



Roles of Socio-economic Environments on the Relationship between Number of Children and Maternal Employment in Indonesia

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Abstract

Incompatibility between child-rearing and maternal employment has been assumed to result in a negative relationship between number of children and maternal employment. The higher the degree of incompatibility, the stronger is the negative correlation. In other words, the degree of this incompatibility affects the sign and magnitude of the relationship between number of children and maternal employment. However, existing studies have not considered whether the relationship varies by the mother's socioeconomic environment. This paper fills this gap by using three Indonesian data sets: 2015 socio-economic survey to obtain individual variables, 2014 village potential survey to have socio-economic environments at the village level, and published data to measure socio-economic environments at the district level. It uses a logistic regression with maternal employment as the dependent variable and two main independent variables: number of children and a set of socioeconomic environment variables. The impact of socio-economic environments is seen by examining the coefficients of interaction between socio-economic environments and number of children. The empirical results show that the relationship depends on the indicators used to measure the socio-economic environments. Some indicators of socio-economic environments strengthen the relationship, some weaken, and some do not have any impact.

Keywords: Maternal employment, Fertility, Number of children, Socio-economic environment

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INTRODUCTION

Many studies concluded that number of children negatively affects probability of married women joining the labour market. (Klasen et al., 2019; Ismail and Sulaiman, 2014; and Faridi and Rashid, 2014). These studies assumed the existence of incompatibility between child-care and maternal employment and that child-care is exclusively the responsibility of mothers/women. The existence of incompatibility results in the negative relationship. The higher the degree of incompatibility, the stronger is the negative correlation. In other words, the degree of this incompatibility affects the sign and magnitude of the correlation between fertility and maternal employment.

Furthermore, this incompatibility may depend on socio-economic environments where the women live (Rindfuss et. al., 2003; Kogel, 2004 and Oshio, 2019). Availability of child-care service is an example of socio-economic environments which may ease the incompatibility. Changing norms from child-care as the woman job to

shared responsibility between man and woman may also reduce the woman's incompatibility between child-care and employment. On the other hand, Troske and Voicu (2013) showed that economic development may raise the private cost of having a child through better employment opportunities for women and/ or better availability of goods-services which can compete the joy from having children and therefore raising the degree of incompatibility between having children and working.

There are empirical studies which focused on how social and economic environments affect individual behaviour (Sari, 2012; Salehi et al, 2016, Dingemans et.al, 2017 and Morris et al, 2018). Furthermore, Cameron et al. (2018) related the socio-economic environments to the probability of women joining the labour market in Indonesia. Nevertheless, no study has analysed empirically how the relationship between number of children and maternal employment may vary in different socio-economic environments. This paper fills this gap, by examining how the impact of number of children on probability of maternal employment varies by socio-economic environments where the woman lives. The research question is therefore, whether socio-economic environments strengthen or weaken the impact of the relationship between number of children and maternal employment.

It merges two Indonesian data sets: 2015 National Socio-economic survey to have individual information and 2014 Village Potential Survey to obtain information on socio-economic environments at village level. This paper also uses published data on poverty and income at district level to capture economic environment.

A logistic regression analysis is conducted with maternal employment as the dependent variable and number of children as one of the main independent variables. A set of variables on socioeconomic environments shows other main independent variables. To examine whether the above relationship varies by socioeconomic environments, this paper puts interaction terms between number of children and variables on socio-economic environments. Economic environment is measured with per capita GDP and poverty at district level; availability of small and medium enterprises (SMEs), and distance to sub-district office at village level. Social environment is indicated with health facilities, education facilities and existence of crime at village level.

The next section is a literature study on how number of children is related to maternal employment and how the relationship varies by socio-economic environments. The third section discusses the theoretical framework and hypotheses. The fourth section is a statistical model to examine whether the relationship between maternal number of children and maternal employment varies by socioeconomic environments.

The fifth section describes the variables used in this paper: their measurement and data used. The sixth section analyses the statistical results. The paper is concluded in the seventh section.

LITERATURE REVIEW

Relationship between Number of Children on Maternal Employment

The impact of number of children on marital employment varies depending on the countries and age of children. In a study on eight low and middle income economies, using a large scale household survey in each country, Klasen et al. (2019) found that the impact of number of children aged 0-4 on urban married women labour

force participation is negative in all countries (Bolivia, Brazil, India, Indonesia, Jordan, South Africa, Tanzania, and Vietnam). However, the result is not clear, when they used children aged 5-14. They found insignificant relationship in Tanzania, Vietnam, and Bolivia, positive one in India, and negative one in South Africa, Brazil, Jordan, and Indonesia. The analysis was controlled with age, education, household income, male salaried employment, and ethnicity of the woman. The result may indicate that there is less incompatibility between maternal employment and rearing children aged 5-14.

Ismail and Sulaiman (2014) also found a negative relationship between number of children- and women' labour force participation in Peninsular Malaysia. They used husband's wage, own wage, years of schooling, age, non-labour income, and perception of globalization as the control variables. Faridi and Rashid (2014) found that number of children has a negative impact on women's hours worked and women's income in Pakistan. Both papers did not mention the age of the children.

Ekert-Jaffe and Stier (2009) examined the possible incompatibility between having children and women employment in Israel. They tested the possibility of a bi-direction causality between fertility and employment. They found that fertility affected employment negatively but decision to work did not affect the decision to have a child.

Impact of Socio-economic Environments on Individual Behaviours

The neighbourhood or socioeconomic environments where people live may affect individual behaviour. Salehi et al. (2016) showed that socio-economic environments where people live affect their individual behaviour. They examined the impact of socioeconomic characteristics of neighbourhood on wealth and life styles of young Iranian women in 2013. With a cluster convenience sampling, they found that better socio-economic neighbourhood is related to better wellbeing and healthier lifestyle among the individuals.

Dingemans et al. (2017) concluded that socio-economic environments affect whether retirees continued to work in 16 European countries. When retirees lived in a country with a generous pension system, the retirees are less likely to work. When norms in the society supports older people to work, retirees are more likely to work.

Morris et al. (2018) also found that socio-economic variables affect individual smoking behaviour. However, they also showed that individual variables (in this case, family role) are more important in determining individual smoking behaviour, because the children know their parents more than their environment. They used a longitudinal data in South West England.

Studies have also specifically indicated how socio-economic environments affects people decision to join the labour market. Sari (2012) investigated whether an economically deprived location affects probability of male labour force participation. She used the city of Paris as the deprived location and three administrative districts (Seine_Saint_Denis, Val_de_Marne, and Hauts de Seine) as the non-economically deprived location. She utilized data from French Population Census 1999, containing data for a neighbourhood level and individual level. She found that deprived neighbourhood was more likely to have lower probability of male labour force participation. She used the following variables to control the regression: age, house ownership, tenant in public housing, education level, occupational status, spouse's characteristics, and work distance.

Chakraborty et al. (2015) found that living in an area with a higher rate of crime against women at village level reduced probability of women joining the labour market. They used data from Indian Human Development Survey (IHDS) 2004-2005 containing information at individual, household, and village levels.

Rindfuss et. al (2003) argued that different socio-economic environments may have different impact of the intensity of incompatibility between maternal employment and child-rearing. However, they did not test statistically how different socio-economic environments affects the intensity of the incompatibility.

Cameron et al. (2018) analysed impacts of socioeconomic environments on women's work participation in Indonesia. They used 1996, 2000, 2011, and 2013 national socioeconomic survey (SUSENAS) as well as 2008 and 2011 village census (Podes). To estimate the determinants of female labour force participation, they used a probit model. They concluded that married woman in rural areas is 11 percentage point less likely to join the labour market compared to the single woman in rural areas. In urban areas, the married woman is much less likely to join the labour market compared to the urban single woman. Level of educational attainment is also a strong positive correlate of female labour force participation. Household size is associated with decreased participation for women in rural areas but positive in urban areas. The presence of young children (below 12) is associated with a decrease in the likelihood of women participating in the labour market. The association is positive with number of children 12-17 years old. Distance to district office has positive relationship, though small. Main income from industry has negative impact.

Nevertheless, Cameron et.al (2018) had not examined how the socio-economic environments affect the impact of number of children on maternal employment. As in Rindfuss et. al (2003), this study did not put interaction terms between number of children and socio-economic environments.

THEORETICAL FRAMEWORK

Direct Impact of Socio-economic Environments on Maternal Employment

This paper hypothesizes that improvement in economic environment may directly increase probability of maternal employment, as it increases the benefit of working. On the other hand, improvement in economic environment may also increase husband's income and therefore reduce probability of woman joining the labour market. However, this income effect may be minimized or eliminated if the regression equation is controlled with husband's socio-economic status and wealth of the household and conditions of the household.

Social norms may also affect probability of maternal employment. Women living in societies which believe that women's place is in the household may reduce probability of maternal employment. On the other hand, women living in societies which acknowledge women's aspiration may encourage maternal employment. Women living in society with presence of crime may reduce the probability of maternal employment. However, there is no a priori hypothesis on how education and health facilities in the communities may affect maternal employment.

Impact of Number of Children on Maternal Employment

The discussion on relationship between number of children and maternal employment is based on the argument whether there exists incompatibility between roles of child rearing and maternal employment. The higher the incompatibility of the

roles, the stronger is the negative relationship between number of children and probability of maternal employment. When the roles are compatible, such as when there are a lot of care-givers at the household, there may not be any relation between probability of maternal employment and number of children. The incompatibility of the roles also depend on the job of the women. If the jobs are close to home or at home, there may not be any incompatibility. If there are child care at the working places, the incompatibility may not exist.

As children aged 0-5 may take much of woman's time, an increase in number of children 0-5 may reduce the probability of maternal employment. It implies a negative relationship between maternal employment and number of children aged 0-5.

On the other hand, children aged 6-15 may not take much of the woman's time and therefore number of children aged 6-15 may not reduce the probability of maternal employment. It is also possible that children aged 6-15 impose higher expenditure, as they go to school and want more for their consumption and human capital (especially education). Therefore, the woman may join the labour market to increase household income. Further research should examine which possibility is more likely to happen. Nevertheless, whatever the explanation, this study hypothesizes that number of children aged 6-15 has positive impact on maternal employment, that probability of maternal employment has a positive relationship with number of children aged 6-15.

Impact of Socio-economic Environments on the Relationship

The impact of economic environments on the relationship depends on the age of the children. It hypothesizes that improvement in economic environment raises the private cost of having an additional child aged 0-5 and provides more competition for the joy from having an additional child. In other words, better economic environments are hypothesized to strengthen the negative relationship between maternal employment and number of children aged 0-5.

On the other hand, as probability of maternal employment is hypothesised positive relation with respect to number of children aged 6-15, this paper hypothesizes that improvement in economic environment strengthens the positive relationship, as better economic environment induces women to work in the labour market while the women do not have much incompatibility with taking care of children 6-15.

There are four indicators of economic environments. Two indicators at the village level: number of MSEs (medium and small enterprises) and distance from the village to the sub-district capital. An increase in number of MSEs is supposed to indicate relatively more employment opportunities at the village. Distance may reflect the economic stage of a village. The longer the distance to the sub-district capital, the less developed is the economy of the village. In other words, shorter distance may indicate better economic situation at the village level. Two other indicators of economic environments are at district level. Rate of poverty and per capita GDP. Improvement in economic environment at district is indicated by lower poverty rate and higher per capita GDP.

Therefore, this paper hypothesises that number of MSEs and per capita GDP have negative coefficient of interaction with number of children aged 0-5, as improvement in employment opportunity may raise the incompatibility between time to take care of children aged 0-5 and time to devote to labour market. The coefficient is hypothesized to be positive as there is no expected incompatibility among women

with children aged 6-15. The existence of the children may even encourage women to work in the labour market.

Increase in poverty indicates worsening economic performance. Therefore, consistent with MSEs and per capita GDP, poverty is hypothesized to have a positive coefficient of interaction with children aged 0-5 and negative coefficient with children aged 6-15. Distance to sub-district indicates whether the woman is far from employment opportunities in the sub-district office or not. Longer distance implies less employment opportunities at the sub-district. It is not clear whether women will then be more likely to work in the labour market or not.

This paper also has four indicators of social environments. First is existence of crime in the village, which is hypothesized to strengthen the negative relationship between number of children aged 0-5 and maternal employment; and weaken the positive relationship between number of children aged 6-15 and maternal employment. Second is number of village health centres. If number of health centres indicate better health in the village, number of health centre may raise the probability of working. It may weaken the negative relationship with respect to children aged 0-5 and strengthen the positive relationship among children aged 6-15.

Third is number of kindergarten at the village. This kindergarten may ease the incompatibility between taking care of children aged 0-5 and working at the labour market. Therefore, number of kindergarten may raise the probability of working among women with children aged 0-5. It may reduce the negative elasticity with respect to children aged 0-5 and strengthen the positive elasticity with respect to children aged 6-15.

Fourth is number of primary schools at village. This may not affect number of children aged 0-5 as primary school age is usually between 6 and 12 years old. It is hypothesized to strengthen the positive elasticity of probability of working with respect to number of children aged 6-15, either because it may release the time of the women to join the labour market or increase in number of children aged 6-15 increases household expenditure and then forces the woman to join the labour market.

METHOD

Statistical Model

It uses a logistic regression analysis with natural logarithm of odd ratio of maternal employment as the dependent variable. There are two main independent variables and one set of individual control variables. The first main independent variable is an individual variable on number of children in a household. The dependent variable (indicating the probability of maternal employment) is measured in 2015, while number of children mostly occurred before 2015. The use of this measurement is therefore solving the reverse causality discussed in Noseliet (2014), where fertility and employment may have a two-way relationship.

The second main independent variable is a set of socio-economic environments. The economic environments include per capita GDP (district), poverty (district), number of small and medium enterprises (village), and distance (village) to the nearest sub-district head office. The social environments consist of occurrence of crime (village), number of community health service centres (village), and number of kindergartens (village), and number of primary schools (village). The control variables are individual variables: age, years of schooling, husband age, years of schooling of

husband, employment status, size of household, per capita expenditure, urban/rural area, recipient of social protection card, ownership of motorcycle, ownership of car, per capita floor area, type of wall and floor. These control variables are used to minimize income effect (through husband and household financial situation) because of changes in economic performance.

The statistical equation can be seen below (eq. 1) with p is probability of maternal employment, $Child$ is number of children in a household, Env is a set of socio-economic variables, X is set of individual control variables, i refers to different variables under the set of socio-economic variables, and J refers to different individual control variables

$$\text{Ln} \left(\frac{P}{1-P} \right) = \alpha + \beta \text{Child} + \delta \text{Env}_i + \gamma (\text{Child} * \text{Env}_i) + \omega X_j + \varepsilon \quad (\text{eq. 1})$$

Equation (1) reveals how socio-economic environments may be related to maternal employment. The environments can affect the probability of maternal employment “directly” (shown by δ) and/or indirectly through the impact of number of children on maternal employment (shown by γ). Here, “directly” simply means that environments do not affect the probability through the coefficient of number of children. It may affect through other channels, which are not studied here. The analysis is conducted in two different equations. One is with number of children aged 0-5; and another, with children aged 6-15.

Equation (1) can also show how $Child$ may affect maternal employment in different socioeconomic environments. Equation (2) shows the impact of change in $Child$ on natural logarithm of the odd ratio of maternal employment by considering the Env . It shows that the impact varies by the socioeconomic environments (ENV)

$$\frac{\partial \text{Ln} \left(\frac{P}{1-P} \right)}{\partial \text{Child}} = \beta + \gamma \text{Env} \quad (\text{eq. 2})$$

Equation (2) shows the impact of a change of unit of number of children on natural logarithm of odd ratio, that is $(\beta + \gamma \text{Env})$. If the β is negative, a negative γ strengthens the negative impact of $CHILD$ on maternal employment, raising the incompatibility between maternal employment and number of children; a positive γ reduces the negative impact, weakening the incompatibility.

Data

The 2015 National Socio-economic Survey (SUSENAS) is used to obtain individual variables, including the dependent variable. (<https://silastik.bps.go.id>) SUSENAS is one of the surveys conducted by Statistics-Indonesia, to collect data at individual level on economic conditions of people. Because husbands' role can be important in the decision to join the labour market, the sample of married women is limited to those who have husbands, either living in the same households or outside the households. The sample is concentrated to women of reproductive ages, 20-49. The sample then has 225,528 observations, declining from 285,908. Because of missing information on some control variables, the total number of observations becomes 164,516.

The information on socio-economic environments is based on 2014 Village Potential (PODES) survey (<https://silastik.bps.go.id>), which collects information on socio-economic environments at village level. This survey started in 1980 along with the 1980 Population Census. It provides data at village level on information such as

regional infrastructure/facilities and other aspects of community life. Then, the information of socio-economic environments are merged to the individual data set from 2015 SUSENAS, as the 2015 SUSENAS has the code for the villages, implying that all individuals living within a given socio-economic environment have the same information on that socio-economic environment. This research also uses published data on per capita GDP and depth of poverty at district level from Badan Pusat Statistik (2016).

RESULT AND DISCUSSION

Relationship between Number of Children and Maternal Employment

Table 1 shows variables related to maternal employment without considering socio-economic environment. The log-odd of probability of maternal employment is the dependent variable. The main independent variable is number of children. The second column is the logistic regression among women with children aged 0-5; the third column, women with children aged 6-15.

Table 1. Relation between Number of Children and Probability of Maternal Employment

	Age of Children			
	0-5		6 - 15	
	Model 1	Model 2	Model 1	Model 2
# of Children	-0.334**	-0.253**	0.105**	0.133**
Individual Characteristics				
Age	n.a	0.038**	n.a	0.047**
Years of schooling	n.a	0.052**	n.a	0.049**
Husband's age	n.a	-0.011**	n.a	-0.008**
Husband's years of schooling	n.a	-0.022**	n.a	-0.024**
Husband' s status of employment	n.a	-0.327 **	n.a	-0.354**
Household size	n.a	0.020**	n.a	-0.072**
Urban areas	n.a	-0.439**	n.a	-0.432**
Wealth				
Household per capita expenditure	n.a	0.054**	n.a.	0.068**
Recipient of social protection card	n.a	0.181**	n.a.	0.163**
Dummy ownership of motor cycles	n.a	-0.099**	n.a.	-0.069**
Dummy ownership of cars	n.a	0.154**	n.a.	0.138**
Per capita household floor area	n.a	0.003**	n.a.	0.003**
Dummy wall (1= concrete 0=others)	n.a	-0.204**	n.a.	-0.194**
Dummy floor (1= ceramics 0= others)	n.a	-0.213**	n.a.	-0.219**
Constant	0.480	-0.289**	0.194**	-0.556**
Number of Observations	164,516	164,516	164,516	164,516

Note: n.a - not available, *significant at 5%, ** significant at 1%. Source: by the author

Table 1 finds that the coefficient of number of children is negative among women with children aged 0-5. As hypothesized, the result may reveal that children are “burden” for a woman with the children aged 0-5. These children may still take much attention and time from the women. There exists incompatibility between maternal

employment and taking care of children aged 0-5. Therefore, the higher the number of children, the smaller is the likelihood of the woman to be employed.

On the other hand, Table 1 also shows the coefficient of number of children aged 6-15 on maternal employment is positive, indicating that the higher the number of children aged 6-15, the more likely that the women is to be employed. As hypothesised,

children aged 6-15 may have freed the woman's time from taking much of her time in the household. It is also possible that higher number of children may imply higher expenditure needed to finance the children, and therefore the woman needs to join the labour market.

Table 2 shows the results of a logistic regression similar to Table 1, but it includes variables on socio-economic environments. The table 2 indicates that the above conclusions remain when the regression is controlled with socioeconomic variables

Table 2. Number of Children and Maternal Employment by Individual Variables and Socio-economic Environments

	Age of Children	
	0-5	6-15
# of Children	-0.227**	0.190**
Individual Characteristics		
Age	0.038**	0.047**
Years of schooling	0.059**	0.055**
Husband's age	-0.009**	-0.006**
Husband's years of schooling	-0.022**	-0.024**
Husband's status of employment	-0.375**	-0.398**
Household size	0.016**	-0.078**
Urban areas	-0.235**	-0.231**
Wealth		
Household per capita expenditure	0.099**	0.111**
Recipient of social protection card	0.132**	0.109**
Dummy ownership of motor cycles	0.048**	0.081**
Dummy ownership of cars	0.129**	0.117**
Per capita household floor area	0.002**	0.002**
Dummy wall (1= concrete 0=others)	-0.208**	-0.200**
Dummy floor (1= ceramics 0= others)	-0.149**	-0.155**
Economic environments		
# of MSEs	0.001**	0.001**
Distance to sub-district office	0.006**	0.002*
Poverty	0.093**	0.107**
Per capita GDP	-0.006**	-0.006**
Per capita GDP ²	0.000**	0.000**
Social environments		
Dummy crime	-0.139**	-0.131**
# of village health centres	0.084**	0.048**
# of kindergarten	-0.012**	-0.004
# of primary schools	-0.000	-0.001
Economic Interaction		
Child*SMEs	-0.000**	-0.000**

	Age of Children	
	0-5	6-15
# of Children	-0.227**	0.190**
Child*Distance to sub-district office	-0.000	0.003**
Child*poverty	0.009**	-0.008**
Child*GDP per capita	-0.000	-0.001**
Social Interaction		
Child*Crime	-0.024	-0.018
Child*Health centres	-0.043**	0.009
Child*Kindergarten	0.001	-0.007**
Child*Primary Schools	-0.002	-0.000

Note: *significant at 5%, ** significant at 1%. Source: by the author

The next two sub-sections examine how socio-economic environments directly affects maternal employment and how the environments affect the relationship between number of children and maternal employment.

Direct Impact of Socio-economic Environments on the Maternal Employment

Table 2 shows that the direct impact of economic environment on probability of maternal employment are the same for both children aged 0-5 and 6-15. At the district level, improvement in per capita GDP has a U shape relationship with maternal employment, though the magnitude of the squared per capita GDP is very small. At first, an increase in per capita GDP results in a lower probability of maternal employment. At a certain level of per capita GDP, the relationship becomes positive. This result is similar to Goldin (1995) and Tam (2011), which showed that GDP has U shape relationship with female labour force participation, that a higher GDP is initially associated with lower female labour force participation rate. This phenomenon is seen when a country is undergoing a change from a very low level to higher level of development. to

Furthermore, as hypothesized, improvement in village economic opportunity, indicated by a higher number of MSEs, raises probability of maternal employment. It is possible that the improvement in economic environment at the village raises benefit of working as the women may have easier access to the employment opportunity.

However, poverty at the district level also has a positive relationship with maternal employment. At the district level poverty may have pushed woman with children aged 0-5 to work, shown by the positive coefficient of poverty. A similar result is seen among women with children 6-15, an increase in poverty is associated with an increase in maternal employment. The result is consistent with distance to sub-district capital at the village level, which also has a positive coefficient. The longer the distance (with less economic opportunity), the higher is the probability to be employed.

The results from these two indicators (poverty and distance to sub-district office) are not as hypothesized. The empirical results indicate that worsening economic performance is associated with higher probability of maternal employment. In short, the direct impact of economic environments on probability of maternal employment is mixed. If per capita GDP at district level and number of MSEs at village level are used as the indicators of economic performance, then favourable economic performance may raise probability of maternal employment). On the other hand, if

poverty at district level and distance to sub-district office at village level indicate failure in economic performance, then unfavourable economic performance may raise maternal employment. Further studies need to be done to explain this phenomenon.

Similar to economic environments, Table 2 indicates that the direct impact of social environment does not depend on the age of children either, except for number of kindergarten. As hypothesized, there is no impact of number of kindergarten among women children 6-15. Nevertheless, number of kindergartens in a village is associated with a lower probability of maternal employment among women with children aged 0-5. Availability of kindergarten in a village may not ease the incompatibility between raising children and working. The number of hours spent by the children at the kindergarten may not significantly affect the probability of maternal employment. Instead, number of kindergartens in a village may have indicated economic status of the village.

With this interpretation, that number of kindergarten is an indicator of economic environment, the negative sign of number of kindergarten is consistent with those in economic environment: that improvement in per capita GDP is initially accompanied by lower probability of maternal employment, and less poverty discourages women from working.

Number of primary school does not have any impact on probability of maternal employment. On the other hand, number of primary health centres increases the probability of maternal employment. It may reflect better health status of the women. Furthermore, as expected, a woman living in a village experiencing crime is less likely to be employed.

Indirect Impacts of Socioeconomic Environment on Maternal Employment

This section shows the empirical results on the indirect impact of socio-economic environments on maternal employment by examining whether the relationship between number of children and maternal employment varies by socioeconomic environments. The impact of economic environments is indicated by the coefficient of interaction between number of children and economic environments.

As hypothesized, Table 2 shows that economic environment strengthen the negative relationship between number of children aged 0-5 and maternal employment, shown by the negative sign of the interaction between indicators of economic environment and number of children aged 0-5. It should be noted that only two indicators are significant: number of MSEs (showing favourable economic performance) and poverty (showing unfavourable economic performance). The other two indicators show that economic environment does not have impact on the relationship between number of children and maternal employment.

Nevertheless, the results for women with children aged 6-15 are not conclusive. Improvement in economic performance weaken the positive relationship between number of children and maternal employment. In other words, progress in economic development reduces the incompatibility between number of children aged 6-15 and maternal employment. The results are found when development is measured with GDP per capita and number of SMEs, with negative coefficients of interaction. The coefficient of interaction between Child and distance to sub-district office is positive, implying the shorter the distance (the better economic opportunities) reduce the positive relationship.

On the other hand, development may strengthen the positive relationship if development is measured with poverty. The coefficient on interaction between Child and Poverty is negative, implying reducing poverty (improvement in development) weakens the positive relationship.

Unlike indicators of economic environment, there is only one significant indicator of social environment. It is number of health centres at village with respect to number of children aged 0-5, having a negative coefficient of the interaction, strengthening the negative relationship.

With respect to number of children aged 6-15, number of kindergarten is the only variable with a significant coefficient. It has a negative coefficient of interaction, weakening the positive relationship. If number of kindergarten reflects economic environment as discussed earlier, an increase in economic performance may be likely to discourage women to work.

On the other hand, number of kindergarten does not affect the relationship between number of children aged 0-5 and maternal employment. Perhaps, as discussed earlier under direct impact, when the children are under 5 years old, the short duration in the kindergarten may not affect the decision of the woman to work. Another possibility is that this paper has not considered the quality of the kindergarten and the cost to join the kindergarten.

Other indicators (existence of crime and number of primary schools) have no significant coefficients of the interactions. Existence of crime does not have any impact whatever the age of the children. This may be because the data only refers whether crime exists in the previous year, regardless the frequency and severity. Number of primary schools is not significant for both ages of the children. Number of primary schools may not be relevant for children aged 0-5 but may be relevant for children 6-15. However, empirical results show that the impact is not significant.

CONCLUDING REMARKS

The main contribution of this paper is its examination on the existence of impact of socio-economic environment on individual behaviour, in particular the relationship between maternal employment and number of children and the direction (positive or negative) of the relationship. It uses quantitative indicators of socio-economic environments. With a logistic regression analysis, it analyses the significance and direction of the interaction between number of children and indicators of socio-economic environment, to test the existence and direction of the impact of socio-economic environments on the relationship.

It finds out that, without being controlled with socio-economic environments, relationship between maternal employment with respect to number of children aged 0-5 is negative, indicating incompatibility between taking care of children aged 0-5 and working at labour market. On the other hand, the relationship is positive with respect to number of children aged 6-15. There seems no incompatibility between taking care of children aged 6-15 with working in the labour market. Even, the number of children at this age may push the woman to work as the children imposes higher household expenditure. These relationships remain when the analysis is controlled with individual variables and socio-economic environments.

This paper further concludes that socio-economic can affect maternal employment directly as seen in previous studies. However, this paper also shows that socio-economic environments can affect maternal employment indirectly through the

relationship between number of children and maternal employment. In other words, socio-economic environments may affect the relationship between maternal employment and number of children. The effect may strengthen (increasing the absolute value of the relationship), weaken (reducing the absolute value of the relationship) or have no impact on the relationship. The paper concludes that the empirical results depend on the indicators used to measure socio-economic environments and age of the children.

The results with children aged 0-5 are more consistent. An improvement in economic environments (indicated by increase in number of MSEs and a decline in poverty) strengthens the negative relationship. Improvement in district and village economy may increase the incompatibility between maternal employment and child-rearing. However, there is no impact on the relationship when measured with less distance to sub-district capital (better economic opportunity) and higher capita GDP.

On the other hand, the results are not clear with respect to number of children aged 6-15. Economic improvement as indicated by shorter distance, higher number of SMEs and higher per capita GDP weakens the positive relationship. On the other hand less poverty strengthens the positive relationship. The mixed results with respect to number of children aged 6-15 need deeper studies on the incompatibility of maternal employment and child rearing. Perhaps, there are some other channels through which improvement in economic performance may affect maternal employment through number of children aged 6-15.

The paper also finds that there is only one significant indicator for social environment, number of village health centres in the regression with number of children aged 0-5; and number of kindergartens, for children aged 6-15. The number of health centres strengthens the negative relationship with respect to number of children aged 0-5; but the number of kindergartens weakens the positive relationship with respect to number of children aged 6-15. Other indicators (number of primary schools and existence of crime) are not significant. There are three possibilities to interpret the results on social environment. First is that the social environment does not have any important role in the degree of incompatibility between maternal employment and taking care of children. Second is that we need better indicators of social environments. Third is a combination of the two possibilities.

Further studies should explore more indicators and carry out the analysis with different data sets. They should also go deeper on substantive reasons explaining the mechanism of impact of socio-economic environments on the elasticity of maternal employment with respect to number of children. One policy implication is that improving economic development in the village/ district will strengthen the negative relationship between maternal employment and number of children 0-5. When there are many children under 5 in a village, improvement in economic development may reduce maternal employment. If policy makers want to maintain or raise maternal employment, they should create programs which can reduce the incompatibility such as provision of child care and flexible working environment.

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Conflict of interests

The author declare no conflict of interest

Availability of data and material

Susenas and Podes data sets can be downloaded from <https://silastik.bps.go.id>

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