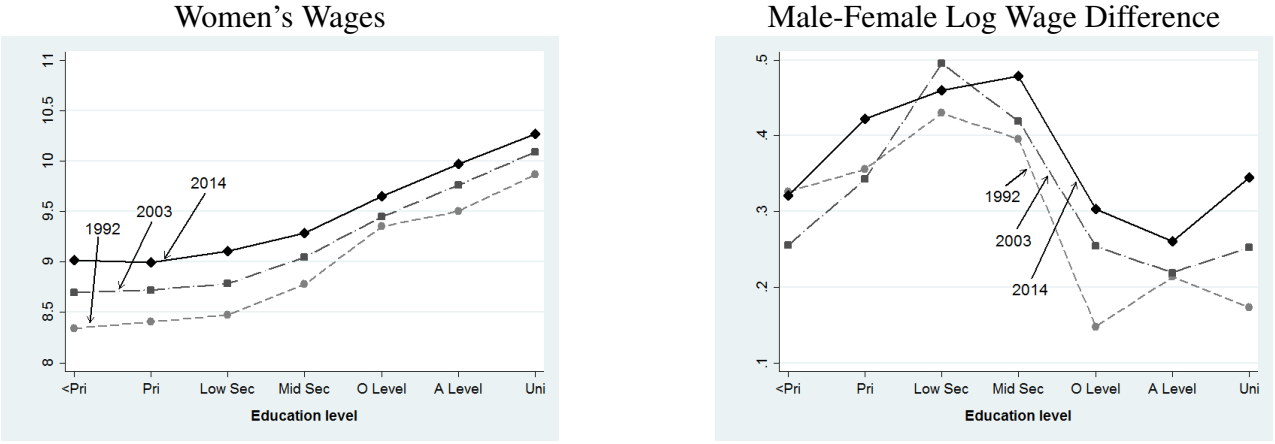
Notes: All married female workers, including salaried employees, the self-employed, and unpaid family workers. *Source*: Sri Lanka Labour Force Survey

The stigma argument is further supported by the absence of the above patterns for single women and for men (not shown). Single women's participation rises monotonically with education, indicating the substitution effect dominates the income effect as wages increase. Single women are also more concentrated in manufacturing and low-skill services than in agriculture. As for men, participation rates hover around 90 per cent at all education levels, while their workforce is much more evenly distributed across industries.

Yet, the constraints on married women's labour seem to have weakened. Far from retreating into the home as agriculture declined, married women with low education entered manufacturing and low-skill services (trade, transport, communication). Their real wages doubled (Figure 3) and they increased participation despite widening gender-wage gaps, consistent with the substitution elasticity of own wages overcom-

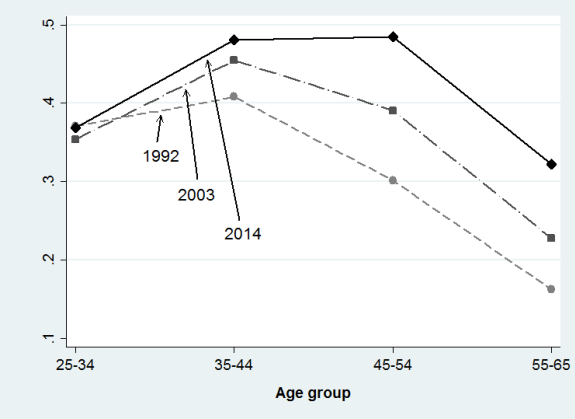
ing the income elasticity of husbands' wages. It appears the expansion of low-skill jobs following liberalisation has allowed married women to overcome social stigmas against low-skill employment. These stigmas themselves may have weakened if jobs in manufacturing, for example, have changed to reflect finer motor skills and individual advancement, rather than necessity and physical exhaustion. This may be tied to the rising participation of older women (Figure 4), who tend to have low education levels. The 1992 age profile shows participation falling steeply after age 45, but, by 2014, older age groups participated at rates quite similar to their younger counterparts. Other possible factors drawing older women into the labour force are shrinking family sizes and rising life expectancies, both of which may prolong working lives in the absence of social safety nets for the elderly (Vodopivec and Arunatilake, 2011).[4]

Figure 3: Women's Real Wages and Gender Wage Gap by Education Level



Notes: Log average monthly real wages of salaried employees age 25-65. Wages are in 2013 rupees, based on the GDP deflator series provided by the Central Bank. (Results are the same when deflated by CPI.) *Source*: Sri Lanka Labour Force Survey

Figure 4: Married Women's Labour Force Participation Rate by Age Group



Notes: Married women age 25-65. *Source*: Sri Lanka Labour Force Survey

As liberalisation boosted low-skill sectors in Sri Lanka, trends have been less promising for educated women. White-collar jobs (public administration and professional services) grew relatively slowly (from

12.9 to 17.1 per cent of total employment) compared to the share of A-level and university graduates in the working-age population (from 6.5 to 16.2 per cent). Not surprisingly, an educated woman's probability of working in a white-collar job declined, although no such change occurred for educated men. As Boserup observes, competition for scarce white-collar jobs in developing countries tends to favor men (Boserup, 1970). This helps explain why the gender-wage gap rose fastest among educated workers. Limited job opportunities and growing relative male incomes are synonymous with large income effects, which explains the falling and stagnant participation rates of educated women (see Figure 1).

Another potential downside of liberalisation is the growing prevalence of self employment in Sri Lanka, with less educated men and women disproportionately affected (Figure A.2 in the Appendix). This may be tied to foreign direct investment (FDI), which has surged since liberalisation (Central Bank, 2016), and tends to capitalise industries while making informal labour arrangements more widespread (World Bank, 2012). At least 90 per cent of self employment in Sri Lanka is 'own-account' work where the proprietor has no formal employees. Married women may be working as informal employees in such establishments; indeed, the growing share of women in unpaid family work implies as much (Figure A.2). The growth in self employment may have created new opportunities for married women if, for example, male household heads who are self employed hire female family members. The flexible work schedules associated with self employment may allow more married women to work without sacrificing domestic responsibilities. But self employment incomes come with greater uncertainty than salaried incomes, and this insecurity may have been what pushed less educated women into the labour force in growing numbers. This hypothesis is tested in Sections 4 and 5.

4 Determinants of Labour Force Participation

This section presents and estimates a model of female labour supply for Sri Lanka. The probability P_{it} that woman i at time $t$chooses to participate in wage work, self-employment, own-account work, unpaid family work, or search for a job (unemployment) is assumed to take the following functional form:

$$P_{it} = F(\alpha_{pt} + \beta_t X_{it} + \gamma_t Z_{it} + \epsilon_{it}) \tag{1}$$

The term F is the standard normal cumulative distribution function. Province fixed effects are captured in α_{pt}. The vector X_{it} contains explanatory variables for woman i and her household. This includes her education, which is a dummy variable for the highest level of schooling completed.[5] Household per-capita income (excluding her own earnings) reflects unearned income. Economic security is captured by a dummy variable for whether the household has an adult male with a salaried job. In the absence of data on wealth and asset income, education of the male household head provides an additional measure of socio-economic status. Also included are age, age-squared, and the number of children age 0-5 (pre-school) and 6-14 (school age).[6] A dummy variable for ethno-religious group reflects cultural and religious factors influencing participation. Muslim women are expected to participate the least, owing to traditions of female seclusion in their community. With their high concentration in the labour-intensive plantation sector, Indian Tamil women are expected to have the highest work propensity.

The variables in Z_{it} give the labour demand conditions in woman i's district of residence. Among them is the district share of male workers in agriculture, manufacturing, 'white-collar' industries (public administration and professional services), and 'trades' (retail and wholesale trade, transport, construction, utilities, social and personal services). The district population share of A-level and university education quantifies the extent of competition for good jobs. Labour market tightness comes from the district male unemployment rate.

Table 1: Sample Means of Regression Variables

	1992	1997	2003	2009	2014
Labour force participation	33.2	35.8	37.6	42.3	42.7
$<$ Primary	11.2	8.0	5.0	4.2	2.7
Primary	22.5	22.0	19.6	15.1	11.3
Lower secondary	22.0	19.9	17.1	14.9	12.6
Middle secondary	21.5	22.5	28.3	31.7	35.1
Ordinary level	17.0	18.8	17.4	17.1	18.1
Advanced level	4.7	7.3	10.6	14.0	16.5
University	1.1	1.5	2.0	2.9	3.8
Head $<$ Primary	5.9	4.2	3.8	2.9	2.2
Head Primary	28.8	30.1	26.6	23.0	18.9
Head Lower secondary	25.2	24.7	23.0	21.0	20.0
Head Middle secondary	19.3	17.5	21.9	25.8	30.5
Head Ordinary level	15.4	16.1	14.8	15.2	15.5
Head Advanced level	3.9	5.3	7.3	9.0	10.2
Head University	1.5	2.1	2.6	3.2	2.7
Log household income	9.3	9.6	9.7	9.8	10.0
Household size	5.4	5.2	4.8	4.5	4.4
Male wage earner	59.6	58.9	56.6	56.6	54.8
Age	40.8	40.8	41.2	42.5	43.3
Children age 0-5	0.49	0.49	0.46	0.46	0.47
Children age 6-14	1.11	0.94	0.78	0.66	0.65
Sinhalese buddhist	78.8	81.0	80.8	81.6	81.6
Sri Lankan Tamil	4.3	4.4	3.2	3.7	2.5
Indian Tamil	4.0	2.6	4.4	3.0	3.8
Muslim	6.0	5.5	5.6	5.8	6.4
Other ethno-religious	6.9	6.6	6.0	6.0	5.8
Agriculture	41.0	35.8	31.9	30.5	27.5
Manufacturing	10.6	12.1	13.5	14.9	15.5
Trades, construction, social	26.3	30.2	31.4	35.0	37.2
Public, professional	11.9	12.2	14.3	13.8	14.4
High education	7.3	9.7	12.9	16.1	18.5
Male unemployment	10.8	7.8	6.0	4.1	3.0
Western	32.5	33.5	33.7	34.9	32.9
Central	15.6	14.8	13.1	12.7	14.2
Southern	13.7	13.9	13.6	13.6	13.7
Northwestern	13.3	12.5	14.2	13.3	13.3
Northcentral	6.6	6.4	6.4	6.6	6.9
Uva	7.0	7.5	7.6	7.6	7.5
Sabaragamuwa	11.4	11.4	11.4	11.3	11.4
Obs	15,016	14,031	11,616	13,092	13,649

Notes: Married women age 25-65 who are not household heads. Northern and Eastern Provinces excluded. LFS sampling weights used. *Source*: Sri Lanka Labour Force Survey.

Ideally, woman i's potential wage would be among the explanatory variables, but this requires predicting wage offers for workers as well as non-workers. Previous researchers have used group averages to instrument for wages (Angrist, 1991; Juhn and Murphy, 1997; Blau and Kahn, 2007; Heim, 2007). Two such methods are attempted here. The first instrument is a set of group dummies for age, education, ethnicity, and district. The second instrument consists of district average wages, following Klasen and Pieters (2015) in their study

of women in urban India. Unfortunately, the results are highly inconsistent, with the magnitude and sign of the coefficient on predicted wage varying widely across instruments.[7] For these reasons, and because wage offers cannot be predicted for self-employed and unpaid family workers, potential wage is excluded from the labour supply model.

Table 1 summarises the data. Reading across columns highlights the trends and scale of socio-economic change in Sri Lanka. The population has aged, has become more educated, and is having fewer children. Women have reduced fertility and delayed it later into the life cycle, which explains why the number of school-age children has declined faster than the number of pre-school children. Household real incomes have doubled over a span of 23 years, and, because of shrinking household sizes, per-capita income has grown even faster. There are fewer households today with a male salaried worker than in 1992, signaling lower income stability for women. (Note that the share of households with *any* male income earner did not change.) The trades sector comprising low-skill service industries recorded the fastest employment growth, followed by manufacturing. The district shares of highly educated people more than doubled. District male unemployment rates fell from double digits in 1992 to 3 per cent in 2014, reflecting the economy's steady and sustained growth following liberalisation.

Estimation Results

Table 2 shows the estimated parameters of Equation 1 for 1992, 1997, 2003, 2009, and 2014.[8] The results are reported as average marginal effects — the change in the probability of labour force participation in response to a unit increase in the explanatory variable. (For dummy variables, this is the difference from the reference category). The coefficients for age and age-squared show the expected concave profile, with participation first increasing, then decreasing, with age. The age profile shifted considerably and became less concave, raising the peak age of participation from 33 in 1992 to 43 in 2014. The effect of children, particularly pre-school children, is negative and increased in magnitude.

Participation falls with higher household income, consistent with the classic income effect. This effect weakened, in line with a declining income elasticity as hypothesized in Section 3. Greater income stability (the presence of a male salaried earner) also has a negative impact on participation, but this effect strengthened, signifying a rising propensity to work in the absence of a stable income stream. Surprisingly, education of the male household head is hardly ever significant.[9]

The negative relationship between secondary schooling and participation shows up once again. The persistence of this pattern even after controlling for other potentially consequential variables provides further support for the presence of social stigmas associated with married women's labour. When women attain secondary schooling and thereby gain social status, the stigma against low-skill employment increases, raising the (fixed) utility cost of work and prompting labour force withdrawal. The relatively low returns to secondary schooling (see Figure 3) may reinforce this effect by making the economic gains from employment too small to overcome the fixed cost. Nevertheless, the negative relationship between secondary education and participation gradually weakened and was no longer statistically significant by 2014, consistent with robust wage growth and improving job opportunities for low-skill women as discussed in Section 3.

Table 2: Average marginal effects: married women, age 25-65

	1992	1997	2003	2009	2014
Age	0.027^{***}	0.035^{***}	0.046^{***}	0.047^{***}	0.051^{***}
	(0.004)	(0.006)	(0.003)	(0.004)	(0.005)
Age^2	-0.000^{***}	-0.000^{***}	-0.001^{***}	-0.001^{***}	-0.001^{***}
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Children age 0-5	-0.044^{***}	-0.063^{***}	-0.080^{***}	-0.080^{***}	-0.072^{***}
	(0.006)	(0.008)	(0.010)	(0.009)	(0.005)
Children age 6-14	-0.006	-0.009	-0.014^{**}	-0.013^{**}	-0.028^{***}
	(0.007)	(0.006)	(0.007)	(0.006)	(0.008)
Own education: reference = less than primary					
Primary	-0.044^{*}	-0.031	0.004	0.009	-0.016
	(0.024)	(0.020)	(0.042)	(0.025)	(0.046)
Lower secondary	-0.087^{***}	-0.108^{***}	-0.044	-0.017	-0.005
	(0.023)	(0.023)	(0.046)	(0.034)	(0.049)
Middle secondary	-0.110^{***}	-0.131^{***}	-0.076^{*}	-0.070^{***}	-0.055
	(0.027)	(0.020)	(0.040)	(0.025)	(0.042)
Ordinary level	-0.006	-0.016	-0.042	-0.023	-0.038
	(0.034)	(0.025)	(0.039)	(0.033)	(0.042)
Advanced level	0.272^{***}	0.217^{***}	0.182^{***}	0.105^{***}	0.082^{*}
	(0.039)	(0.030)	(0.034)	(0.033)	(0.043)
University	0.492^{***}	0.493^{***}	0.530^{***}	0.444^{***}	0.459^{***}
	(0.026)	(0.034)	(0.041)	(0.034)	(0.039)
Log HH income per cap	-0.069^{***}	-0.052^{***}	-0.058^{***}	-0.045^{***}	-0.055^{***}
	(0.008)	(0.013)	(0.012)	(0.007)	(0.007)
Male salaried worker	0.008	-0.060^{***}	-0.068^{***}	-0.100^{***}	-0.077^{***}
	(0.020)	(0.017)	(0.015)	(0.012)	(0.015)
Head's education: reference = less than primary					
Primary	0.028	0.048^{**}	0.009	0.008	-0.012
	(0.029)	(0.022)	(0.037)	(0.032)	(0.032)
Lower secondary	0.013	0.040	-0.006	-0.005	-0.028
	(0.026)	(0.027)	(0.031)	(0.032)	(0.030)
Middle secondary	-0.027	0.015	-0.013	-0.028	-0.051
	(0.037)	(0.028)	(0.040)	(0.036)	(0.033)
Ordinary level	0.020	0.030	-0.002	-0.021	-0.037
	(0.036)	(0.028)	(0.040)	(0.040)	(0.036)
Advanced level	-0.031	0.047	0.019	0.004	-0.045
	(0.046)	(0.038)	(0.044)	(0.041)	(0.050)
University	0.030	0.008	0.058	0.081^{**}	0.051
	(0.046)	(0.039)	(0.044)	(0.036)	(0.039)
Ethno-religious group: reference = Sinhalese buddhist					
Sri Lankan Tamil	0.081	0.098^{*}	0.009	0.022	-0.025
	(0.068)	(0.051)	(0.062)	(0.064)	(0.033)
Indian Tamil	0.252^{***}	0.213^{***}	0.145^{***}	0.163^{***}	0.159^{***}
	(0.069)	(0.055)	(0.034)	(0.038)	(0.020)
Muslim	-0.176^{***}	-0.222^{***}	-0.248^{***}	-0.290^{***}	-0.282^{***}
	(0.020)	(0.023)	(0.026)	(0.023)	(0.025)
Other ethno-religious	-0.008	-0.073^{**}	-0.028	-0.032^{**}	-0.031
	(0.017)	(0.033)	(0.036)	(0.014)	(0.021)

Continued on next page

Table 2 – *Continued from previous page*

District employment shares: reference = Agriculture					
Manufacturing	-0.757^{***}	0.071	-1.024^{***}	-0.948^{***}	-0.060
	(0.293)	(0.532)	(0.282)	(0.229)	(0.412)
Trade, construction	0.163	1.159^{***}	0.789^{*}	-0.111	-0.990^{***}
	(0.257)	(0.395)	(0.404)	(0.080)	(0.256)
Public, professional	-1.255^{**}	-1.501	0.490	0.716	1.790^{**}
	(0.571)	(1.220)	(0.500)	(0.812)	(0.759)
High education	-1.201	-2.313	-1.656^{**}	-0.475	-0.145
	(1.002)	(1.562)	(0.834)	(0.388)	(0.474)
Male unemployment	1.069^{*}	-4.370^{***}	-7.123^{***}	-0.531	-0.179
	(0.579)	(1.537)	(1.677)	(0.385)	(0.702)
Province: reference = Western					
Central	-0.012	0.046	-0.094	-0.010	0.101^{**}
	(0.027)	(0.066)	(0.061)	(0.023)	(0.040)
Southern	-0.055	0.085^{**}	0.141^{***}	0.004	0.003
	(0.042)	(0.036)	(0.043)	(0.028)	(0.040)
Northwestern	-0.043	-0.081	-0.115^{***}	-0.003	0.017
	(0.045)	(0.073)	(0.035)	(0.019)	(0.032)
Northcentral	0.035	-0.022	0.029	-0.001	-0.116
	(0.095)	(0.137)	(0.096)	(0.067)	(0.106)
Uva	-0.006	0.238^{***}	0.128^{**}	0.091^{**}	0.010
	(0.057)	(0.083)	(0.056)	(0.042)	(0.082)
Sabaragamuwa	-0.115^{***}	-0.113	0.026	0.026	0.041
	(0.040)	(0.090)	(0.049)	(0.030)	(0.035)
R^2	0.120	0.121	0.130	0.121	0.113
Observations	12,744	12,370	10,142	11,162	11,686

Marginal effects; district-clustered robust standard errors in parentheses
Marginal effect for dummy variables is the discrete change from reference category.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Moving up the education ladder, participation surges once post-secondary schooling is reached, reflecting privileged access to white-collar jobs, high wage returns to tertiary education, and (possible) non-random positive selection into higher education and work. But the positive participation effect of A-level education decreased by over two-thirds between 1992 and 2014. As described in Section 3, this may reflect intensified competition for scarce white-collar jobs as the population becomes more educated.[10] Indeed, the likelihood of working in a white-collar industry decreased for O-level and A-level graduates, who have become more concentrated in agriculture, manufacturing and low-skill services (Figure A.3 in the Appendix). University graduates, whose numbers did not increase nearly as much, have retained their hold on white-collar jobs. Unsurprisingly, their participation propensity barely changed between 1992 and 2014.

Looking further down Table 2, ethno-religious group has a strong influence on female labour supply. Compared to Sinhalese buddhists, Muslim women are 18-29 percent less likely and Indian Tamils 6-25 per cent more likely to work in a given year. Participation is lower in districts with higher manufacturing relative to agricultural employment, although this effect became small and insignificant by 2014 as more women entered manufacturing. Surprisingly, the district share of trades (low-skill services) has had an increasingly negative impact on participation over time. Further analysis reveals this is because the trades sector grew fastest in districts that were heavily agricultural in the early 1990s (not shown). Because agriculture is (still) the most important employer of married women, its displacement by low-skill services was large enough to

reduce female labour supply on net. White-collar jobs have increasingly drawn women into the labour force since 1992.

The district share of educated people, a proxy for competition for white-collar jobs, reduces participation, although this effect is statistically significant only in 2003. Male unemployment has a negative effect on female participation, consistent with the 'discouraged worker' effect. The exception is 1992 when male unemployment was double digits and married women responded by *increasing* labour supply, in line with the 'added worker' effect. Severe economic distress caused by the loss of male breadwinners' incomes may have compelled married women to find work.

These results give a detailed picture of the factors influencing married women's labour supply. The following decomposition exercise measures which among the individual covariates contributed most to changes in observed participation rates over the period 1992-2014.

5 Decomposition Exercise

The decomposition method used here was developed by Yun (2004) and is an extension of the Blinder-Oaxaca decomposition to non-linear models (Blinder, 1973; Oaxaca, 1973).[11] Denoting a given explanatory variable as k, the difference in labour force participation between year A and year B is decomposed as:

$$\bar{P}_B - \bar{P}_A = \sum_{k=1}^{K} W_{\Delta X}^k \left[\overline{F(X_B\beta_B)} - \overline{F(X_A\beta_B)}\right] + \sum_{k=1}^{K} W_{\Delta\beta}^k \left[\overline{F(X_A\beta_B)} - \overline{F(X_A\beta_A)}\right] \tag{2}$$

where

$$W_{\Delta X}^k = \frac{\left(\bar{X}_B^k - \bar{X}_A^k\right)\beta_B^k}{\left(\bar{X}_B - \bar{X}_A\right)\beta_B}, \quad W_{\Delta\beta}^k = \frac{\bar{X}_A^k\left(\beta_B^k - \beta_A^k\right)}{\bar{X}_A\left(\beta_B - \beta_A\right)}, \quad \textit{and} \quad \sum_{k=1}^{K} W_{\Delta X}^k = \sum_{k=1}^{K} W_{\Delta\beta}^k = 1$$

The term $\bar{P}$ is the average probability of participating in the labour force for the specified year. The first term on the right of Equation 2 measures the contributions of covariate changes (ΔX), evaluated at year B coefficients. The second term quantifies the effect of coefficient changes ($\Delta\beta$), calculated at year A covariates. The total effects of all covariates and all coefficients are obtained from summing up the contributions across the individual k effects. Table 3 reports the decomposition results. The decomposition in Column 1 applies Equation 2 with year $A = 2014$ and year $B = 1992$, while Column 2 uses year $A = 1992$ and year $B = 2014$. The 'true' results lie somewhere in between the numbers recorded in Columns 1 and 2.

The top panel shows married women in the sample increased their average participation rate by 9.5 percentage points over the 23 years between 1992 and 2014. Covariate effects are shown in the second panel. Rising education had the largest positive impact on women's labour supply. It accounted for participation increases of 2.5 and 1.6 percentage points when evaluated at 1992 and 2014 coefficients, respectively. (This discrepancy is largely due to the coefficient on A-level education being considerably smaller in 2014.) Declines in fertility and male salaried employment also had significant positive effects on participation. All remaining covariate changes depressed married women's labour supply. The largest adverse factor was rising household income, causing participation to fall 3.9 and 4.9 percentage points. Demographic ageing and the decline in agricultural employment also played a substantial role. Evaluated at 1992 coefficients only, the fall in male unemployment had a large negative effect on participation. This is due to 1992 being an outlier when women increased labour supply in response to high male unemployment. As unemployment fell, so did the positive 'added worker' response to it.

Table 3: Decomposition of labour force participation change, 1992-2014

	(1)		(2)	
$\bar{P}$(LF) 2014	0.427^{***}	(0.027)	0.427^{***}	(0.027)
$\bar{P}$(LF) 1992	0.332^{***}	(0.028)	0.332^{***}	(0.028)
Difference	0.095^{***}	(0.024)	0.095^{***}	(0.024)
Changes in covariates	*at 1992 coefficients*		*at 2014 coefficients*	
Age	-0.017^{***}	(0.004)	-0.007^{**}	(0.003)
Ethno-religious	-0.002	(0.004)	-0.002	(0.005)
HH income	-0.039^{***}	(0.007)	-0.049^{***}	(0.008)
Male salaried earner	-0.000	(0.001)	0.004^{***}	(0.001)
Children	0.002	(0.002)	0.015^{***}	(0.004)
Own education	0.025^{***}	(0.006)	0.016^{***}	(0.005)
Head education	-0.005^{*}	(0.003)	-0.006^{*}	(0.003)
Industry employment shares	-0.040^{**}	(0.019)	-0.021	(0.017)
High education share	-0.090	(0.066)	-0.018	(0.055)
Male unemployment share	-0.056^{*}	(0.029)	0.015	(0.058)
Province	0.000	(0.002)	-0.003	(0.003)
Changes in coefficients	*at 2014 covariates*		*at 1992 covariates*	
Age	0.430^{***}	(0.129)	0.598^{***}	(0.154)
Ethno-religious	-0.010^{*}	(0.005)	-0.016^{**}	(0.007)
HH income	0.118^{*}	(0.062)	0.153^{**}	(0.078)
Male salaried earner	-0.034^{***}	(0.010)	-0.054^{***}	(0.012)
Children	-0.018^{**}	(0.007)	-0.036^{**}	(0.014)
Own education	-0.000	(0.030)	0.025	(0.038)
Head education	-0.023	(0.031)	-0.036	(0.041)
Industry employment shares	0.053	(0.101)	0.032	(0.124)
High education share	0.147	(0.136)	0.083	(0.083)
Male unemployment share	-0.027^{*}	(0.015)	-0.143	(0.087)
Province	0.030	(0.033)	0.046	(0.047)
Constant	-0.349^{**}	(0.164)	-0.502^{**}	(0.216)
Total covariates	-0.222^{***}	(0.049)	-0.055	(0.072)
Total coefficients	0.317^{***}	(0.050)	0.150^{*}	(0.077)

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

The third panel of Table 3 shows the coefficient effects. The declining concavity of the age profile was the biggest positive coefficient change, increasing participation by 43 and 59.8 percentage points. Also important was the declining negative elasticity of household income, which increased participation rates by 11.8 and 15.3 percentage points. Comparing the second and third panels makes clear changes in behavioral parameters, rather than covariates, played the dominant role in increasing married women's labour supply in Sri Lanka. This is confirmed in the bottom panel as well: the combined positive coefficient effect was larger than the combined negative covariate effect. In the next section, the sources of these behavioral changes are probed further.

Analysis by Education and Age Group

This section attempts to identify which population subgroups, if any, were responsible for the behavioral (i.e. coefficient) changes responsible for the increase in married women's participation. The probit estimates revealed opposing behavioral shifts for less educated versus highly educated women — the former increased their labour market attachment while the latter decreased theirs. Thus, the decomposition is applied separately to women with up to middle secondary schooling and to those with O-level education and above.

Behavioral changes can also reflect differences across birth cohorts; for instance, young generations entering the sample each year may carry social attitudes and expectations for the future that differ from those of their predecessors. Generational change has been found to have played a crucial role in increasing female participation rates in advanced countries (Goldin, 1990; Euwals et al., 2011). A similar effect is plausible for emerging economies. To test for generational effects, the sample is separated by age group — young (age 25-34), middle (age 35-44), and old (age 45-54) — and the decomposition applied separately to each.[12] Within each age group, the samples observed in 1992 and 2014 were born 23 years apart, a plausibly adequate time span to capture cohort effects.

The full probit results for all sub-samples are given in Tables A.2 through A.6 in the Appendix.[13] Selected coefficient effects only are reported below in Table 4.[14] Panels 1 through 3 compare the three age samples. It shows the youngest age group (25-34) was responsible for the large decline in household income elasticity, which increased their participation by 28.1 and 48.6 percentage points (evaluated at 1992 and 2014 coefficients, respectively). This says the cohort born in the decade 1980-1989 was far less sensitive to household income than its predecessor born in 1958-1967. This behavioral change is all the more notable as the 1980-1989 cohort occupied households twice as rich as the 1958-1967 cohort did at the same age. Had there been no change in income elasticity across generations, the 1980-1989 cohort's participation levels would have been much *lower*, not higher, than that of the 1958-1967 cohort. For the middle-age groups (34-44), income elasticity fell very little across generations, implying the 1970-1979 cohort was only slightly less sensitive to household income than its predecessor born in 1948-1957. Thus, the declining participation effect of household income intensified with each subsequent generation.

The effect of male salaried earner displays a similar cohort pattern. Although the negative participation effect of a male salaried earner increased over time, this change was largest among the oldest birth cohorts. Tracking pairs of birth cohorts observed at the same age thus reveals a pattern of falling sensitivity to household economic status with each new generation.[15]

Results for the education samples are reported in the bottom two panels. As expected, behavioral changes occurred in opposite directions for the two education groups. Women with low education became less sensitive to household income, and were also responsible for the shifting age profile in favor of older women. For educated women, the negative participation effects of household income and children increased, while the positive participation effect of education decreased, signaling an overall retreat from labour force activity.

Table 4: Yun Decomposition by Education and Age Group

Changes in coefficients	(1) *at 2014 covariates*		(2) *at 1992 covariates*	
Young (age 25-34)				
Log HH income	0.281^{**}	(0.119)	0.486^{**}	(0.197)
Male salaried earner	-0.020	(0.014)	-0.041	(0.026)
Middle-age (age 35-44)				
Log HH income	0.028	(0.141)	0.029	(0.145)
Male salaried earner	-0.039^{**}	(0.017)	-0.048^{**}	(0.019)
Old (age 45-54)				
Log HH income	-0.038	(0.147)	-0.051	(0.196)
Male salaried earner	-0.055^{***}	(0.018)	-0.087^{***}	(0.021)
Low education (up to middle secondary)				
Age	0.467^{***}	(0.165)	0.687^{***}	(0.186)
Log HH income	0.189^{**}	(0.078)	0.260^{***}	(0.099)
Male salaried earner	-0.040^{***}	(0.015)	-0.066^{***}	(0.015)
High education (O-level to university)				
Own education	-0.050^{***}	(0.008)	-0.028^{**}	(0.011)
Log HH income	-0.295^{***}	(0.102)	-0.321^{*}	(0.173)
Children	-0.033^{***}	(0.012)	-0.049^{**}	(0.023)
Ethno-religious	-0.007^{**}	(0.003)	-0.012^{*}	(0.007)
Industry employment shares	-0.219^{***}	(0.085)	-0.258^{*}	(0.132)
High education share	0.416^{***}	(0.116)	0.199^{*}	(0.116)

Standard errors in parentheses

$^{*}\ p < 0.1$, $^{**}\ p < 0.05$, $^{***}\ p < 0.01$

6 Conclusion

This paper investigated the determinants and trends of married women's labour force participation in Sri Lanka. The study was motivated by the long-run 'feminisation U' theory linking female labour supply to economic development, and a more recent body of work challenging this theory. The analysis reveals women's labour market experiences during Sri Lanka's rapid economic development are consistent with many aspects of the U-shape theory. At the same time, some trends reflect the specific process of structural transformation in the country, as has been found in micro-level studies of other emerging markets.

Analysis of household data reveals Sri Lankan women's participation decisions are influenced by age, fertility and household income, factors well established in the literature. A key finding is the negative participation effect of secondary schooling, a pattern documented in other emerging economies, such as India, where female participation is low relative to GDP. Researchers attribute this to social stigmas that impose a utility cost on married women in low-skill jobs. This stigma increases when women gain secondary education and commensurate social status, prompting labour force withdrawal. The utility cost disappears at the highest education levels when women can access socially acceptable, 'feminised' white-collar jobs such as teaching, nursing, and public administration. The strict occupational segregation of married women by education level supports this hypothesis. Notably, such patterns are largely absent for single women and for men.

Decomposing the increase in participation over time shows educational attainment and falling fertility played an important role in drawing more women into the labour force. The biggest factor, however, was the change in women's labour supply behavior; specifically, the declining sensitivity to household income and old age among women with primary and secondary education. Evidence points to younger birth cohorts dominating these behavioral shifts. This is consistent with changes on the demand side, where less educated women enjoyed a doubling of real wages and job growth in manufacturing and low-skill services. It thus appears economic growth in Sri Lanka has followed the pattern of comparative advantage, boosting labour demand in low-skill sectors and expanding market opportunities for less educated women. But the labour market prospects of educated women have diminished. Public administration and professional services, by far the largest employer of educated women, recorded the slowest employment growth. This, along with rapid education expansion, appears to have intensified job competition, pushing O-level and A-level educated women out of white-collar jobs. In response, educated married women have withdrawn from market work — the positive participation effect of A-level education decreased two-thirds, while the negative effects of household income and children increased substantially.

Studies of other emerging markets, such as India and Morocco, also find that economic growth was tied to the lower end of the skill spectrum. This raises concerns about the mismatch between social aspirations and the realities of structural transformation in low-skill, labour-abundant countries. Limited opportunities in high-skill jobs could further discourage educated women from market activity and reduce private incentives for investing in higher education. Also at risk is further 'brain drain' from these countries. A workforce thus diminished in skill could hurt public and private sector initiatives to develop high-skill sectors, adopt new production technologies, and attract foreign direct investment, ultimately harming future economic growth. Furthermore, frustrations stemming from this mismatch between aspirations and reality can lead to conflict along ethnic, religious and sectoral lines, a pervasive problem in culturally diverse societies like Sri Lanka and India.

The growing prevalence of self employment in Sri Lanka is another cause for concern, for it goes against the tide of economic development (ILO, 2017). A possible explanation is the surge in foreign direct investment (FDI) since liberalisation (Central Bank, 2016), as FDI tends to capitalise industries and make informal labour more widespread (World Bank, 2012). FDI has also been linked to rising informalisation of jobs in India (Noronha and D'Cruz, 2017). One the one hand, self employment can give married women the necessary flexibility to juggle market and domestic work, especially in light of Sri Lanka's rigid labour laws

restricting part-time work in the formal sector (Vodopivec and Arunatilake, 2011).[16] On the other hand, self employment is associated with less income security and fewer benefits like government-sponsored pension plans (World Bank, 2012). This paper shows that the decline in male salaried employment in households has increased labour force participation by less educated married women. While this could be a positive sign of economic opportunity for low-skill women, for example in husband-wife self employment partnerships, it may also be a distress response to greater income uncertainty.

That robust economic growth coincided with rising female participation in Sri Lanka, when it failed to do so in many other emerging markets, gives cause for optimism. The difference could stem from Sri Lanka's relative success in narrowing infrastructure gaps between urban and rural areas. Successive governments have invested in rural roads, village industries, irrigation systems, and major highways linking regional hubs. These projects have been linked to improvements in women's health, such as maternal mortality (World Bank, 2012), and large declines in poverty (Newhouse et al., 2016), so it is reasonable to think they may have also facilitated women's access to jobs. However, much more needs to be done. Participation levels remain low relative to GDP, and many women cannot access stable jobs in the formal sector commensurate with their skills. These problems still persist in much of the developing world, even where economic growth has been robust and women have made substantial gains in education and family planning. As ageing populations bring economic slowdowns and rising fiscal burdens in the next 20-30 years, there is an urgent need to absorb more women into productive market work.

Notes

[1]The only other paper examining female participation in Sri Lanka is Gunatilaka (2013), who estimates a similar binary choice model with 2009 data, but does not examine changes over time.

[2]The falling participation rates of women age 15-24 are due to rising educational attainment: the share of young single women citing education as the reason for non-participation rose 8.2 percentage points between 1992 and 2014.

[3]'O level' and 'A level' refer to two national examinations administered by the central government. The O-level exam is taken in grade 11 and a passing score qualifies students for A-level coursework. The A-level exam is taken in grade 13 and a passing score is required for entrance to the public university system. These qualifications are required for many skilled jobs.

[4]It is doubtful, however, that rising life expectancy is a factor. Average life expectancies in Sri Lanka were already close to those of developed countries by 1992 and have increased by just five years since then (World Bank, 2017). This change seems too small to explain the large increases in older women's participation.

[5]The LFS does not report years of schooling.

[6]School attendance is mandatory through age 14 in Sri Lanka.

[7]Results are available upon request.

[8]Logistic regression gives almost identical results.

[9]Replacing education of the household head with education of the woman's spouse does not change this result.

[10]Another possibility is that A-level graduates have become less positively selected as their numbers expanded. Although modeling educational choice is beyond the scope of this paper, an indirect test for selection effects, using age-education interactions in the probit model, does not support this hypothesis.

[11]The Yun decomposition is similar to several others used in the literature (Even and Macpherson, 1990; Nielsen, 1998; Fairlie, 2005). The much more computationally intensive Fairlie (2005) method is also used here as a robustness check and yields almost identical results.

[12]The 55-65 age group had to be left out due to too few observations with university education.

[13]Instead of separating the sample by age and education, all variables in the full sample could have been interacted with age group and education. Unfortunately, the decomposition technique cannot be applied to interaction effects.

[14]As with the full sample, the coefficient effects are much greater than the covariate effects.

[15]To verify these results, the full sample was tested again, but with dummies for age group interacted with household income and male salaried earner. The results confirm the findings reported here and are available upon request.

[16]Indeed, Sri Lanka's rigid labour laws may have themselves helped prompt the rise in self employment as the economy grew.

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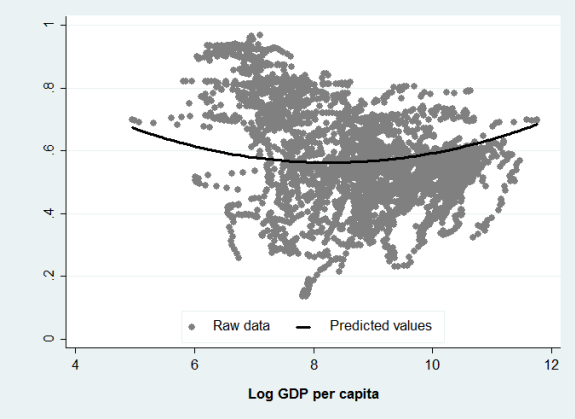
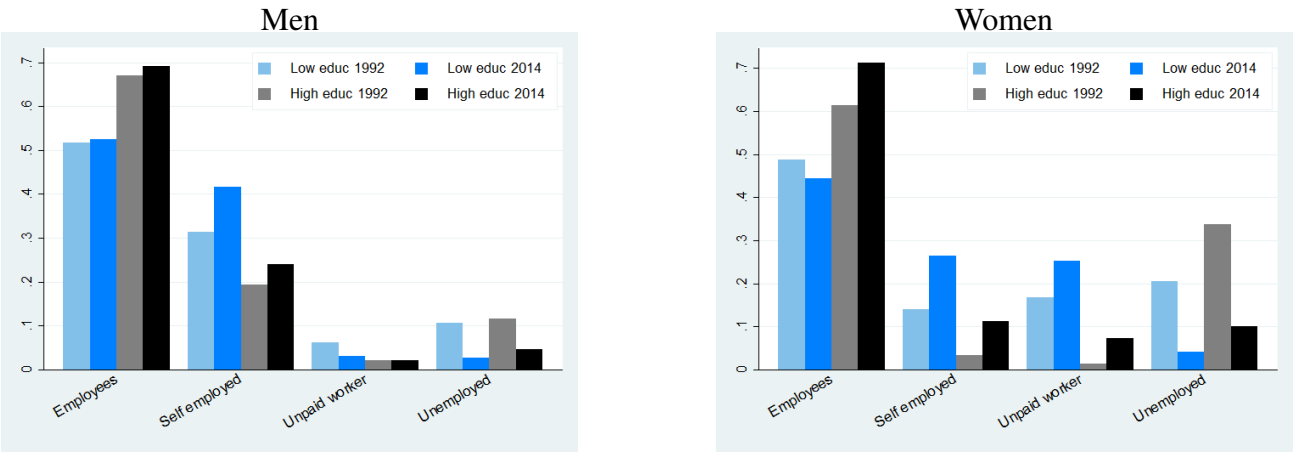
Appendix

Figure A.1: Female Labour Force Participation: 1992-2014



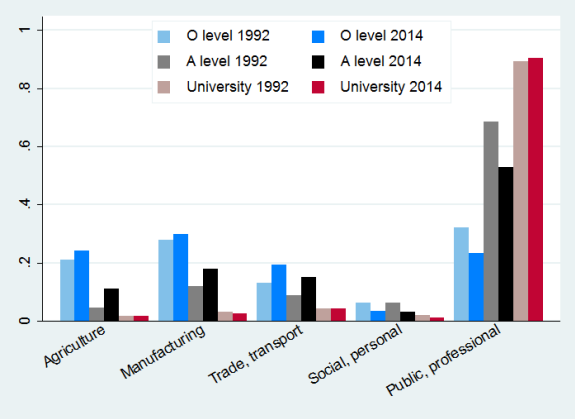
Notes: Solid line plots fitted values of cross-country regression of FLFP on real GDP and its square, with year and fixed effects. *Source*: ILOSTAT, Penn World Tables

Figure A.2: Shares of Male and Female Workers by Employment Status



Notes: All men and women in labour force.
Source: Sri Lanka Labour Force Survey

Figure A.3: Shares of Educated Female Workforce by Industry



Notes: All female workers with O-level education and above, including wage employees, the self-employed, and unpaid family workers. *Source*: Sri Lanka Labour Force Survey

Table A.1: Population and Labour Force Trends, 1992-2014

	1992	2014	2014 (incl. N & E)	Δ
Total population (millions)	14.4	17.6	(20.3)	22.2%
Female population shares (%):				
Age 15-24	10.1	7.0	(7.2)	−3.1
Age 25-65	23.4	28.3	(28.0)	4.9
Age 66+	2.2	5.0	(4.8)	2.8
Total labour force participation rate (%)	55.6	54.0	(53.0)	−1.6
Female participation rates (%):				
Age 15-24	37.0	24.0	(22.6)	−13.0
Age 25-65	38.7	43.9	(41.8)	5.2
Age 66+	5.0	9.4	(9.0)	4.4
Total labour force age 15+ (millions)	5.7	7.2	(8.0)	25.3%
Female labour force shares (%)				
Age 15-24	9.5	4.1	(4.1)	−5.4
Age 25-65	22.8	30.6	(29.6)	7.8
Age 66+	0.3	1.2	(1.1)	0.9

Statistics computed using sampling weights provided by the LFS.
Column 4 includes the Northern and Eastern Provinces.
Source: Sri Lanka Labour Force Survey.

Table A.2: Average marginal effects: young sample (age 25-34)

	1992	1997	2003	2009	2014
Age	−0.042	0.048	0.046	−0.015	0.012
	(0.088)	(0.074)	(0.065)	(0.062)	(0.043)
Age^2	0.001	−0.001	−0.001	0.000	−0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Children age 0-5	−0.045***	−0.073***	−0.086***	−0.104***	−0.070***
	(0.008)	(0.010)	(0.013)	(0.012)	(0.008)
Chidren age 6-14	−0.013**	−0.013	−0.024***	−0.018*	−0.029***
	(0.006)	(0.008)	(0.009)	(0.009)	(0.010)
Own education: reference = less than primary					
Primary	−0.084	−0.075	−0.156**	0.071	0.155**
	(0.055)	(0.058)	(0.071)	(0.098)	(0.070)
Lower secondary	−0.134**	−0.123**	−0.178**	−0.084	0.115
	(0.056)	(0.051)	(0.076)	(0.101)	(0.102)
Middle secondary	−0.189***	−0.153***	−0.260***	−0.145*	0.018
	(0.055)	(0.053)	(0.074)	(0.087)	(0.099)
Ordinary level	−0.112**	−0.045	−0.216***	−0.127	0.034
	(0.054)	(0.044)	(0.071)	(0.094)	(0.101)
Advanced level	0.227***	0.191***	−0.031	0.001	0.136
	(0.062)	(0.056)	(0.078)	(0.076)	(0.092)
University	0.409***	0.444***	0.389***	0.402***	0.572***
	(0.070)	(0.074)	(0.098)	(0.107)	(0.090)
Log HH income per cap	−0.105***	−0.045*	−0.069***	−0.049**	−0.048***
	(0.020)	(0.025)	(0.013)	(0.019)	(0.016)
Male salaried worker	0.001	−0.056**	−0.057***	−0.077***	−0.059***
	(0.032)	(0.027)	(0.020)	(0.023)	(0.021)
Head's education: reference = less than primary					
Primary	0.044	0.155***	0.010	0.005	−0.008
	(0.027)	(0.030)	(0.063)	(0.051)	(0.062)
Lower secondary	0.021	0.127***	0.003	0.027	0.022
	(0.033)	(0.043)	(0.053)	(0.053)	(0.064)
Middle secondary	0.007	0.106***	−0.021	−0.006	0.003
	(0.032)	(0.039)	(0.066)	(0.054)	(0.062)
Ordinary level	0.099**	0.107***	−0.032	0.071	0.053
	(0.040)	(0.040)	(0.051)	(0.066)	(0.071)
Advanced level	−0.014	0.097**	0.009	0.044	0.082
	(0.048)	(0.044)	(0.073)	(0.081)	(0.074)
University	0.190***	0.122	0.103	0.093	0.229***
	(0.039)	(0.087)	(0.094)	(0.104)	(0.075)

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Table A.2 – *Continued from previous page*

Ethno-religious group: reference = Sinhalese buddhist					
Sri Lankan Tamil	0.076	0.151**	−0.038	0.042	0.050
	(0.072)	(0.063)	(0.075)	(0.069)	(0.063)
Indian Tamil	0.340***	0.280***	0.230***	0.234***	0.259***
	(0.103)	(0.070)	(0.048)	(0.036)	(0.044)
Muslim	−0.192***	−0.222***	−0.212***	−0.208***	−0.225***
	(0.038)	(0.036)	(0.027)	(0.027)	(0.026)
Other ethno-rel	−0.039*	−0.071**	−0.059*	0.030	−0.021
	(0.022)	(0.033)	(0.032)	(0.019)	(0.029)
District employment shares: reference = Agriculture					
Manufacturing	−0.497*	−0.113	−1.175***	−0.962***	0.111
	(0.273)	(0.563)	(0.256)	(0.272)	(0.592)
Trade, construction	0.655***	1.116**	1.055***	−0.695***	−1.060**
	(0.246)	(0.445)	(0.320)	(0.182)	(0.414)
Public, professional	−1.531**	−0.760	1.002**	0.208	2.280**
	(0.668)	(1.451)	(0.429)	(0.871)	(1.013)
High education	−3.477***	−3.679*	−3.303***	0.247	−0.258
	(1.025)	(1.883)	(0.620)	(0.400)	(0.666)
Male unemployment	0.830	−4.999***	−5.270***	0.669	0.336
	(0.682)	(1.650)	(1.333)	(0.568)	(0.904)
Province: reference = Western					
Central	0.014	0.023	−0.143**	−0.068*	0.147**
	(0.030)	(0.071)	(0.057)	(0.040)	(0.061)
Southern	−0.093**	0.068***	0.038	−0.158***	−0.031
	(0.043)	(0.026)	(0.033)	(0.044)	(0.051)
Northwestern	−0.003	−0.089	−0.174***	−0.039	0.013
	(0.045)	(0.076)	(0.037)	(0.037)	(0.043)
Northcentral	0.079	−0.090	−0.025	−0.086	−0.154
	(0.103)	(0.138)	(0.082)	(0.054)	(0.122)
Uva	0.046	0.193**	0.142***	−0.025	−0.002
	(0.059)	(0.082)	(0.053)	(0.070)	(0.117)
Sabaragamuwa	−0.180***	−0.156*	−0.087**	−0.067	0.021
	(0.039)	(0.094)	(0.038)	(0.053)	(0.041)
R^2	0.138	0.142	0.151	0.128	0.128
Observations	4075	3860	3056	2995	2994

Marginal effects; district-clustered robust standard errors in parentheses

Marginal effect for dummy variables is the discrete change from reference category.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table A.3: Average marginal effects: middle-age sample (age 35-44)

	1992	1997	2003	2009	2014
Age	−0.015	0.144*	0.090	0.208***	0.005
	(0.119)	(0.083)	(0.088)	(0.069)	(0.104)
Age^2	0.000	−0.002*	−0.001	−0.003***	0.000
	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)
Children 0-5	−0.034***	−0.066***	−0.072***	−0.099***	−0.070***
	(0.010)	(0.012)	(0.017)	(0.016)	(0.018)
Children 6-14	−0.003	−0.012	−0.018**	−0.025***	−0.031***
	(0.009)	(0.008)	(0.009)	(0.008)	(0.011)
Own education: reference =less than primary					
Primary	−0.067	−0.050	−0.042	0.017	−0.077
	(0.070)	(0.040)	(0.055)	(0.051)	(0.091)
Lower secondary	−0.106	−0.168***	−0.115**	0.014	−0.093
	(0.067)	(0.036)	(0.057)	(0.060)	(0.091)
Middle secondary	−0.085	−0.189***	−0.123*	−0.067	−0.113
	(0.062)	(0.028)	(0.065)	(0.054)	(0.077)
Ordinary level	0.017	−0.096*	−0.100*	0.000	−0.094
	(0.075)	(0.049)	(0.052)	(0.057)	(0.084)
Advanced level	0.251***	0.149***	0.140**	0.124**	0.042
	(0.084)	(0.043)	(0.058)	(0.063)	(0.084)
University	0.486***	0.430***	0.424***	0.493***	0.404***
	(0.058)	(0.067)	(0.063)	(0.059)	(0.083)
Log HH income per cap	−0.068***	−0.050**	−0.059***	−0.068***	−0.065***
	(0.012)	(0.022)	(0.020)	(0.014)	(0.014)
Male salaried earner	0.001	−0.063***	−0.088***	−0.123***	−0.073***
	(0.028)	(0.017)	(0.025)	(0.015)	(0.017)
Head's education: reference = less than primary					
Primary	0.087	−0.036	0.028	0.048	−0.046
	(0.056)	(0.036)	(0.062)	(0.049)	(0.069)
Lower secondary	0.068	−0.023	0.012	0.023	−0.085
	(0.046)	(0.040)	(0.052)	(0.040)	(0.066)
Middle secondary	0.023	−0.063	0.014	0.028	−0.090
	(0.060)	(0.045)	(0.067)	(0.047)	(0.065)
Ordinary level	0.049	−0.006	0.051	0.033	−0.106
	(0.064)	(0.053)	(0.076)	(0.057)	(0.068)
Advanced level	0.060	0.031	0.023	0.013	−0.107
	(0.054)	(0.052)	(0.070)	(0.052)	(0.069)
University	0.047	−0.079	0.064	0.164***	0.037
	(0.088)	(0.058)	(0.061)	(0.056)	(0.094)

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Table A.3 – *Continued from previous page*

Ethno-religious group: reference = Sinhalese buddhist					
Sri Lankan Tamil	0.212^{***}	0.038	0.110	-0.011	-0.037
	(0.080)	(0.066)	(0.097)	(0.080)	(0.031)
Indian Tamil	0.298^{***}	0.250^{***}	0.262^{***}	0.286^{***}	0.247^{***}
	(0.073)	(0.083)	(0.048)	(0.032)	(0.055)
Muslim	-0.187^{***}	-0.237^{***}	-0.295^{***}	-0.325^{***}	-0.318^{***}
	(0.035)	(0.047)	(0.036)	(0.043)	(0.032)
Other ethno-rel	0.002	-0.108	-0.018	-0.026	-0.090^{**}
	(0.032)	(0.071)	(0.038)	(0.023)	(0.039)
District employment shares: reference = Agriculture					
Manufacturing	-0.888^{**}	0.241	-1.013^{***}	-1.102^{***}	-0.241
	(0.392)	(0.538)	(0.367)	(0.338)	(0.437)
Trade, construction	-0.444	1.257^{***}	0.364	0.107	-0.714^{**}
	(0.379)	(0.411)	(0.489)	(0.110)	(0.346)
Public, professional	-1.741^{**}	-2.121^{*}	0.577	1.493	0.759
	(0.741)	(1.281)	(0.624)	(1.011)	(0.677)
High education share	0.895	-1.750	-0.746	-1.119^{**}	-0.417
	(1.443)	(1.577)	(1.123)	(0.535)	(0.548)
Male unemployment	1.926^{***}	-5.379^{***}	-7.606^{***}	0.095	-0.607
	(0.717)	(1.552)	(2.287)	(0.634)	(0.956)
Province: reference = Western					
Central	-0.023	0.076	-0.072	-0.042	0.012
	(0.029)	(0.067)	(0.067)	(0.036)	(0.042)
Southern	-0.056	0.139^{***}	0.099^{*}	0.020	-0.082^{**}
	(0.047)	(0.042)	(0.056)	(0.032)	(0.040)
Northwestern	-0.081	-0.097	-0.109^{***}	0.043^{*}	0.017
	(0.050)	(0.073)	(0.041)	(0.025)	(0.025)
Northcentral	0.017	0.008	-0.022	0.069	-0.119
	(0.084)	(0.142)	(0.109)	(0.096)	(0.092)
Uva	-0.084	0.284^{***}	0.112	0.127^{***}	-0.049
	(0.068)	(0.081)	(0.078)	(0.044)	(0.082)
Sabaragamuwa	-0.046	-0.073	0.042	0.068^{**}	-0.069^{*}
	(0.053)	(0.096)	(0.063)	(0.034)	(0.037)
R^2	0.098	0.114	0.127	0.134	0.125
Observations	4300	4116	3311	3362	3271

Marginal effects; district-clustered robust standard errors in parentheses

Marginal effect for dummy variables is the discrete change from reference category.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table A.4: Average marginal effects: old sample (age 45-54)

	1992	1997	2003	2009	2014
Age	−0.016	−0.073	0.234**	0.175*	0.227
	(0.131)	(0.137)	(0.098)	(0.102)	(0.169)
Age^2	−0.000	0.001	−0.002**	−0.002*	−0.002
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
Children 0-5	−0.066**	−0.024	−0.047**	−0.014	−0.074***
	(0.026)	(0.023)	(0.020)	(0.023)	(0.024)
Children 6-14	0.006	0.005	0.009	0.007	−0.021
	(0.013)	(0.012)	(0.013)	(0.017)	(0.016)
Own education: reference =less than primary					
Primary	−0.032	−0.001	−0.003	−0.012	−0.008
	(0.035)	(0.043)	(0.059)	(0.053)	(0.054)
Lower secondary	−0.095***	−0.065*	−0.056	−0.027	−0.028
	(0.033)	(0.039)	(0.052)	(0.051)	(0.049)
Middle secondary	−0.107**	−0.085**	−0.073*	−0.081	−0.046
	(0.044)	(0.040)	(0.040)	(0.050)	(0.062)
Ordinary level	0.048	0.066	−0.018	−0.018	−0.003
	(0.058)	(0.056)	(0.054)	(0.060)	(0.062)
Advanced level	0.336***	0.307***	0.290***	0.153***	0.112*
	(0.106)	(0.067)	(0.039)	(0.054)	(0.066)
University	0.523***	0.587***	0.584***	0.506***	0.454***
	(0.057)	(0.044)	(0.048)	(0.049)	(0.060)
Log HH income per cap	−0.040**	−0.050***	−0.073***	−0.046**	−0.054***
	(0.016)	(0.014)	(0.015)	(0.021)	(0.015)
Male salaried earner	0.037	−0.064**	−0.056***	−0.107***	−0.097***
	(0.026)	(0.025)	(0.021)	(0.020)	(0.029)
Head's education: reference = less than primary					
Primary	−0.032	−0.001	−0.003	−0.012	−0.008
	(0.035)	(0.043)	(0.059)	(0.053)	(0.054)
Lower secondary	−0.095***	−0.065*	−0.056	−0.027	−0.028
	(0.033)	(0.039)	(0.052)	(0.051)	(0.049)
Middle secondary	−0.107**	−0.085**	−0.073*	−0.081	−0.046
	(0.044)	(0.040)	(0.040)	(0.050)	(0.062)
Ordinary level	0.048	0.066	−0.018	−0.018	−0.003
	(0.058)	(0.056)	(0.054)	(0.060)	(0.062)
Advanced level	0.336***	0.307***	0.290***	0.153***	0.112*
	(0.106)	(0.067)	(0.039)	(0.054)	(0.066)
University	0.523***	0.587***	0.584***	0.506***	0.454***
	(0.057)	(0.044)	(0.048)	(0.049)	(0.060)

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Table A.4 – *Continued from previous page*

Ethno-religious group: reference = Sinhalese buddhist					
Sri Lankan Tamil	-0.032	0.186^{***}	-0.018	0.030	-0.018
	(0.063)	(0.057)	(0.051)	(0.075)	(0.076)
Indian Tamil	0.222	0.187^{***}	0.008	-0.047	0.001
	(0.176)	(0.049)	(0.030)	(0.065)	(0.035)
Muslim	-0.195^{***}	-0.260^{***}	-0.238^{***}	-0.361^{***}	-0.316^{***}
	(0.035)	(0.036)	(0.055)	(0.028)	(0.047)
Other ethno-rel	-0.042	-0.050	-0.040	-0.116^{***}	0.029
	(0.037)	(0.060)	(0.077)	(0.023)	(0.028)
District employment shares: reference = Agriculture					
Manufacturing	-1.058^{***}	0.191	-0.597	-1.017^{***}	-0.843
	(0.329)	(0.591)	(0.402)	(0.184)	(0.688)
Trade, construction	0.594^{**}	0.993^{**}	0.795	0.019	-1.024^{**}
	(0.270)	(0.466)	(0.511)	(0.107)	(0.505)
Public, professional	-1.554^{**}	-1.697	-0.108	0.966	2.955^{***}
	(0.703)	(1.120)	(0.624)	(0.746)	(1.080)
High education share	-1.337	-1.586	-0.842	-0.985^{***}	-0.576
	(1.073)	(1.327)	(1.072)	(0.343)	(0.861)
Male unemployment	1.659^{**}	-3.470^{**}	-8.944^{***}	-1.614^{***}	-1.528
	(0.784)	(1.469)	(2.050)	(0.411)	(1.588)
Province: reference = Western					
Central	0.000	0.073	-0.058	0.014	0.072
	(0.038)	(0.071)	(0.077)	(0.025)	(0.072)
Southern	-0.075	0.072	0.261^{***}	0.062^{**}	0.079
	(0.053)	(0.055)	(0.052)	(0.031)	(0.060)
Northwestern	-0.010	-0.081	-0.066	-0.047^{*}	-0.002
	(0.061)	(0.073)	(0.048)	(0.025)	(0.044)
Northcentral	0.116	-0.021	0.168	-0.055	-0.214^{*}
	(0.128)	(0.135)	(0.132)	(0.049)	(0.126)
Uva	0.107	0.211^{**}	0.103	0.132^{***}	-0.086
	(0.070)	(0.098)	(0.063)	(0.044)	(0.115)
Sabaragamuwa	-0.110^{**}	-0.086	0.142^{**}	0.016	0.122^{**}
	(0.051)	(0.091)	(0.066)	(0.040)	(0.060)
R^2	0.106	0.109	0.105	0.130	0.097
Observations	2835	2940	2591	2995	3177

Marginal effects; district-clustered robust standard errors in parentheses

Marginal effect for dummy variables is the discrete change from reference category.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table A.5: Average marginal effects: low education sample

	1992	1997	2003	2009	2014
Age	0.022***	0.032***	0.038***	0.042***	0.049***
	(0.005)	(0.008)	(0.006)	(0.005)	(0.006)
Age^2	−0.000***	−0.000***	−0.000***	−0.001***	−0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Children 0-5	−0.049***	−0.062***	−0.096***	−0.077***	−0.067***
	(0.008)	(0.008)	(0.012)	(0.011)	(0.009)
Children 6-14	−0.004	−0.005	−0.011*	−0.007	−0.018**
	(0.008)	(0.007)	(0.007)	(0.006)	(0.007)
Own education: reference = less than primary					
Primary	−0.040	−0.024	0.006	0.012	−0.013
	(0.026)	(0.018)	(0.042)	(0.024)	(0.046)
Lower secondary	−0.076***	−0.091***	−0.036	−0.013	0.003
	(0.026)	(0.021)	(0.046)	(0.032)	(0.050)
Middle secondary	−0.092***	−0.109***	−0.069*	−0.070***	−0.040
	(0.030)	(0.019)	(0.041)	(0.023)	(0.045)
Log HH income per cap	−0.083***	−0.065***	−0.076***	−0.049***	−0.059***
	(0.008)	(0.016)	(0.013)	(0.009)	(0.008)
Male salaried earner	0.005	−0.082***	−0.074***	−0.133***	−0.103***
	(0.023)	(0.015)	(0.019)	(0.012)	(0.018)
Head's education: reference = less than primary					
Primary	0.035	0.044**	0.018	0.015	0.005
	(0.031)	(0.021)	(0.034)	(0.033)	(0.035)
Lower secondary	0.017	0.044*	−0.000	−0.001	−0.025
	(0.026)	(0.026)	(0.031)	(0.031)	(0.032)
Middle secondary	−0.030	0.008	−0.008	−0.023	−0.049
	(0.037)	(0.024)	(0.037)	(0.037)	(0.037)
Ordinary level	0.001	−0.006	0.009	−0.045	−0.084*
	(0.047)	(0.033)	(0.038)	(0.043)	(0.045)
Advanced level	0.023	−0.056	0.008	0.023	−0.064
	(0.061)	(0.048)	(0.047)	(0.058)	(0.062)
University	0.116	0.345***	0.059	0.184**	0.147
	(0.091)	(0.105)	(0.140)	(0.076)	(0.096)
Ethno-religious group: reference = Sinhalese buddhist					
Sri Lankan Tamil	0.119**	0.148***	0.045	0.072	0.020
	(0.060)	(0.040)	(0.061)	(0.061)	(0.029)
Indian Tamil	0.263***	0.232***	0.146***	0.170***	0.175***
	(0.071)	(0.055)	(0.033)	(0.038)	(0.020)
Muslim	−0.194***	−0.233***	−0.280***	−0.316***	−0.296***
	(0.026)	(0.028)	(0.022)	(0.026)	(0.025)
Other ethno-rel	−0.030	−0.130***	−0.039	−0.061***	0.004
	(0.022)	(0.030)	(0.041)	(0.021)	(0.031)

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Table A.5 – *Continued from previous page*

District employment shares: reference = Agriculture					
Manufacturing	-0.850^{**}	0.205	-1.064^{***}	-0.765^{**}	-0.451
	(0.413)	(0.598)	(0.365)	(0.310)	(0.615)
Trade, construction	0.245	1.326^{***}	0.839^{*}	-0.047	-0.766^{*}
	(0.332)	(0.419)	(0.431)	(0.107)	(0.402)
Public, professional	-1.630^{**}	-1.835	0.341	0.219	2.011^{**}
	(0.734)	(1.308)	(0.571)	(0.952)	(1.023)
High education share	-0.890	-2.577	-1.216	-0.194	-0.443
	(1.404)	(1.711)	(0.938)	(0.512)	(0.791)
Unemployment	1.131	-4.292^{***}	-8.292^{***}	-0.900	-0.235
	(0.760)	(1.585)	(1.829)	(0.585)	(1.245)
Province: reference = Western					
Central	-0.014	0.062	-0.087	0.006	0.082
	(0.042)	(0.075)	(0.063)	(0.033)	(0.073)
Southern	-0.060	0.127^{***}	0.180^{***}	0.014	-0.012
	(0.056)	(0.041)	(0.057)	(0.033)	(0.048)
Northwestern	-0.040	-0.043	-0.115^{***}	-0.025	0.025
	(0.060)	(0.076)	(0.037)	(0.023)	(0.040)
Northcentral	0.045	0.033	0.066	0.038	-0.139
	(0.115)	(0.149)	(0.113)	(0.087)	(0.131)
Uva	0.004	0.303^{***}	0.157^{**}	0.094^{**}	-0.006
	(0.076)	(0.087)	(0.066)	(0.043)	(0.116)
Sabaragamuwa	-0.120^{**}	-0.085	0.059	0.028	0.057
	(0.055)	(0.095)	(0.060)	(0.036)	(0.051)
R^2	0.131	0.140	0.135	0.123	0.104
Observations	9042	9231	7163	7606	7346

Marginal effects; district-clustered robust standard errors in parentheses

Marginal effect for dummy variables is the discrete change from reference category.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table A.6: Average marginal effects: high education sample

	1992	1997	2003	2009	2014
Age	0.049***	0.050***	0.069***	0.061***	0.059***
	(0.007)	(0.014)	(0.009)	(0.005)	(0.008)
Age^2	−0.001***	−0.001***	−0.001***	−0.001***	−0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Children 0-5	−0.022	−0.059**	−0.042***	−0.085***	−0.079***
	(0.015)	(0.024)	(0.011)	(0.016)	(0.015)
Children 6-14	−0.023***	−0.032***	−0.028**	−0.035***	−0.044***
	(0.008)	(0.012)	(0.013)	(0.010)	(0.013)
Own education: reference = less than primary					
Advanced level	0.285***	0.242***	0.219***	0.138***	0.117***
	(0.015)	(0.024)	(0.027)	(0.022)	(0.014)
University	0.528***	0.539***	0.590***	0.504***	0.512***
	(0.025)	(0.033)	(0.016)	(0.020)	(0.021)
Log HH income per cap	−0.001	−0.028*	0.001	−0.032**	−0.044***
	(0.019)	(0.015)	(0.020)	(0.015)	(0.010)
Male salaried earner	0.008	0.001	−0.053***	−0.038***	−0.033*
	(0.037)	(0.021)	(0.020)	(0.012)	(0.019)
Head's education: reference = less than primary					
Primary	−0.126	0.174*	−0.026	−0.055	−0.159**
	(0.102)	(0.096)	(0.139)	(0.088)	(0.062)
Lower secondary	−0.106	0.136	0.011	−0.037	−0.069
	(0.139)	(0.085)	(0.147)	(0.075)	(0.057)
Middle secondary	−0.076	0.175**	0.005	−0.072	−0.096*
	(0.100)	(0.084)	(0.139)	(0.080)	(0.053)
Ordinary level	−0.084	0.175**	−0.013	−0.050	−0.062
	(0.116)	(0.078)	(0.139)	(0.068)	(0.059)
Advanced level	−0.169	0.185**	0.004	−0.052	−0.089
	(0.103)	(0.089)	(0.154)	(0.075)	(0.057)
University	−0.126	0.069	0.013	0.001	−0.012
	(0.106)	(0.100)	(0.114)	(0.065)	(0.066)
Ethno-religious group: reference = Sinhalese buddhist					
Sri Lankan Tamil	−0.180***	−0.150***	−0.179***	−0.156***	−0.124***
	(0.066)	(0.033)	(0.035)	(0.044)	(0.048)
Indian Tamil	−0.139	−0.086	0.055	0.136	0.138
	(0.126)	(0.186)	(0.106)	(0.086)	(0.085)
Muslim	−0.054	−0.143***	−0.141**	−0.200***	−0.226***
	(0.054)	(0.041)	(0.058)	(0.034)	(0.043)
Other ethno-rel	0.020	0.003	−0.001	0.006	−0.073**
	(0.035)	(0.021)	(0.027)	(0.030)	(0.032)

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Table A.6 – *Continued from previous page*

District employment shares: reference = Agriculture					
Manufacturing	-0.502^{***}	-0.172	-1.071^{***}	-1.367^{***}	0.471
	(0.076)	(0.334)	(0.374)	(0.146)	(0.720)
Trade, construction	-0.159	0.598^{**}	0.940^{**}	-0.227^{**}	-1.429^{***}
	(0.099)	(0.260)	(0.450)	(0.103)	(0.396)
Public, professional	0.852^{***}	-0.426	1.098^{**}	2.044^{***}	1.680^{***}
	(0.250)	(0.856)	(0.468)	(0.685)	(0.573)
High education share	-2.388^{***}	-1.841^{**}	-3.207^{***}	-1.159^{***}	0.325
	(0.335)	(0.891)	(0.821)	(0.268)	(0.706)
Unemployment	0.891^{***}	-3.034^{***}	-3.974^{**}	0.325	-0.182
	(0.214)	(1.128)	(1.897)	(0.311)	(0.720)
Province: reference = Western					
Central	0.013	-0.003	-0.105	-0.048^{**}	0.131^{*}
	(0.011)	(0.039)	(0.084)	(0.019)	(0.070)
Southern	0.007	-0.006	0.086^{*}	-0.004	0.031
	(0.013)	(0.026)	(0.046)	(0.028)	(0.059)
Northwestern	0.016	-0.135^{**}	-0.075	0.059^{***}	-0.006
	(0.017)	(0.064)	(0.059)	(0.019)	(0.039)
Northcentral	0.022	-0.118	-0.017	-0.086^{***}	-0.101
	(0.029)	(0.098)	(0.099)	(0.033)	(0.115)
Uva	-0.037^{**}	0.079	0.104	0.082	0.003
	(0.017)	(0.065)	(0.079)	(0.063)	(0.122)
Sabaragamuwa	-0.066^{***}	-0.134^{**}	-0.061	0.024	0.017
	(0.015)	(0.064)	(0.052)	(0.029)	(0.069)
R^2	0.107	0.095	0.133	0.128	0.135
Observations	3702	3139	2979	3556	4340

Marginal effects; district-clustered robust standard errors in parentheses

Marginal effect for dummy variables is the discrete change from reference category.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$