UNITED NATIONS UNIVERSITY
UNU-WIDER

WIDER Working Paper 2021/186

Maternal employment and children's outcomes

Evidence from Indonesia

Ervin Dervisevic,[1] Maria C. Lo Bue,[2] and Elizaveta Perova[1]

December 2021

United Nations University World Institute for Development Economics Research
wider.unu.edu

Abstract: Is maternal employment beneficial or harmful for child development? Maternal employment generates income, which is needed to provide core inputs for children's health and education. However, maternal employment comes at the cost of time spent with children, which is also a critical input into children's development. The net impact is therefore theoretically ambiguous. Maternal employment, through mothers' exposure to wider social networks and greater bargaining may also be associated with *how* the family uses income. In this paper, we estimate the causal impact of maternal employment on several measures of children's health and education in Indonesia. We mobilize several data sources to construct a dataset of more than 32,000 observations of children aged 6 to 18 and employ a two-stage least squares strategy exploiting exogenous changes in tariffs on female-intensive sectors. We find that maternal employment significantly improves both education and health outcomes.

Key words: child development, maternal employment, Indonesia

JEL classification: D1, J13, J22, O15

Acknowledgements: The authors acknowledge the financial support of the United Nations University World Institute for Development Economics Research (UNU-WIDER), Umbrella Facility for Gender Equality Trust Fund and Australia's Department of Foreign Affairs and Trade (DFAT).

[1] World Bank, Washington DC, USA, corresponding author: edervisevic@worldbank.org; [2] University of Bari, Bari, Italy

This study is published within the UNU-WIDER project Women's work – routes to economic and social empowerment.

Information and requests: publications@wider.unu.edu

ISSN 1798-7237 ISBN 978-92-9267-126-6

https://doi.org/10.35188/UNU-WIDER/2021/126-6

Typescript prepared by Lesley Ellen.

United Nations University World Institute for Development Economics Research provides economic analysis and policy advice with the aim of promoting sustainable and equitable development. The Institute began operations in 1985 in Helsinki, Finland, as the first research and training centre of the United Nations University. Today it is a unique blend of think tank, research institute, and UN agency—providing a range of services from policy advice to governments as well as freely available original research.

The Institute is funded through income from an endowment fund with additional contributions to its work programme from Finland, Sweden, and the United Kingdom as well as earmarked contributions for specific projects from a variety of donors.

Katajanokanlaituri 6 B, 00160 Helsinki, Finland

1 Introduction

The question about the impact of maternal employment on child development outcomes has been attracting the attention of researchers for several decades, resulting in a plethora of studies which predominantly focus on developed countries. These studies cover a wide range of child development outcomes, from cognitive development, measured through performance on standardized tests (Baum 2003; Bernal 2008; Bernal and Keane 2010, 2011; Del Boca et al. 2014; Gregg et al. 2005; Verropoulou and Joshi 2009; Waldfogel et al. 2002), to education, measured through the likelihood of achieving at least A-levels (Ermisch and Francesconi 2013), secondary track attendance (Schildberg-Hoerisch 2011), graduating from a university (Mosca et al. 2017) or school tests (Ruhm 2008), to health, measured using parents' reports of child health (Gennetian et al. 2010; Page et al. 2019), overweight (Anderson et al. 2003), and incidence of adverse events such as accidents or asthma episodes (Morrill 2011).

This rich literature, however, has not forged a consensus: the results cover the full spectrum of impacts from being negative (for example, Baum 2003; Bernal 2008) to null (e.g. Verropoulou and Joshi 2009) to positive for some types of work and groups of children (for example, Ruhm (2008) finds that limited market work benefits relatively disadvantaged children in the USA; Waldfogel et al. (2002) find that maternal work during the second and third years of life is beneficial for non-Hispanic white children, also in the USA).

Although most studies, especially those based on the US data, find negative impacts, findings vary by outcome, country, socio-economic status, age, type of work, and care arrangements which replace maternal care. For example, Bernal and Keane (2011) find negative impacts for children in informal care and no adverse impacts for children in institutional care in the USA. Gregg et al. (2005) find that maternal full-time work has adverse effects for children under 18 months of age but that part-time work and work after 18 months is not harmful in the UK. This wide heterogeneity depending on the context points to the importance of further investigation. Indeed, the type of maternal work and childcare arrangements which appear to shift the impacts from negative to null to positive can be affected by policy variables such as the length of maternity leave, ages of eligibility for pre-school, costs of childcare services, content of the programmes, how well curated/standardized they are, and so on.

This is particularly important in the context of developing countries. First, differences in institutions, labour market structure, social norms, and service availability will all collide to shape available alternatives for maternal care or shift different groups of children in and out of such alternative care arrangements. Thus, it is not clear a priori which of the developed countries' results are more likely to hold for the developing countries context and for which groups of children. At the same time, the literature on the impacts of maternal labour force participation on children's outcomes is relatively scant in developing countries. Most studies are correlational (Brauner-Otto et al. 2019; Nankinga et al. 2019; Ukwuani and Suchindran 2003). To our knowledge, only four studies employ identification strategies which could produce causal estimates: Pieters and Rawlings (2020) in China, Rashad and Saraf (2019) in Egypt, Reynolds et al. (2017) in Chile, and Afridi et al. (2016) in India.

Second, many developing countries are about to exhaust their demographic dividend and face the problem of ageing, which could be alleviated through increased female labour force participation (World Bank 2016). In this context, a more complete understanding of the wide-ranging implications of increased female labour force participation is a relevant input for policy debate. Increased female labour force participation may have positive impacts on the productivity and

equity of current and future generations. However, we do not fully understand under what circumstances it yields the maximal positive effect and what policy levers are needed to maximize benefits and mitigate potential negative consequences.

Several lower- and middle-income countries in Latin America and the Caribbean have expanded their institutional childcare programmes over the last decades (Halim et al. 2021) and countries in Asia are following suit. Such reforms imply a multitude of decisions about the specifics of implementation, such as number of hours and eligibility age. These programmes can be further combined with policy decisions on maternity leave or flexible work. Better understanding of how maternal work affects child development outcomes in lower- and middle-income countries can provide important inputs for shaping these policies.

Most theoretical frameworks from the literature on developed countries focus on two channels through which maternal employment impacts children's outcomes. First, income is a critical input for children's health (Rosenzweig and Schultz 1983) and education (Becker and Tomes 1979; Leibowitz 1974) but so is maternal time (Del Boca et al. 2014; Del Boca et al. 2016). While maternal employment increases the former, it reduces the latter, leaving the net impact theoretically ambiguous. Notably, Hsin and Felfe (2014), using longitudinal data from the USA, demonstrate that not all parental time is beneficial for children and that, on average, maternal work does not affect beneficial time with children, reducing only non-beneficial (unstructured) time.[1]

In the context of developing countries, several additional channels are likely to be at play. First, an increase in a mother's income is likely to translate into an increase in her bargaining power. Under the assumption that women's preferences—compared to men's—are more inclined towards investment in children's health and education, whether for reasons of altruism or household allocation of responsibilities (Blumberg 1988; Engle 1993; Hoddinott and Haddad 1995; Quisumbing and Maluccio 2003; Thomas 1990), this stronger bargaining power of working mothers will result in higher investment in children's human capital. This hypothesis has been validated by several empirical studies which have shown that an increase in mothers' labour income and asset ownership significantly improves children's education and health (Luke and Munshi 2011; Menon et al. 2014; Qian 2008; van der Muelen Rodgers and Kassens 2018). Lépine and Strobl (2013) directly measure bargaining power and show that it is associated with better nutritional outcomes for children. However, other studies question the importance of this channel, demonstrating that the gender of the recipient of a cash transfer does not matter for children's outcomes (Akresh et al. 2016; Benhassine et al. 2015; Haushofer and Shapiro 2016).

Second, maternal work may bring non-tangible benefits beyond income: for example, through social interactions and better networks created by market work, women may become more exposed to information that is relevant for child rearing. When discussing the relationship between children's outcomes and socio-economic status, Currie (2009) notes that 'lower socioeconomic status is, however, not only a matter of what inputs one can afford to buy, but also a matter of what one can do and chooses to do with the inputs one has at hand'. It is possible that maternal employment affects what the household not only *can do* (due to increased income) but also *chooses to do* (due to exposure to more information and larger social networks).

Lastly, in contexts where household chores are also primarily the responsibility of women, if children's time is the only available substitute for mothers' time, mothers' participation in the labour market may penalize children's educational achievements. Given prevalent gender norms

[1] Notably, while Hsin and Felfe (2014) do not find adverse effects of maternal work, on average, their results suggest that among the working poor and lower-middle class maternal employment is associated with negative impacts for children.

about domestic work, girls are more likely than boys to take over domestic work previously done by mothers.

This study aims to contribute to the literature on the role of maternal employment for children's outcomes in three ways. First, we provide causal estimates in a developing country. While several studies analyse the role of maternal employment, only four employ empirical strategies that allow for identification of causal impacts. Reynolds et al. (2017) and Rashad and Sharaf (2019) rely on instrumental variables, while Pieters and Rawlings (2020) and Afridi et al. (2016) use both instrumental variables and fixed effects. Second, we cover both health and educational outcomes for the same group of children: most studies in developing countries focus either on health (Brauner-Otto et al. 2019; Nankinga et al. 2019; Pieters and Rawlings 2020; Rashad and Sharaf 2019) or educational/cognitive (Afridi et al. 2016; Reynolds et al. 2017) outcomes, rather than covering a wide array of human development outcomes. Lastly, unlike in most studies of developing countries (the only exception is Afridi et al. (2016)), our dataset allows us to explicitly control for contemporaneous household income to isolate this channel from other channels through which maternal employment may affect children's outcomes.

The remainder of the paper is organized as follows. Section 2 describes the Indonesian context, compared to other countries where the relationship between maternal employment and children's development has been analysed, and the data. Section 3 presents our empirical strategy. Section 4 describes the main results, while section 5 provides heterogenous results. Section 6 concludes.

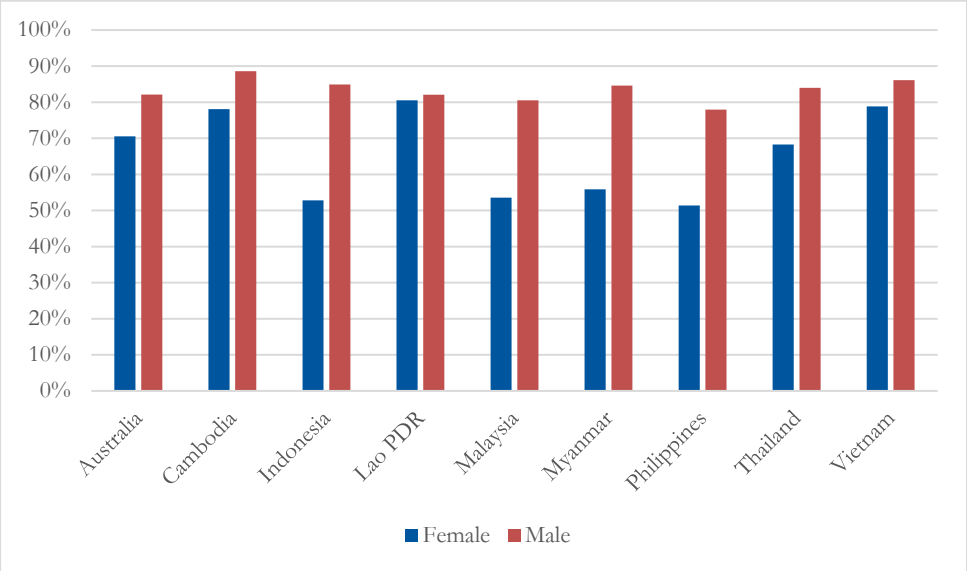
2 Indonesian context and data

Indonesia has a relatively low female labour force participation rate which has barely changed in the last two decades; it increased by 3 percentage points (from 52.8 to 56 per cent), or by 6 per cent, between 2000 and 2019. It is lower than in many neighbouring countries, although the male labour force participation rate is on par with regional neighbours (Figure 1). Indonesia is also on the lower end of the female labour force participation spectrum among the countries where the relationship between maternal work and children's development has been analysed[2] either causally or through correlational analysis, which we reviewed in the introduction (Figure 2).

Schaner and Das (2016) note that near stagnation in the female labour force participation rate in Indonesia may conceal changes in opposite directions for different groups of women: more and less educated, urban, and rural. Schaner and Das (2016) demonstrate a strong U-shaped relationship between women's education and labour force participation in Indonesia. Over the last decades, as education levels have increased on average for lower-educated women, they may be opting out of the labour market, while more-educated women are increasingly likely to work. These dynamics may be partially explained by the type of jobs and childcare options available, which may in turn impact the relationship between maternal work and children's development, as analysed in this paper.

[2] In the remainder of this section, we focus our comparisons of Indonesia to other countries where the current literature has explored the relationship between maternal work and children's outcomes, as reviewed in the introduction.

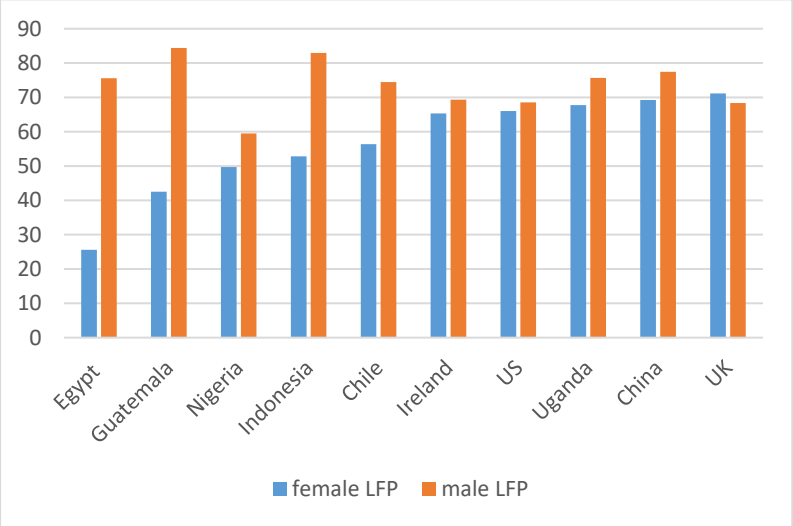
Figure 1: Female and male labour force participation rate by country in East Asia



Note: data is for the year 2014 for all countries.

Source: authors' elaboration based on the World Development database (World Bank 2021).

Figure 2: Female and male labour force participation rates by country in sample of countries where current literature has causally explored the relationship between maternal employment and children's development outcomes



Note: data is for the year 2014.

Source: authors' elaboration based on World Development Indicators database (World Bank 2021).

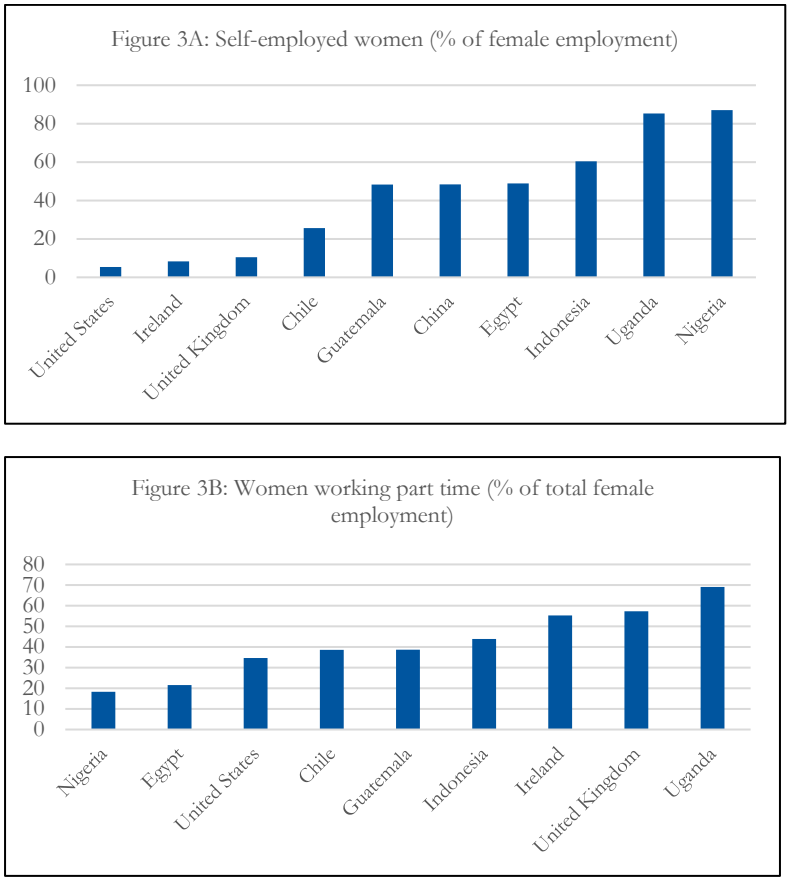
As the literature notes heterogeneity depending on the type of work (e.g. Gregg et al. 2005), we present data on how Indonesia compares to other countries where estimates of the relationship between maternal work and children's development are available in terms of likelihood of self-employment and part-time work (Figures 3A and 3B). Sixty per cent of Indonesian working women are self-employed and 44 per cent work part time. Thus, Indonesia ranks third and fourth highest, respectively, in our sample of countries.

Legislative provisions for maternity and parental leave are likely to affect the relationship between maternal work and children's outcomes. Among studies of the impact of maternal work in the first year of a child's life, analysis based on US data uniformly finds negative impacts (James-Burdumy

2005; Waldfogel et al. 2002). In the UK, Gregg et al. (2005) do not find detrimental impacts, noting that the differences may be due to much more generous provisions of maternity and parental leave in the UK. Indonesia does not have strong legislative support for parents[3] and a significant fraction of its workers are informal, which limits their ability to take advantage of governmental parental leave policies (Figure 4).

Moreover, the provision of and access to institutional childcare have been rather limited. In 1997, the first year of analysis of this study, the pre-school enrolment rate in Indonesia was 19 per cent—well below the world and East Asia and the Pacific (EAP) averages of 29 and 28 per cent, respectively. Several legislative measures, starting in 2003, significantly improved pre-school enrolment by 2014 (the last year analysed in this study). By then, pre-school enrolment had reached 58 per cent, exceeding the world average of 55 per cent, and lagging, albeit by a small margin, the EAP average of 73 per cent (World Bank 2021).

Figure 3: Female rates of self-employment and part-time work, by country

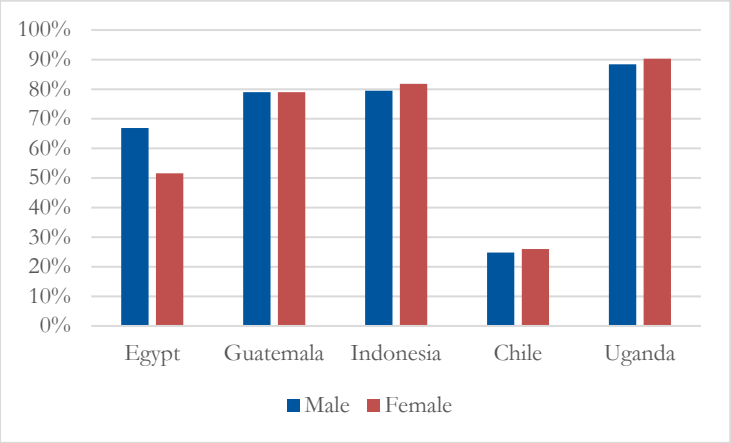


Note: data is for the year 2014.

Source: authors' elaboration based on World Development Indicators (World Bank 2021).

[3] In Indonesia, female workers are entitled to three months of paid maternity leave (Law 13/2003, Article 82). They receive 100 per cent of their wages (Law 13/2013, Articles 82 and 84). In addition to maternity leave, Law 13/2003 provides for paternity leave of two days (Article 83(4)(e)) but the law does not mandate parental leave, whether paid or unpaid (OECD 2019).

Figure 4: Informal employment rates, by country



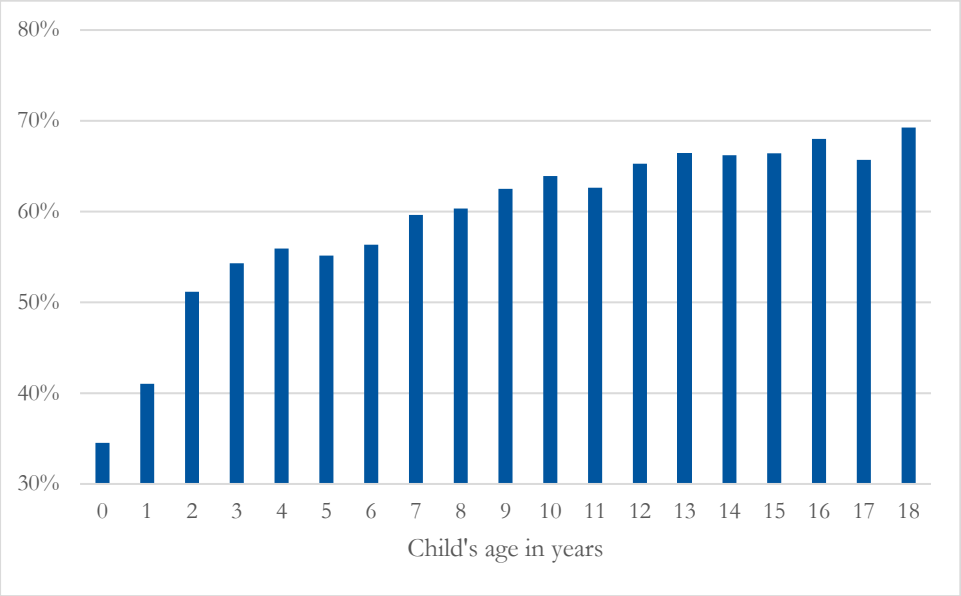
Note: informal employment is defined as having any job in the informal sector, including agriculture, as a percentage of labour force participation. Data is for the latest available year.

Source: authors' elaboration based on ILOSTAT (2021).

In the countries with higher female labour force participation rates and stronger provision of institutional childcare, women typically return to the labour market after their children reach the eligibility age for childcare. Consequently, most studies, especially for developed countries, focus on the first few years of children's lives or the long-term consequences of maternal work during those years. In contrast, in Indonesia, the return to the labour market appears to be spread more across the ages of the youngest children. Figure 5 shows that while the majority of mothers withdraw from the labour market during the first two years of their children's lives, their return to the labour market is spread through early and middle childhood and adolescence. Consequently, in our study we focus on the contemporaneous impacts of maternal employment: we estimate the impact of maternal work in a specific year on children's outcomes in the same year for a group of children aged 6 to 18, as a uniform set of health and education outcomes is available for this age group.[4]

[4] In a follow-up paper, we explore the impacts of maternal work on children aged 0–5, with a different set of outcomes. (Please contact the authors for details of this paper.)

Figure 5: Maternal employment by child's age (%)



Note: sample includes all women of childbearing age at time of birth (age 15–45).

Source: authors' elaboration based on IFLS data (RAND 2020).

We use three sources of data: four waves of the Indonesian Family Life Survey (IFLS) conducted in the period 1997–2015 (RAND 2020), Indonesian National Labour Force Survey (SAKERNAS) conducted in 1995 (BPS 1995), and data on Indonesian import tariffs in the period 1995–2015 (UN Comtrade 2021). We draw our main outcomes from the IFLS data, which includes a rich set of variables that capture children's health and schooling outcomes (Table 1). Health outcomes include haemoglobin, lung capacity, height for age, and weight for age, based on which we define indicators for stunting and wasting. Schooling outcomes include years of schooling, a binary indicator for currently being enrolled in school, and a variable which captures whether current schooling corresponds to that expected for the age of the child.[5]

We carry out estimations on two samples. The first sample includes children whose fathers were present in the household. We can observe fathers' characteristics, such as age and education. For approximately 8 per cent of children in our dataset, fathers are not present. Table 1 shows descriptive statistics for both samples (children with fathers present and all children), as well as for children with absent fathers separately. Children with absent fathers fare somewhat worse than children in the households where both parents are present, at least in some dimensions: for example, they are a bit shorter and are less likely to be enrolled in school. About 26 and 9 per cent of all children in our sample are stunted and wasted, respectively. The IFLS is not nationally representative: it covers 13 (out of 27) provinces, which are home to 83 per cent of Indonesia's population, and it prioritizes rural areas. Notably, stunting and wasting rates in the IFLS are consistent with the estimates based on nationally representative data, such as the Riskesdas survey.[6] For instance, Shrimpton and Rokx (2013), based on Riskesdas survey data, report that in 2010 the

[5] We construct this variable as 'age in years—years of schooling— 6'. For a child who is on track, the variable is equal to 0.

[6] Riskesdas (Riset Kesehatan Dasar: Basic Health Research) is a repeated cross-sectional study conducted by the Indonesian National Institute of Health Research and Development (NIHRD) of the Ministry of Health every five years since 2007. The data, which includes 300,000 households residing in all 497 districts and is thus nationally representative, has been largely used by researchers to produce indicators of health and nutritional outcomes for the Indonesian population.

stunting and wasting rates for children aged 6 to 18 were 33.9 per cent and 10.4 per cent respectively.

Table 1: Summary statistics for four waves of IFLS surveys

	Sample with father present		Sample with father absent		Pooled sample	
	Mean	SD	Mean	SD	Mean	SD
Female child	0.486	0.5	0.487	0.5	0.486	0.5
Child age	11.56	3.68	11.813	3.76	11.581	3.69
Mother age	38.103	6.98	38.61	7.77	38.145	7.05
Mother attended high school or above	0.396	0.49	0.381	0.49	0.394	0.49
Mother attended college/university	0.021	0.14	0.022	0.15	0.021	0.14
Caretaker is mother	0.687	0.46	0.619	0.49	0.681	0.47
Father present	1	0	0	0	0.918	0.28
Father age	43.101	8.26	0	0	39.546	14.26
Father attended high school or above	0.463	0.5	0	0	0.424	0.49
Father attended college/university	0.028	0.16	0	0	0.025	0.16
Household (HH) size	5.421	1.81	4.91	2.11	5.378	1.84
At least one grandparent in HH	0.217	0.41	0.382	0.49	0.23	0.42
Rural location	0.496	0.5	0.52	0.5	0.498	0.5
HH income per capita (billion Rp)	0.006	0.02	0.005	0.03	0.006	0.02
HH income per capita sq (billion Rp)	0.001	0.01	0.001	0.01	0.001	0.01
Mother employment:						
Mother in any employment	0.63	0.48	0.718	0.45	0.637	0.48
Mother in a primary job in the private sector	0.127	0.33	0.221	0.41	0.135	0.34
Mother in a primary job as self-employed	0.266	0.44	0.342	0.47	0.272	0.45
Mother in a primary job as a casual worker	0.032	0.18	0.056	0.23	0.034	0.18
Mother in a primary job as a family worker	0.171	0.38	0.072	0.26	0.163	0.37
Mother in a primary job as a government worker	0.033	0.18	0.027	0.16	0.033	0.18
Child outcomes:						
Height for age	-1.331	1.32	-1.351	1.27	-1.333	1.31
Stunted child	0.261	0.44	0.277	0.45	0.262	0.44
Wasted child	0.09	0.29	0.103	0.3	0.091	0.29
Haemoglobin	12.641	1.51	12.666	1.55	12.643	1.51
Lung capacity	277.556	93.42	280.218	93.25	277.773	93.4
Years of schooling	4.776	3.38	4.782	3.36	4.776	3.38
Enrolled in school	0.842	0.36	0.785	0.41	0.838	0.37
Age and schooling	0.845	1.55	1.107	1.81	0.866	1.57
Observations	29,557		2,657		32,214	

Note: sample includes children with mothers aged 15-45 years at the time of the birth of the child. Father variables are zero for father absent from the household, and income is winsorized at 99%.

Source: authors' elaboration based on IFLS data (RAND 2020).

The IFLS survey also contains data on maternal work participation. Our primary independent variable of interest is a binary indicator for maternal employment which includes private wage work, work for a governmental institution, self-employment, unpaid family work, and casual work. Sixty-four per cent of mothers work (63 per cent in households where fathers are present and 72 per cent in households without a father). This number is higher than the national average, possibly because the women in our sample are aged 21 to 63 (15 to 45 at the time of the child's birth), as opposed to 15 to 65, which is typically used for the analysis of labour market engagement. The labour force participation rate is also higher in rural than in urban areas, and rural areas have been prioritized during the sampling of IFLS data. Among all mothers from the households with fathers

present, 13 per cent work in the private sector, 27 per cent are self-employed, 3 per cent are governmental workers, 3 per cent are casual workers, and 17 per cent report working as unpaid family workers. Women who live in households without a father present are more likely to work in the private sector or be self-employed (22 and 34 per cent, respectively) and less likely to be unpaid family workers (7 per cent).

The IFLS allows us to include a rich set of controls in our analysis. These include gender and age of the child, maternal age, maternal education, dummy variables for whether the mother is a primary caretaker, whether at least one grandparent is present in the household, a rural indicator, as well as household income and its square. For the sample that only includes mothers in the households where fathers are present, we also control for fathers' education and age. In the analysis of the full sample, we interact an indicator for fathers' presence with fathers' characteristics.

We use four rounds of IFLS data, collected in 1997, 2000, 2007–08, and 2014–015, to construct a dataset with 29,557 observations for the sample of children living in households with both the mother and father present and 32,214 observations in the larger sample with children from households with only the mother present. Although the IFLS is a panel, because the dataset spans 18 years and some rounds of data collection are six to seven years apart, we treat it as a repeated cross-section. Treating it as a panel would necessitate limiting the sample to children who were very young at the first round of IFLS and who, therefore, were observed several times as children. This would significantly reduce the sample size.

We complement the IFLS data with data on Indonesian tariffs from the UN Comtrade Database and sectoral employment by gender from the National Labour Force Survey (SAKERNAS) to construct an instrumental variable for maternal employment. The UN Comtrade Database includes annual data on Indonesian tariffs by sector. It is available for the period from 1995 to 2015, but for the purposes of our analysis we use the years that match the four IFLS waves: 1997, 2000, 2007–08, and 2014–15. We use SAKERNAS 1995 to construct the shares of women working in different sectors prior to tariff reduction. SAKERNAS was started in 1976 to collect data on the labour market characteristics of a nationally representative sample of all working-age individuals and has been conducted annually since 1986. In the SAKERNAS data, agricultural and manufacturing employment is categorized into 16 groups and we aggregate import tariff data based on the same grouping.

3 Empirical strategy

The empirical identification of the effect of maternal employment on children's outcomes is complicated by the endogeneity of the maternal decision to enter the labour market. Indeed, the mother's decisions to work or stay at home and where and how much to work are likely correlated with factors which may not be observable by the researchers and which affect children's development.

For example, children's health conditions or educational achievements may influence mothers' labour supply decisions: mothers of unhealthy children or of children who are not doing well at school may choose to leave or reduce employment in order to provide the necessary care and time for their children's needs. The direction of the effect is, however, uncertain. Alternatively, having a child with poor health or with poor learning outcomes may also require additional income to pay for health or education expenditures, hence positively affecting the maternal labour supply.

Other unobservable factors may include mothers' characteristics, such as motivation, productivity, ability, and personality traits, which may be correlated with children's endowments or the parenting style, both of which likely affect observable outcomes. For example, if participation in the labour market is positively correlated with higher ability and ability is genetically inherited, then children from high-ability mothers, who are more likely to work, will have better outcomes, therefore leading to upward-biased estimates of the effects of maternal work.

To address the endogeneity of maternal employment, we rely on an instrumental variables approach. Specifically, we take advantage of the exogenous reduction in import tariffs in Indonesia, which may affect a woman's employment prospects differently across time and depending on the composition of employment in the district where she lived prior to introduction of the tariff.

Between 1995 and 1999, Indonesia entered two rounds of trade liberalization that resulted in tariff reductions across several products and industries.[7] However, tariffs introduced at the same time will affect districts differently depending on the pre-liberalization sectoral employment there. For example, a district in which the manufacture of beverages is the dominant sector in terms of employment will be more exposed to changing import tariffs on beverages and inputs in beverages production compared to a district where agriculture is the main sector of employment. In turn, individual women's employment prospects will be more affected if beverage-producing sectors traditionally employ higher shares of women. Indeed, Kis-Katos et al. (2018) demonstrate that a decrease in import tariffs in Indonesia contributed to an increase in female labour force participation through a relative expansion of more female-intensive sectors.

We also include a rich set of control variables which may simultaneously affect maternal labour supply decisions and children's outcomes. Of particular importance, especially in developing countries, is household income. Women from lower-income families may not have a choice of whether to work or not, and low resources, even with income from mothers' work, may affect children's outcomes. Some papers based on data for developing countries control for household wealth (Brauner-Otto et al. 2019; Rashad and Sharaf 2019). However, mothers may also enter the labour market in response to shocks, such as illness of a breadwinner or a bad crop, which are likely to also have a direct impact on children. Maternal earnings may offset some of these negative impacts but, potentially, at the expense of a lower investment of time in children's development, leaving the net effect ambiguous.

Notably, as maternal work may be facilitated through public investment in institutional childcare, it raises questions whether such investments would be optimal. Abstracting from other potential benefits of increased women's labour market participation, purely from the standpoint of children's welfare, would it be optimal to use limited public resources to enable maternal work? Or would channelling resources to vulnerable families in other ways, for instance, through strengthening safety nets and social protection mechanisms, result in better children's outcomes? Therefore, providing estimates of the impact of maternal work, net of additional resources that it brings, is relevant for policy design. The IFLS data allows us to control for contemporaneous household income which includes maternal earnings and to estimate the impact of maternal work on children's outcomes, net of the income effect.

[7] Specifically, Indonesia entered a first wave of tariff reduction in late 1994 following the obligations prescribed in the Uruguay Round. In 1999, tariffs were further reduced as part of the International Monetary Fund's conditionality package. As reported in Kis-Katos and Sparrow (2015) and Kis-Katos et al. (2018), the applied tariffs declined, on average, from 17.2 per cent in 1993 to 6.6 per cent in 2002.

Specifically, we estimate

$$y_{ijkt} = \delta_k + \mu_t + \beta MotherEmployed_{jkt} + \gamma X_{ijkt} + \varepsilon_{ijkt}$$

where y_{ijkt} is a health or educational outcome for child *i* of mother *j* in district *k* in year *t*. The main variable of interest is $MotherEmployed_{jkt}$, which has a value of one if mother *j* from district *k* is employed in year *t*, while X_{ijkt} is a set of child, mother, and household characteristics, including household income and household income squared. Other control variables include child's gender and age, mother's age, indicator variables for mother's education (dummy for attending at least high school and dummy for attending university), an indicator variable for whether the mother is the child's primary caretaker, an indicator for rural location and for the presence of at least one grandparent in the household, and an indicator for whether a child's father is present in the household. For households where fathers are present, we include father's age and education (dummies for attending high school and university). We do not observe these variables for households where fathers are not present.

We use the sample of children from all households with fathers either present or absent as our primary sample. In this sample, we interact the indicator for the presence of a father with father's characteristics, effectively setting them to zero for the children in households where fathers are not present. The results based on the sample where fathers are present (92 per cent of all children) are very similar. Given the large number of children's outcomes provided in the IFLS data, we follow Kling et al. (2007) to construct z-scores for health and educational outcomes to address the possible multiple hypothesis problem.[8] We use district δ_k and yearly μ_t fixed effects to control for environmental and temporal changes, while ε_{ijkt} are residuals.

To address the endogeneity of maternal employment, we instrument it with the average change in input tariffs, weighted by sectoral share of female employment:

$$MotherEmployed_{jkt} = \delta_k + \mu_t + \theta \Delta Tariff_{kt} + \mu X_{ijkt} + \varphi_{ijkt}$$

where, following Kis-Katos et al. (2018), we use data from the UN Comtrade Database and SAKERNAS labour force survey to construct $\Delta Tariff_{kt}$, a weighted average of changes in tariffs between 1995, when liberalization started, and the time at which maternal employment outcomes were measured. Specifically, we calculate:

$$\Delta Tariff_{kt} = \sum_{s=1}^{S} \left(\frac{Fem_{sk1995}}{Empl_{k1995}} (Tariff_{st} - Tariff_{s1995})\right)$$

$(Tariff_{st} - Tariff_{s1995})$ is a change in the average import tariff for sector *s* from 1995 till year *t* (with t=1997, 2000, 2007, 2008, 2014, 2015), Fem_{sk1995} is the number of women employed in sector *s* of district *k* in 1995, and $Empl_{k1995}$ is total employment in district *k* in 1995. This weighted change in import tariffs summarizes the exposure to exogenous change in tariffs for the sectors in which women were likely to be employed in year *t* in district *k*. We follow Kovak (2013) in excluding non-tradable sectors from the computation of weights.

[8] Following Kling et al. (2007), we construct the indices by calculating z-scores for each component of the index, having recoded them so that an increase in numerical value is associated with better development outcomes. We then average the z-scores.

This instrument is strongly correlated with the likelihood of maternal employment: the first-stage F-statistic is over 10 and around 50 in most regressions, depending on the outcome and specification. It also plausibly satisfies exclusion restriction; while it changes the likelihood of maternal work, district-level changes in tariffs, conditional on district and time fixed effects which proxy district economic conditions and over-time changes in overall economic development, are unlikely to affect children's education and health directly. However, the expansion of employment opportunities generated by the tariff reductions may also affect children's education and health through an increase in child labour. We check whether this is true by running several ordinary least squares (OLS) regressions of child employment on our tariff instrument. The results, reported in Table A1 in the Appendix, show no effect of our tariff instrument on child labour. Thus, we consider our instrument valid and interpret our estimates as causal impacts of maternal work on children's development outcomes, net of income effect.

4 Main results

We first focus on the overall impacts of maternal work on broad aspects of children's development: health (Table 2) and education (Table 3), captured in Kling, Katz, and Liebman (KKL) z-score indices based on Kling et. al. (2007) constructed using several variables described in the previous section. Both tables contrast OLS and two-stage least squares (2SLS) estimates. We also subsequently expand the set of control variables: columns 1 and 4 only include two controls for child's gender and age. We add household, maternal, and paternal characteristics in columns 2 and 5. Columns 3 and 6 further expand the set of controls to include contemporaneous household income and income squared.

The OLS regressions, which do not address the endogeneity of maternal employment, suggest a negative association between maternal work and child's health (Table 2, columns 1–3). Instrumenting maternal work with the change in tariffs reverses the sign of the estimate and changes its magnitude (Table 2, columns 3–6). The 2SLS results suggest that maternal employment has a positive effect, increasing the KKL index by 0.68, or 1.16 of its standard deviation, in our preferred specification—with contemporaneous household income included. In the case of the KKL index for education, both the OLS and 2SLS estimates suggest a positive relationship between maternal work and children's educational outcomes. However, the 2SLS estimates are approximately four times higher than the OLS estimates: maternal employment increases the KKL index for schooling by 1.31 of its standard deviation.

Inclusion of observable characteristics, beyond the child's age and gender, reduces the magnitude of standard error relative to the magnitude of coefficients for both specifications. In the case of OLS, the coefficient on maternal employment increases in magnitude and becomes significant. In the case of the 2SLS regressions, the coefficient on maternal employment is positive and significant in all specifications but the magnitude of the coefficients increases as we include controls.

It is worth noting that the change in magnitude due to the inclusion of contemporaneous income and its square is small; the OLS estimate of the association between maternal work and the health index increases by 0.2 percentage points, or 12 per cent of the coefficient without income included, whereas the 2SLS estimate increases by 0.6 percentage points, or around 1 per cent. The dynamics are somewhat different in the case of regressions of the KKL index of schooling outcomes on maternal work; inclusion of income reduces the magnitude of both the OLS and 2SLS coefficients, but by a similarly small margin.

It is plausible that temporal changes in household income play a relatively small role in children's health and education compared to longer-term determinants of welfare such as parental education. Alternatively, these estimates are consistent with a hypothesis that in Indonesia maternal work predominantly affects children not through income but through other channels, such as broader social networks or maternal empowerment.

Table 2: OLS and 2SLS regressions for z-scores of health outcomes

	OLS regressions			2SLS regressions		
	Z-score of health	Z-score of health	Z-score of health	Z-score of health	Z-score of health	Z-score of health
Mother employed	-0.015	-0.017*	-0.019**	0.625**	0.680**	0.686**
	(0.01)	(0.01)	(0.01)	(0.25)	(0.28)	(0.27)
Female child	-0.211***	-0.209***	-0.209***	-0.214***	-0.213***	-0.213***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Child age	0.012***	0.007***	0.008***	0.007***	0.007***	0.007***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Mother age		0.004***	0.004***		0.002	0.002
		(0.00)	(0.00)		(0.00)	(0.00)
Mother attended high school or above		0.084***	0.081***		0.093***	0.093***
		(0.01)	(0.01)		(0.01)	(0.01)
Mother attended college/university		0.094***	0.087***		-0.076	-0.080
		(0.03)	(0.03)		(0.08)	(0.07)
Mother is caretaker		-0.018	-0.018		-0.008	-0.007
		(0.01)	(0.01)		(0.01)	(0.01)
Father present		0.005	-0.003		0.068	0.066
		(0.04)	(0.04)		(0.05)	(0.05)
Father age		0.000	0.000		-0.000	-0.000
		(0.00)	(0.00)		(0.00)	(0.00)
Father attended high school or above		0.056***	0.053***		0.089***	0.089***
		(0.01)	(0.01)		(0.02)	(0.02)
Father attended college/university		0.105***	0.101***		0.096***	0.095***
		(0.02)	(0.02)		(0.03)	(0.03)
At least one grandparent in household (HH)		0.042***	0.041***		0.012	0.012
		(0.01)	(0.01)		(0.02)	(0.02)
HH size		-0.019***	-0.019***		-0.010**	-0.010**
		(0.00)	(0.00)		(0.00)	(0.00)
Rural location		-0.055***	-0.054***		-0.080***	-0.080***
		(0.01)	(0.01)		(0.02)	(0.02)
HH income per capita (billion Rp)			2.452***			0.756
			(0.49)			(0.80)
HH income per capita squared (billion Rp)			-8.652***			-2.981
			(1.99)			(2.74)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
District dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	22,222	22,222	22,222	22,222	22,222	22,222
F-stat (first stage)				32.56	27.33	28.86

Note: observations with any missing values among the five health variables are excluded. Robust standard errors in parentheses. * p<0.1 ** p<0.05 *** p<0.01.

Source: authors' elaboration based on IFLS data (RAND 2020), SAKERNAS 1995 (BPS 1995), and Indonesian import tariffs (UN Comtrade 2021).

Table 3: OLS and 2SLS regressions for z-scores of schooling outcomes

	OLS regressions			2SLS regressions		
	Z-score of schooling	Z-score of schooling	Z-score of schooling	Z-score of schooling	Z-score of schooling	Z-score of schooling
Mother employed	0.009	0.027***	0.025***	0.822***	0.939***	0.932***
	(0.01)	(0.01)	(0.01)	(0.22)	(0.23)	(0.23)
Female child	0.095***	0.095***	0.095***	0.091***	0.090***	0.090***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Child age	0.021***	0.050***	0.050***	0.015***	0.048***	0.048***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Mother age		-0.001	-0.002		-0.005***	-0.005***
		(0.00)	(0.00)		(0.00)	(0.00)
Mother attended high school or above		0.158***	0.157***		0.174***	0.175***
		(0.01)	(0.01)		(0.01)	(0.01)
Mother attended college/university		0.039*	0.034		-0.159***	-0.155***
		(0.02)	(0.02)		(0.06)	(0.05)
Mother is caretaker		0.234***	0.234***		0.245***	0.244***
		(0.01)	(0.01)		(0.01)	(0.01)
Father present		0.059	0.054		0.137***	0.138***
		(0.04)	(0.04)		(0.05)	(0.05)
Father age		-0.001	-0.001		-0.002	-0.002*
		(0.00)	(0.00)		(0.00)	(0.00)
Father attended high school or above		0.182***	0.180***		0.219***	0.220***
		(0.01)	(0.01)		(0.01)	(0.01)
Father attended college/university		0.113***	0.110***		0.099***	0.100***
		(0.02)	(0.02)		(0.03)	(0.03)
At least one grandparent in household (HH)		0.026***	0.026***		-0.011	-0.010
		(0.01)	(0.01)		(0.01)	(0.01)
HH size		-0.023***	-0.022***		-0.012***	-0.013***
		(0.00)	(0.00)		(0.00)	(0.00)
Rural location		-0.071***	-0.071***		-0.101***	-0.101***
		(0.01)	(0.01)		(0.01)	(0.01)
HH income per capita (billion Rp)			1.812***			-0.687
			(0.44)			(0.77)
HH income per capita squared (billion Rp)			-6.547***			1.920
			(1.73)			(2.66)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
District dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	31,676	31,676	31,676	31,676	31,676	31,676
F-stat (first stage)				61.46	55.88	58.05

Note: observations with any missing values among the three schooling variables are excluded. Robust standard errors in parentheses. * p<0.1 ** p<0.05 *** p<0.01.

Source: authors' elaboration based on IFLS data (RAND 2020), SAKERNAS 1995 (BPS 1995), and Indonesian import tariffs (UN Comtrade 2021).

Having established the overall impact of maternal work on health and education outcomes, we proceed to analyse specific components of the KKL index: five health variables, and three schooling variables. Table 4 presents the impacts of maternal work on individual components of the health and education index, respectively. To address the multiple hypothesis testing problem, we calculate the false discovery rate (FDR) q-ratios, which we present in the lower rows of the table. We find statistically significant impacts on individual components of the health and education indices, which are robust to checking the FDR. Indeed, our results suggest that maternal

work increases the height for age and haemoglobin and reduces stunting. All the coefficients withstand the FDR q-values correction and remain significant. Similarly, our estimates suggest that maternal work increases years of schooling and the likelihood of being enrolled and lowers the age and schooling indicator—all components of higher educational achievement, and with sufficiently low q-values to maintain significance with the FDR correction.

Table 4: 2SLS with individual health and schooling outcomes for children aged 6-18 years

	Height for age	Stunted child	Wasted child	Haemo-globin	Lung capacity	Years of schooling	Enrolled in school	Age and schooling
Mother employed	0.837**	-0.540***	0.043	1.640***	2.527	1.660***	0.334***	-1.660***
	(0.36)	(0.15)	(0.08)	(0.48)	(25.64)	(0.46)	(0.11)	(0.46)
Female child	-0.003	-0.003	-0.037***	-0.631***	-54.251***	0.200***	0.006	-0.200***
	(0.01)	(0.01)	(0.00)	(0.02)	(0.87)	(0.02)	(0.00)	(0.02)
Child age	-0.049***	0.011***	-0.000	0.162***	20.388***	0.860***	-0.003***	0.140***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.23)	(0.00)	(0.00)	(0.00)
All mother and family controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
District dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	30,928	30,928	30,864	29,679	22,824	31,676	32,214	31,676
F-stat (first stage)	55.56	55.56	56.35	51.75	32.37	58.05	58.91	58.05
Mother employed (FDR q-val)	0.035	0.001	0.742	0.002	0.921	0.000	0.002	0.000

Note: FDR q-values are computed separately for five health outcomes and three education outcomes. Mother and family controls: mother age, mother attended high school/above, mother attended college/university, mother is caretaker, father present, father age, father attended high school/above, father attended college/university, at least one grandparent in household, rural location, household income (billion Rp), and household income squared (billion Rp). Robust standard errors in parentheses. * p<0.1 ** p<0.05 *** p<0.01.

Source: authors' elaboration based on IFLS data (RAND 2020), SAKERNAS 1995 (BPS 1995), and Indonesian import tariffs (UN Comtrade 2021).

5 Heterogeneous impacts

Having established the positive impact of maternal work on children's welfare outcomes, we explore whether these effects differ by children's age and gender as well as across rural and urban areas.

First, we run two separate sets of regressions for the sub-samples of younger (aged 6–12) and older (aged 13–18) children. The effect of maternal employment on children's educational achievements can indeed be very different at different ages. While maternal time plausibly matters more during the earliest years of schooling, older children may benefit relatively more from the additional income resources brought by maternal employment. Likewise, some differences in the magnitude or significance of the effect of maternal employment can also be expected when considering health and nutritional outcomes at different stages of development. More precisely, considering that the health status of younger children is relatively more vulnerable and that the child growth process is only completed with adolescence, measures of nutritional outcomes such as height for age, stunting, and wasting among younger children are more likely to be influenced by the provision of the time and income resources brought by working mothers.

Our results, shown in Table 5, indicate that some differences emerge when comparing the magnitude and statistical significance of the effect of maternal employment across the two age

groups. Among observations in the youngest age group, the health KKL index of children of working mothers is 1.05 standard deviations significantly higher than that of the children of non-working mothers. Conversely, the effect on older children's health is not statistically different from zero. Considering educational outcomes, the magnitude of the effect among children aged 13–18 is 41 per cent larger than for younger children. Testing for the equality of the coefficients, however, suggests that these differences are not statistically significant.[9]

We further test whether significant gender differences emerge. In Indonesia, as shown by Kevane and Levine (2003), there is no 'missing girls' problem, unlike in other countries in East and South Asia. Moreover, parental allocation of nutrition is not discriminatory and discriminatory educational treatment has significantly reduced since the 1990s. Some research (see, for example, Asian Development Bank 2006) points to an educational gender gap that penalizes boys, which is partly explained by the higher returns to schooling (at later stages of education) for women compared to men (Deolalikar 1993).

Table 5: 2SLS regressions for different age groups

	Children aged 6–12		Children aged 13–18	
	Z-score of health	Z-score of schooling	Z-score of health	Z-score of schooling
Mother employed	0.616*	0.657***	0.663	1.110**
	(0.34)	(0.23)	(0.41)	(0.47)
Female child	-0.006	0.107***	-0.372***	0.068***
	(0.01)	(0.01)	(0.01)	(0.02)
Child age	0.070***	0.143***	0.035***	-0.031***
	(0.01)	(0.00)	(0.01)	(0.01)
All mother and family controls	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
District dummies	Yes	Yes	Yes	Yes
Observations	9,681	18,377	12,541	13,299
F-stat (first stage)	16.51	41.23	11.64	16.12

Note: division of children into age groups was based on primary school age being 6–12 years. Mother and family controls: mother age, mother attended high school/above, mother attended college/university, mother is caretaker, father present, father age, father attended high school/above, father attended college/university, at least one grandparent in household, rural location, household income (billion Rp), and household income squared (billion Rp). Robust standard errors in parentheses. * p<0.1 ** p<0.05 *** p<0.01.

Source: authors' elaboration based on IFLS data (RAND 2020), SAKERNAS 1995 (BPS 1995), and Indonesian import tariffs (UN Comtrade 2021).

As Table 6 shows, the effects of maternal employment on children's education are significant for boys and girls but, while the education KKL index of boys improves by 0.7 (or 0.99 of its standard deviations), girls' education tends to improve relatively more. On the other hand, in contrast to the effect on sons, the impact of maternal employment on daughters' health status is not statistically significant at conventional levels.

[9] In the health regressions for different ages in Table 5, the test of equality of coefficients on mothers' employment returns a p-value of 0.93. In the regressions for education outcomes, the test of equality returns a p-value of 0.39.

Table 6: 2SLS regressions for heterogeneous impact by child gender

	Z-score of health	Z-score of schooling
Mother employed	0.868***	0.721***
	(0.27)	(0.24)
Mother employed X female child	-0.439***	0.497***
	(0.15)	(0.18)
Female child	0.074	-0.227**
	(0.10)	(0.11)
Child age	0.007***	0.048***
	(0.00)	(0.00)
All mother and family controls	Yes	Yes
Year dummies	Yes	Yes
District dummies	Yes	Yes
Observations	22,222	31,676
F-stat (first stage)	14.32	28.55
Mother employed X [1 + Female child] (beta)	0.429	1.218
Mother employed X [1 + Female child] (p-val)	0.14	0.00

Note: mother and family controls: mother age, mother attended high school/above, mother attended college/university, mother is caretaker, father present, father age, father attended high school/above, father attended college/university, at least one grandparent in household, rural location, household income (billion Rp), and household income squared (billion Rp). Robust standard errors in parentheses. * p<0.1 ** p<0.05 *** p<0.01.

Source: authors' elaboration based on IFLS data (RAND 2020), SAKERNAS 1995 (BPS 1995), and Indonesian import tariffs (UN Comtrade 2021).

Finally, in Table 7, we present our findings on the heterogeneous impacts of maternal employment by rural vs. urban location. This distinction is relevant for capturing specific location characteristics (such as the availability of informal childcare arrangements and the predominance of specific types of employment featuring more flexible hours)[10] which can mediate and shape the maternal employment–child development relationship.[11]

Our results suggests that the effect of maternal employment on children's health and education is driven entirely by the rural sample. Notably, our sample is evenly split between rural and urban areas. Specifically, mother's work increases the health and education KKL indices of children living in rural areas by around 1.24 (coefficient of 0.740) and 1.74 (coefficient of 1.296) standard deviations, respectively. We do not observe impacts in urban areas.

As our findings imply, the greater availability of informal childcare (such as that provided by larger family networks) and the type of work that mothers do in rural areas play an important role in supporting working mothers' investments in children's education and health.

[10] Typically, most working women in rural areas are self-employed and family workers. In our sample, self-employed and family workers represent 77 per cent and 58 per cent of maternal employment in rural and urban areas, respectively.

[11] We carried out analysis of heterogeneous impacts depending on the type of work (self-employed, public, wage employment, casual work), but this necessitated splitting the sample, which resulted in lower F-statistics at the first stage. We do not present these results in the paper, but they are available upon request.

Table 7: 2SLS regressions for heterogeneous impact by location

	Z-score of health	Z-score of schooling
Mother employed	0.367	-0.229
	(0.29)	(0.30)
Mother employed X rural location	0.373**	1.525***
	(0.17)	(0.21)
Female child	-0.212***	0.093***
	(0.01)	(0.01)
Child age	0.007***	0.048***
	(0.00)	(0.00)
All mother and family controls	Yes	Yes
Year dummies	Yes	Yes
District dummies	Yes	Yes
Observations	22,222	31,676
F-stat (first stage)	14.67	27.10
Mother employed X [1 + Rural] (beta)	0.740	1.296
Mother employed X [1 + Rural] (p-val)	0.01	0.00

Note: mother and family controls: mother age, mother attended high school/above, mother attended college/university, mother is caretaker, father present, father age, father attended high school/above, father attended college/university, at least one grandparent in household, rural location, household income (billion Rp), and household income squared (billion Rp). Robust standard errors in parentheses. * p<0.1 ** p<0.05 *** p<0.01.

Source: authors' elaboration based on IFLS data (RAND 2020), SAKERNAS 1995 (BPS 1995), and Indonesian import tariffs (UN Comtrade 2021).

6 Conclusions

The aim of this study was to assess the effect of maternal employment on children's development outcomes in a developing country context. Most of the empirical literature is based on data for high-income countries and presents a wide range of estimates: from negative to null to positive for some groups. The range of estimates suggests that the relationship between maternal work and children's development depends substantially on the context, including the characteristics of maternal work and available childcare arrangements (informal or institutional).

As shown in our descriptive analysis, Indonesia is in a very different position compared to other countries for which causal empirical evidence on the relationship between maternal employment and children's development outcomes is available. Notably, it exhibits relatively lower rates of female employment and a larger concentration of working women in self-employment. Also, compared to rich countries, Indonesia features a rather limited provision of institutional childcare and a large share of workers in the informal sector who, by default, have no entitlement to parental leave.

Our main analysis, based on a sample of 32,214 individuals living in households with at least a mother present, relies on an instrumental variable approach which exploits the exogenous reduction in import tariffs that has taken place in Indonesia since 1995. Further, building on prior literature on the developing countries contexts, we control for contemporaneous household income. This allows us to estimate the impact of maternal work on children's outcomes, net of the income effect.

We find that maternal employment has a positive and significant effect on children's health and education. Specifically, our estimates show that, holding household income constant, the health

and education KKL indices of children of working mothers are, respectively, 1.16 and 1.31 standard deviations higher than those of children of non-working mothers.

Our estimates further indicate that the maternal employment effect does not differ by children's age, but it does differ if comparing rural and urban areas, with positive and significant effects found only in the former. Significant differences emerge across boys and girls, with the latter benefiting relatively more in terms of educational achievement but less in terms of health outcomes.

Lastly, our results show that contemporaneous household income plays a relatively small role in shaping the relationship between maternal employment and children's development outcomes. This finding suggests that, in Indonesia, maternal work predominantly affects children not through income but through other channels such as broader social networks or maternal empowerment. Future research to empirically explore and disentangle the contribution of these factors would provide important insights.

References

Afridi, F., A. Mukhopadhyay, and S. Sahoo (2016). 'Female Labor Force Participation and Child Education in India: Evidence from the National Rural Employment Guarantee Scheme'. *IZA Journal of Labor & Development*, 5(1): 1–27. https://doi.org/10.1186/s40175-016-0053-y

Akresh, R., D. de Walque, and H. Kazianga (2016). *Evidence from a Randomized Evaluation of the Household Welfare Impacts of Conditional and Unconditional Cash Transfers Given to Mothers or Fathers*. Washington, DC: World Bank. https://doi.org/10.1596/1813-9450-7730

Anderson, P.M., K.F. Butcher, and P.B. Levine (2003). 'Maternal Employment and Overweight Children'. *Journal of Health Economics*, 22(3): 477–504. https://doi.org/10.1016/S0167-6296(03)00022-5

Asian Development Bank (2006). *Indonesia: Country Gender Assessment*. Manila: Asian Development Bank.

Baum II, C.L. (2003). 'Does Early Maternal Employment Harm Child Development? An Analysis of the Potential Benefits of Leave Taking'. *Journal of Labor Economics*, 21(2): 409–48. https://doi.org/10.1086/345563

Becker, G.S., and N. Tomes (1979). 'An Equilibrium Theory of the Distribution of Income and Intergenerational Mobility'. *Journal of Political Economy*, 87(6): 1153–89. https://doi.org/10.1086/260831

Benhassine, N., F. Devoto, E. Duflo, P. Dupas, and V. Pouliquen (2015). 'Turning a Shove into a Nudge? A "Labeled Cash Transfer" for Education'. *American Economic Journal: Economic Policy*, 7(3): 86–125. https://doi.org/10.1257/pol.20130225

Bernal, R. (2008). 'The Effect of Maternal Employment and Child Care on Children's Cognitive Development: Employment, Child Care, and Children's Ability'. *International Economic Review*, 49(4): 1173–209. https://doi.org/10.1111/j.1468-2354.2008.00510.x

Bernal, R., and M.P. Keane (2010). 'Quasi-Structural Estimation of a Model of Childcare Choices and Child Cognitive Ability Production'. *Journal of Econometrics*, 156(1): 164–89. https://doi.org/10.1016/j.jeconom.2009.09.015

Bernal, R., and M.P. Keane (2011). 'Child Care Choices and Children's Cognitive Achievement: The Case of Single Mothers'. *Journal of Labor Economics*, 29(3): 459–512. https://doi.org/10.1086/659343

Blumberg, R.L. (1988). 'Income Under Female Versus Male Control: Hypotheses from a Theory of Gender Stratification and Data from the Third World'. *Journal of Family Issues*, 9(1): 51–84. https://doi.org/10.1177/019251388009001004

BPS (1995). *Survei Angkatan Kerja Nasional (SAKERNAS) Agustus 1995—Pedoman Pengawas*. Jakarta Indonesia: Badan Pusat Statistik.

Brauner-Otto, S., S. Baird, and D. Ghimire (2019). 'Maternal Employment and Child Health in Nepal: The Importance of Job Type and Timing across the Child's First Five Years'. *Social Science & Medicine*, 224: 94–105. https://doi.org/10.1016/j.socscimed.2019.02.009

Currie, J. (2009). 'Healthy, Wealthy, and Wise: Socioeconomic Status, Poor Health in Childhood, and Human Capital Development'. *Journal of Economic Literature*, 47(1): 87–122. https://doi.org/10.1257/jel.47.1.87

Del Boca, D., C. Flinn, and M. Wiswall (2014). 'Household Choices and Child Development'. *The Review of Economic Studies*, 81(1): 137–85. https://doi.org/10.1093/restud/rdt026

Del Boca, D., S. Pasqua, and S. Suardi (2016). 'Child Care, Maternal Employment, and Children's School Outcomes. an Analysis of Italian Data'. *European Journal of Population*, 32(2): 211–29. https://doi.org/10.1007/s10680-015-9370-0

Deolalikar, A.B. (1993). 'Gender Differences in the Returns to Schooling and in School Enrolment Rates in Indonesia'. *Journal of Human Resources*, 28(4): 899–932.

Engle, P.L. (1993). 'Influences of Mothers' and Fathers' Income on Children's Nutritional Status in Guatemala'. *Social Science & Medicine*, 37(11): 1303–12. https://doi.org/10.1016/0277-9536(93)90160-6

Ermisch, J., and M. Francesconi (2013). 'The Effect of Parental Employment on Child Schooling'. *Journal of Applied Econometrics*, 28(5): 796–822. https://doi.org/10.1002/jae.2260

Gennetian, L.A., H.D. Hill, A.S. London, and L.M. Lopoo (2010). 'Maternal Employment and the Health of Low-income Young Children'. *Journal of Health Economics*, 29(3): 353–63. https://doi.org/10.1016/j.jhealeco.2010.02.007

Gregg, P., E. Washbrook, C. Propper, and S. Burgess (2005). 'The Effects of a Mother's Return to Work Decision on Child Development in the UK'. *The Economic Journal*, 115(501): F48–80. https://doi.org/10.1111/j.0013-0133.2005.00972.x

Halim, D., E. Perova, and S. Reynolds (2021). 'Childcare and Mothers' Labor Market Outcomes in Lower and Middle-income Countries'. Unpublished working paper.

Haushofer, J., and J. Shapiro (2016). 'The Short-term Impact of Unconditional Cash Transfers to the Poor: Experimental Evidence from Kenya'. *The Quarterly Journal of Economics*, 131(4): 1973–2042. https://doi.org/10.1093/qje/qjw025

Hoddinott, J., and L. Haddad (1995). 'Does Female Income Share Influence Household Expenditures? Evidence from Cote d'Ivoire'. *Oxford Bulletin of Economics and Statistics*, 57(1): 77–96. https://doi.org/10.1111/j.1468-0084.1995.tb00028.x

Hsin, A., and C. Felfe (2014). 'When Does Time Matter? Maternal Employment, Children's Time with Parents, and Child Development'. *Demography*, 51(5): 1867–94. https://doi.org/10.1007/s13524-014-0334-5.

ILOSTAT (2021). *Statistics on the Informal Economy*. Available at: https://ilostat.ilo.org/topics/informality/ (accessed 30 July 2021).

James-Burdumy, S. (2005). 'The Effect of Maternal Labor Force Participation on Child Development'. *Journal of Labor Economics*, 23(1): 177–211. https://doi.org/10.1086/425437

Kevane, M., and D. Levine (2003). 'Changing Status of Daughters in Indonesia'. Working Paper CO3-126. Berkely, CA: Center for International and Development Economics Research, University of California, Berkeley.

Kis-Katos, K., J. Pieters, and R. Sparrow (2018). 'Globalization and Social Change: Gender-specific Effects of Trade Liberalization in Indonesia'. *IMF Economic Review*, 66(4): 763–93. https://doi.org/10.1057/s41308-018-0065-5

Kis-Katos, K., and R. Sparrow (2015). 'Poverty, Labor Markets and Trade Liberalization in Indonesia'. *Journal of Development Economics*, 117: 94–106. https://doi.org/10.1016/j.jdeveco.2015.07.005

Kling, J.R., J.B. Liebman, and L.F. Katz (2007). 'Experimental Analysis of Neighborhood Effects'. *Econometrica*, 75(1): 83–119. https://doi.org/10.1111/j.1468-0262.2007.00733.x

Kovak, B.K. (2013). 'Regional Effects of Trade Reform: What is the Correct Measure of Liberalization?'. *American Economic Review*, 103(5): 1960–76. https://doi.org/10.1257/aer.103.5.1960

Leibowitz, A. (1974). 'Home Investments in Children'. *Journal of Political Economy*, 82(2, Part 2): S111–31. https://doi.org/10.1086/260295

Lépine, A., and E. Strobl (2013). 'The Effect of Women's Bargaining Power on Child Nutrition in Rural Senegal'. *World Development*, 45: 17–30. https://doi.org/10.1016/j.worlddev.2012.12.018

Luke, N., and K. Munshi (2011). 'Women as Agents of Change: Female Income and Mobility in India'. *Journal of Development Economics*, 94(1): 1–17. https://doi.org/10.1016/j.jdeveco.2010.01.002

Menon, N., Y. van der Meulen Rodgers, and H. Nguyen (2014). 'Women's Land Rights and Children's Human Capital in Vietnam'. *World Development*, 54: 18–31. https://doi.org/10.1016/j.worlddev.2013.07.005

Morrill, M.S.(2011). 'The Effects of Maternal Employment on the Health of School-Age Children'. *Journal of Health Economics*, 30(2): 240–57. https://doi.org/10.1016/j.jhealeco.2011.01.001

Mosca, I., V. O'Sullivan, and R.E Wright (2017). 'Maternal Employment and Child Outcomes: Evidence from the Irish Marriage Bar'. IZA Discussion Paper 11085 Bonn: Institute of Labor Economics.

Nankinga, O., B. Kwagala, and E.J. Walakira (2019). 'Maternal Employment and Child Nutritional Status in Uganda'. *PLOS ONE*, 14(12), e0226720. https://doi.org/10.1371/journal.pone.0226720

OECD (2019). *Social Institutions & Gender Index*. Available at: www.genderindex.org (accessed 22 July 2021).

Page, M., J. Schaller, and D. Simon (2019). 'The Effects of Aggregate and Gender-specific Labor Demand Shocks on Child Health'. *Journal of Human Resources*, 54(1): 37–78. https://doi.org/10.3368/jhr.54.1.0716.8045R.

Pieters, J., and S. Rawlings (2020). 'Parental Unemployment and Child Health in China'. *Review of Economics of the Household*, 18(1): 207–37. https://doi.org/10.1007/s11150-019-09457-y

Qian, N. (2008). 'Missing Women and the Price of Tea in China: The Effect of Sex-Specific Earnings on Sex Imbalance'. *Quarterly Journal of Economics*, 123(3): 1251–85. https://doi.org/10.1162/qjec.2008.123.3.1251

Quisumbing, A.R., and J.A. Maluccio (2003). 'Resources at Marriage and Intrahousehold Allocation: Evidence from Bangladesh, Ethiopia, Indonesia, and South Africa'. *Oxford Bulletin of Economics and Statistics,* 65(3): 283–327. https://doi.org/10.1111/1468-0084.t01-1-00052

RAND (2021). *The Indonesian Family Life Survey (IFLS)*. Available at: https://www.rand.org/well-being/social-and-behavioral-policy/data/FLS/IFLS.html (accessed 13 July 2020).

Rashad, A.S., and M.F. Sharaf (2019). 'Does Maternal Employment Affect Child Nutrition Status? New Evidence from Egypt'. *Oxford Development Studies*, 47(1): 48–62. https://doi.org/10.1080/13600818.2018.1497589

Reynolds, S.A., L. C.H. Fernald, and J.R. Behrman (2017). 'Mothers' Labor Market Choices and Child Development Outcomes in Chile'. *SSM – Population Health*, 3: 756–66. https://doi.org/10.1016/j.ssmph.2017.08.010

Rosenzweig, M.R., and T.P. Schultz (1983). 'Estimating a Household Production Function: Heterogeneity, the Demand for Health Inputs, and their Effects on Birth Weight'. *Journal of Political Economy*, 91(5): 723–46. https://doi.org/10.1086/261179

Ruhm, C.J. (2008). 'Maternal Employment and Adolescent Development'. *Labour Economics*, 15(5): 958–83. https://doi.org/10.1016/j.labeco.2007.07.008

Schaner, S., and S. Das (2016). 'Female Labor Force Participation in Asia: Indonesia Country Study'. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.2737842

Schildberg-Hoerisch, H. (2011). 'Does Parental Employment Affect Children's Educational Attainment?'. *Economics of Education Review*, 30(6): 1456–67. https://doi.org/10.1016/j.econedurev.2011.07.013

Shrimpton R. and C. Rokx (2013) 'The Double Burden of Malnutrition in Indonesia'. World Bank Jakarta, Report 76192-ID. Washington, DC: World Bank.

Thomas, D. (1990). 'Intra-household Resource Allocation: An Inferential Approach'. *The Journal of Human Resources*, 25(4): 635. https://doi.org/10.2307/145670

Ukwuani, F.A., and C.M. Suchindran (2203). 'Implications of Women's Work for Child Nutritional Status in Sub-Saharan Africa: A Case Study of Nigeria'. *Social Science & Medicine*, 56(10): 2109–21. https://doi.org/10.1016/S0277-9536(02)00205-8

UN Comtrade (2021). *Indonesia Tariff Schedule*. Available at: https://wits.worldbank.org/tariff/trains/en/country/IDN (accessed 29 March 2021).

van der Meulen Rodgers, Y., and A.L. Kassens (2018). 'Women's Asset Ownership and Children's Nutritional Status: Evidence from Papua New Guinea'. *Social Science & Medicine*, 204: 100–07. https://doi.org/10.1016/j.socscimed.2018.03.026

Verropoulou, G., and H. Joshi (2009). 'Does Mother's Employment Conflict with Child Development? Multilevel Analysis of British Mothers Born in 1958'. *Journal of Population Economics*, 22(3): 665–92. https://doi.org/10.1007/s00148-007-0157-4

Waldfogel, J., W.-J. Han, and J. Brooks-Gunn (2002). 'The Effects of Early Maternal Employment on Child Cognitive Development'. *Demography*, 39(2): 369–92. https://doi.org/10.1353/dem.2002.0021

World Bank (2016). 'Live Long and Prosper: Aging in East Asia and the Pacific'. East Asia and Pacific Regional Flagship Series. Washington, DC: The World Bank Group.

World Bank (2021). *World Development Indicators (WDI)*. Available at: https://databank.worldbank.org/source/world-development-indicators (accessed 24 June 2021).

Appendix

Table A1: Falsification test—tariff exposure and child employment

	All children aged 6–18			Boys aged 6–18			Girls aged 6–18		
Tariffs instrument	0.002	0.001	0.001	0.001	0.000	0.000	0.002	0.001	0.001
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Female child	-0.034***	-0.033***	-0.033***						
	(0.00)	(0.00)	(0.00)						
Child age	0.030***	0.016***	0.016***	0.036***	0.019***	0.019***	0.024***	0.013***	0.013***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Mother age		-0.000	-0.000		-0.000	-0.000		-0.001	-0.001
		(0.00)	(0.00)		(0.00)	(0.00)		(0.00)	(0.00)
Mother attended high school or above		-0.022***	-0.022***		-0.021***	-0.022***		-0.023***	-0.023***
		(0.00)	(0.00)		(0.01)	(0.01)		(0.00)	(0.00)
Mother attended college/university		0.009	0.008		0.012	0.012		0.010	0.010
		(0.01)	(0.01)		(0.01)	(0.01)		(0.01)	(0.01)
Mother is caretaker		-0.146***	-0.146***		-0.175***	-0.175***		-0.115***	-0.115***
		(0.00)	(0.00)		(0.01)	(0.01)		(0.01)	(0.01)
Father present		-0.025*	-0.025*		-0.039*	-0.039**		-0.009	-0.008
		(0.01)	(0.01)		(0.02)	(0.02)		(0.02)	(0.02)
Father age		0.000	0.000		0.001	0.001		0.000	0.000
		(0.00)	(0.00)		(0.00)	(0.00)		(0.00)	(0.00)
Father attended high school or above		-0.030***	-0.030***		-0.033***	-0.033***		-0.026***	-0.026***
		(0.00)	(0.00)		(0.01)	(0.01)		(0.00)	(0.00)
Father attended college/university		-0.017***	-0.017***		-0.027***	-0.027***		-0.011	-0.010
		(0.01)	(0.01)		(0.01)	(0.01)		(0.01)	(0.01)
At least one grandparent in household (HH)		-0.008**	-0.008**		-0.012**	-0.012**		-0.002	-0.002
		(0.00)	(0.00)		(0.01)	(0.01)		(0.00)	(0.00)
Household size		0.002	0.002		0.003**	0.003**		0.000	0.000
		(0.00)	(0.00)		(0.00)	(0.00)		(0.00)	(0.00)
Rural location		0.012***	0.012***		0.022***	0.022***		-0.001	-0.001
		(0.00)	(0.00)		(0.01)	(0.01)		(0.01)	(0.01)
HH income per capita (billion Rp) (W99)			0.036			0.236			-0.153
			(0.18)			(0.25)			(0.24)
HH income per capita squared (billion Rp) (W99)			-0.103			-0.924			0.722
			(0.68)			(0.91)			(1.00)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
District dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	32,214	32,214	32,214	16,568	16,568	16,568	15,646	15,646	15,646

Source: authors' elaboration based on IFLS data (RAND 2020), SAKERNAS 1995 (BPS 1995), and Indonesian import tariffs (UN Comtrade 2021).