The Monetary Value of Market Replaceable Household Production: An Empirical Study of the Economic Significance of Housewives' Roles

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Abstract

Economic theory in the household production literature suggests that the division of labor within households is based on the comparative advantage of specific investments and intrinsic biological differences between males and females. Males are typically regarded as breadwinners, whereas females are believed to be responsible for raising children and performing domestic work. Moreover, domestic tasks performed by housewives are not accorded enough economic significance; these tasks are also not included in the calculation of Gross Domestic Product and Gross National Product. This study aims to estimate the monetary value of the domestic tasks performed by housewives in urban Surakarta, Central Java, Indonesia. To this end, this study employs the general replacement cost approach. A primary survey of 385 respondents was conducted to collect information from housewives in Surakarta. The purposive sampling technique was used to generate a representative sample covering all five districts of Surakarta. The findings show that the average monthly monetary value of housewives in Surakarta is close to 2.5 million Rupiah. The monetary value varies according to the following parameters: age group, educational qualifications, age of children, and housewives' roles—that is, those who perform only domestic work and those who take up jobs in the public sphere in addition to performing domestic work.

Nilai Moneter Pasar Produksi Rumah Tangga: Studi Empiris Signifikansi Ekonomi Peran Ibu Rumah Tangga

Abstrak

Teori ekonomi dalam literatur produksi rumah tangga menjelaskan bahwa keluarga melakukan pembagian kerja berdasarkan keunggulan komparatif atas investasi spesifik dan perbedaan biologi antara laki-laki dan perempuan. Laki-laki memiliki peran sebagai pencari nafkah sedangkan perempuan sebagai ibu rumah tangga berperan untuk mengurus rumah tangga dan membesarkan anak. Kontribusi ibu rumah tangga dalam ekonomi tidak memiliki kontribusi nilai ekonomi misalnya dalam perhitungan produk domestic bruto. Studi ini bertujuan untuk mengukur nilai moneter atas pekerjaan domestik ibu rumah tangga di kota Surakarta yang merupakan kota terpadat di Jawa Tengah dengan menggunakan pendekatan general replacement cost. Penelitian ini menggunakan instrumen survei primer untuk mengumpulkan data-data 385 Ibu Rumah Tangga di Kota Surakarta. Pendekatan *purposive sampling* dipilih untuk memperoleh sampel yang mewakili ibu rumah tangga di lima kecamatan di Kota Surakarta. Penelitian ini menemukan bahwa nilai moneter untuk pekerjaan domestik adalah 2,5 juta rupiah per bulan secara rata-rata. Nilai moneter tersebut berbeda-beda untuk kelompok ibu rumah tangga dengan kelompok usia yang berbeda, latar belakang pendidikan yang berbeda, rumah tangga yang memiliki anak balita dan perempuan menikah yang menjalankan peran ganda sebagai pencari nafkah dan ibu rumah tangga.

1. Introduction

Indonesia values patriarchy. As a result, males are typically regarded as heads of the family—they are expected to direct other family members and maintain the family's resources and finance. In addition, the authority to take important family decisions typically rests with males (Retnowulandari, 2010). Javanese people, who

represent the largest ethnic group in Indonesia, also uphold patriarchy. Therefore, Javanese husbands are typically accorded more privilege and respect than their wives. In fact, the Javanese term *konco winking* means that husbands are typically supposed to be bread winners, whereas wives are supposed to work in the domestic sphere (Putri & Lestari, 2015).

Nonetheless, compared to the past, there is more equality among Javanese husband and wives today. This change is mainly reflected in the following spheres: family relationships, education, child care, and social interaction (Sumarno, Sumintarsih & Purwaningsih, 2013). As a result, the Javanese society accords importance to a different set of values today. For instance, married Javanese females are no longer confined to the domestic sphere; they have gained more access to the public space. Females have also gained more access to education, and the present-day married woman is more qualified than her precursors. As a result, more women have entered the labor market.

Increased access to higher education not with standing, married women are forced to decide between entering the labor market and becoming full-time housewives. Married women in urban areas typically have more opportunities to enter the labor market than married women living in rural areas. This is partly because gender equality is valued more in urban areas than in rural areas. This study focuses on married women in Surakarta, the most densely populated city in Central Java. According to a labor force survey conducted by the Indonesia Bureau of Statistics, the proportion of females aged 15 and above in the labor force is quite substantial (see Table 1): they constitute 60 percent of the workforce. This statistic also reflects the changes in marital relations—husbands and wives tend to be treated equally, and more than 50 percent of married females work in the public sphere.

Although the number of females aged 15 and above in the labor market has increased, their participation rate is still lower than the participation rate of their male counterparts. In Surakarta, more than 80 percent of males aged 15 and above participate in the labor market, whereas only 60 percent of females aged 15 and above participate in the labor market. This gap is partly due to the fact that large proportions of females aged 15 and above are housewives. The data reveals that, of the 40 percent of females who are not in the labor force, more than 25 percent are housewives. On the other hand, only 6 percent of males who are not in the labor force are househusbands.

In urban areas, females are typically forced to decide between working in the public sphere or becoming housewives. Surakarta has more than half million married females, and housewives aged 15 and above constitute 26 percent of the total female population in Surakarta. Primary data collected for this study reveals that nearly 70 percent of the sampled housewives were formerly employed in the public sphere, especially in the private sector. This statistic shows that females play a very important role in taking care of their families. The statistic also confirms that domestic work and childcare are typically seen as the main responsibilities of housewives. This in turn points to the prevalence of patriarchy despite the cultural changes that have enabled women to gain more access to education and employment.

This study aims to ascertain the economic value of the domestic work performed by housewives. It is necessary to do so since the domestic work performed by housewives is hardly accorded economic significance. Notably, domestic work performed by housewives does not have price information; neither do we know the economic worth of their domestic work. As a result, their contributions are not included in the calculation of GDP (Gross Domestic Product) or GNP (Gross National

Table 1. The Distribution of Population in Surakarta as of 2015 (of those aged 15 and above)

Population of those aged 15 and above	Male		Female		Total
	Population	**Proportion**	**Population**	**Proportion**	
Labor Force	**157,993**	**81%**	**126,083**	**60%**	**284,076**
Employed	149,012	77%	122,187	58%	271,199
Unemployed	8,981	4.5%	3,896	1.8%	12,877
Not in the Labor Force	**36,380**	**19%**	**84,651**	**40%**	**121,031**
Students	19,642	10%	22,108	10.5%	41,750
Housewife/ Househusband	*6,783*	*3.5%*	*55,252*	*26%*	*62,035*
Others	9,955	5%	7,291	3.6%	17,246
Total	**194,373**	**100%**	**210,734**	**100%**	**405,107**

Source: Badan Pusat Statistik. SAKERNAS 2015 (in Dinsosnakertans, 2016

Product) values (Chiswick, 1982). Nonetheless, third parties (such as domestic workers) provide domestic services at fairly substantial costs. Moreover, domestic help is more expensive in urban areas than in rural areas. The recent increase in the number of working mothers has led toan increased demand for domestic workers, which in turn has increased the cost of domestic help.

Division of Labor in Households. According to Becker (1991), economic theory assumes that a household consists of merely one member, and the theory does not consider the possibility of cooperation and conflict among family members. Further, the theory mainly focuses on the impact of changes in income and prices on households. In addition, the theory assumes that a household maximizes its utility by choosing how to consume a set of goods and by determining the amount of time to be spent working and on other activities. Households typically allocate separate times for working; personal activities, such as eating, sleeping, watching television, and domestic work, including cooking, cleaning, laundry etc. to ensure utility. Moreover, household utility is constrained by factors such as family budget and income. Blau & Ferber (1986) argued that families, much like other economic institutions, maximize their utility by selecting the best combination of commodities.

A household can achieve equilibrium by maximizing its utility in accordance with its budget constraints. Utility function reveals the utility generated through the consumption of a set of commodities and the allocation of working time. A family as a production unit is assumed to maximize their utility by considering their budget. The Thus, the family will maximize the number time spent for accomplishing home tasks, the number of goods and services purchased from the market with the constraints of the earnings generated from the labor market. (Blau & Ferber, 1986). The economic literature stipulates that households maximize the utility by equalizing the ratio of marginal utility generated through work and the consumption of a set of goods to the marginal rate of substitution between wages and price of goods. This equilibrium implies that an increase inwage rate will result in increased working time and demand for goods. On the other hand, a higher wage level will lower the time allocated for domestic activities (Becker, 1991). This proposition uncovers the relation between allocating time for formal work and domestic work. Time allocation (for formal work and domestic work) is determined by the wage level. A higher wage level induces households to allocate more time for working and vice versa.

The theory argues that there is a division of labor within households, which is based on the comparative advantages of the family members. Comparative advantage is defined as the gains that can be obtained from the specialized investments of each family member, namely husband and wife. Becker (1991) argued that the incentive for investing in improving either households or market productivity depends on the time allocation for each type of activity. If members of households spend more time for domestic work, the incentive for investing in household productivity is higher. The relationship between time allocation and incentive for investment can also be used to explain the relation between allocating time for working and the incentive for investment, especially in relation to improving the productivity of domestic work

Moreover, the economic theory argues that the division of labor within households is determined by intrinsic biological differences between husbands (males) and wives (females). Females, it is argued, have a bigger role to play in reproduction than males. As per this argument, males play no role in the reproductive process beyond fertilization. On the other hand, females carry, deliver, and breastfeed their babies. As a result, mothers are believed to be solely responsible for providing shelter caring for the new-born. Becker (1991) argued that women tend to prefer spending more time raising their children because they are more biologically invested in birthing than men. Ultimately, these arguments aim to show that housewives should perform more domestic work given their comparative advantage and intrinsic biological differences.

The Role of Housewives in Javanese Society. This section discusses the roles females are expected to play within a Javanese family and the cultural values shared by Javanese families, especially in relation to male-female relationships and the roles mothers are expected to play within a familial setup. As stated above section, according to economic theory, households select the best composition of commodities for consumption. either spending time for accomplishing household tasks or purchasing the services from the market. A family has some possible combinations of home time, the purchasing power of its family from the labor market earnings and the number of goods and services intended to consume (Blau & Ferber, 1986). To achieve maximum utility, each family member should either specialize in domestic work or develop competencies to enter the competitive labor market. Finally, family members' roles are based on their comparative advantage (Astuti, 2015).

The familial setup dealt with by the economic theory can be used to explain the husband-wife relationship within a Javanese family. In Javanese society, husbands are typically breadwinners, and they earn their income by working in the public sphere. Wives, on the other hand, are typically responsible for domestic work. Traditionally, females are considered more capable of performing domestic activities efficiently, whereas males, on account of their better education, are believed to possess a comparative advantage in the labor market. However, according to Astuti (2015), this sort of division of labor

can only be practiced by affluentor middle-class families. In poor families, married females are obligated, if not necessitated, to take part in the external production process to generate additional income. Given their economic conditions, Javanese families cannot rely on a single breadwinner. Therefore, Javanese wives are expected to simultaneously undertake domestic work and seek formal employment in the public sphere (Hayati, 2006).

Javanese culture accords mothers the central role within families. This is especially true in relation to childcare. Family members rely heavily on mothers, as they carry out the bulk of everyday domestic work. According to Tarbiyah (2009), a Javanese mother is responsible for taking care of her children and fulfilling their needs. According to Permanadeli (2015), housewives should be capable of raising children, socializing, and addressing the needs and interests of all family members. Javanese people use the following words to refer to the tasks performed by housewives: momong, momor, and momot. Housewives are required to manage the daily life of the family, including expenditure. They are also expected to fulfil the needs of other family members. In addition, mothers are expected to behave like role models, exemplifying values and practicing compassion. Mulder (1999) argues that mothers are capable of upholding their families' interest on account of their unconditional love and devotion.

However, a significant number of Javanese women and mothers take up jobs in the public sphere in addition to their domestic obligations. In addition, housewives are also required to socialize with neighbors. Interestingly, Permanadeli (2015) conclusively shows that Javanese housewives perform more than just domestic work. Through their neighborly and social obligations and roles, housewives contribute to the safety and strengthening of society. As per Notopuro (1979), housewives contribute to the creation of a better society by managing, controlling, and taking the effort to create a harmonious family.

The Javanese saying "Wong Wadon Kudu Srawung" suggests that housewives must be capable of engaging with the society (Permanadeli, 2015). Moreover, Newberry (2013) suggests that housewives can play an important role in transmitting the state's instructions and orders to their family and society. In fact, local governments in Indonesia actively seek to involve housewives in order to generate more support for their programs.

2. Methods

Modeling and Valuing Household Production. Household production is excluded from the calculation of GNP values. Quah (1993) points out that this method was severely criticized during the late 1960s and early 1970s. Household productionis excluded from the national product because its goods and services do not enter the market. In domestic work, family members create products and render services, and these are consumed domestically by other family members. As they are not traded in the market, household products do not have market value either. However, the value added generated by hired domestic help is included in the national product. This points to the inconsistencies in the calculation of national product.

Scholars have made a number of attempts to resolve this issue. First, studies aimed to define economic activity carried out within households as household production. Reid (1934) is widely credited for having introduced the concept of household production. In his book, Economics of Household Production, Reid (1934) suggested that any unpaid activity carried out by and for members of a household would constitute household production as long as the activities can be performed by hired help. Walker & Woods (1976), Gronau (1977) and Hawyrlyshyn (1978) have also developed similar arguments. Walker & Woods (1976) defined household production as those activities conducted within individual households with the aim of producing goods and services in order to facilitate the full functioning of the household. In the same context, Gronau (1977) sought to differentiate between work and leisure. Interestingly, the difference between work (at home) and leisure depends on the willingness of household members to delegate somebody else to perform domestic work. Gronau (1977) argued that while people would prefer somebody else to perform their domestic tasks, they would want to perform their leisure activities themselves. Hawyrlyshyn (1978) strengthened this concept by citing people's willingness to hire domestic help; the author also noted that delegating housework to somebody else would not change the utility generated by household production.

Beutler and Owen (1980) underlined the importance of identifying household products that can be replaced by services and goods offered in the market. Domestic cleaning is a relevant example in this context, as families can hire professional cleaners. In sum, scholars have focused on two types of activities, namely market replaceable household production (MHP) and near-market replaceable household production (NMHP). MHP mainly includes domestic activities such as cleaning, laundry, and cooking. Notably, these activities can be performed by hired help also. NMHP includes unpaid domestic activities that involve special skills and capabilities, such as tutoring children.

The valuation of household production is mainly performed using two methods. The first method relies on the expenditure approach, and the second utilizes the income approach. In the expenditure approach, household production is evaluated by measuring the total output

produced by households, assuming that these can be sold to the market. On the other hand, the income approach employs the resource input information. More specifically, it values the number of resource inputs employed for household production. Both approaches assume that household production is similar to firm production—that is, they assume that (i) households produce goods and services using goods purchased in the market, and (ii) family members allocate time for producing these good and services themselves.

The main advantage of the expenditure approach is its capacity to directly measure the quantity of output produced by households. However, the approach has a number of technical and application-related issues, which make it difficult to conduct an empirical evaluation. As per Quah (1993), one of the biggest limitations in this context is the unavailability of common units to measure the total output produced by households. In addition, very few aspects of market price information reflect the value of household production. Moreover, many tangible and intangible goods and services produced by households cannot be found in the market—for example, clean floors, made beds, and disciplined children. Finally, the operationalization of the expenditure approach is a demanding process. The expenditure approach requires detailed and accurate information about products produced by households, including the types of products, the related cost incurred to produce the product, and similar products sold in the market (Quah, 1993). Moreover, by examining the strengths and weaknesses of the two approaches, Quah (1993) has shown that the income approach is superior to the expenditure approach.

The income approach is also known as "input-related evaluation," as it deals with the values of all resource inputs used in household production. There are two main inputs required for household production: (i) goods and services purchased in the market and (ii) time taken by members of the household to complete their tasks. Recent studies have largely focused on the time taken by households to produce goods and services in the households. The approach is appropriate because the measure of GNP does not include the time spent by households to produce goods and services (Quah, 1993). Meanwhile, the GNP calculation includes the values of goods and services households purchased in the market as an input. Therefore, focusing on time allocation of households' production as the sole input in the production process in the households, this approach prevents the risk of having the double counting of goods and services purchased from the market.

The General Replacement Cost Approach (GRC).
This study employs the general replacement cost approach to measure the monetary value of the domestic work performed by housewives. Replacement cost refers to

the cost involved in hiring another person to accomplish the same tasks. More specifically, this study employs the second variant of the replacement cost approach. As described by Quah (1993), the second variant assumes that there is no division, classification, or breaking down of activities. That is, it assumes that housekeeping tasks are not broken down into several daily activities, as is the case with the first variant. Therefore, this approach is particularly useful for managing the joint activities issue prevalent in household production, which is characterized by housewives' occasional tendency to undertake two or more tasks simultaneously. By combining all activities related to domestic housekeeping as one type of household production, this study limits the risk of undervaluing or overvaluing the inputs of time.

Notably, this study relies on the wage information of public workers who also perform domestic work. In addition, this study deals with MHP, which is related to child raising and child assisting, especially in the context of learning. Indonesian families typically hire babysitters, and, in addition to care-giving, babysitters are also expected to tutor children. Therefore, as suggested by Puspitawati (2009), this study also regards tutoring and babysitting as activities that are directly related to household production. Puspitawati (2009) also recommends employing the wage information domestic assistant as a predicted price of housewives' completion of housekeeping tasks. In addition, babysitters' wage information is regarded as a predicted price of child raising-related activities performed by housewives. Finally, private tutors' wage information is regarded as a predicted price of housewives' involvement in child assistance, especially in terms of tutoring. The different types of wage information were collected from private service providers in Surakarta, who specialize in providing domestic assistance and babysitting and private tutoring services.

In addition, we also collected information related to time allocation for productive activities. It is necessary to examine the significance of the additional income generated by housewives who work from home. Recently, there has been an increase in the number of housewives with their own home-based business, as well as in the number of housewives who casually work for someone else. Housewives' participation in income-generating activities may impact the time they devote to domestic work. Therefore, weal so collected information pertaining to the estimated monthly income generated from productive home-based activities. The formula used to calculate the monetary value of housewives (for instance, the costs involved in hiring domestic help in Surakarta) is as follows:

Housewives' Monetary Value = (t1 * p1) + (t2 * p2) + (t3 * p3) eq. 1

Table 2. lists the definition of each variable.

Sampling Design and Data Collection. This study aims to determine the monetary value of housewives' lives in urban Surakarta, the most densely populated city in Central Java, Indonesia. Surakarta is divided into five districts: Laweyan, Serengan, Pasar Kliwon, Jebres, and Banjarsari. The proportion of housewives across the districts is varied. Banjarsari district has the highest number of housewives, whereas Serengan district has the lowest number of housewives. More than fifty percent of the housewives in Surakarta are located in Banjarsari and Jebres. The number of housewives in a given district was also found to be influenced by district size. For instance, not only was Banjarsari the district with the highest number of housewives in Surakarta but it was also the largest district in Surakarta. According to Dinas Kependudukan dan Catatan Sipil as of 2015, the city of Surakarta had as many as 57,546 married females aged between 15 and 65. This study employed the purposive sampling technique to collect information from housewives in Surakarta.

The purposive technique was especially useful in the context of this study as it enabled researchers to cover all districts in Surakarta. As a result, we were able to access, analyze, and present data about housewives from all five districts of Surakarta. In addition, to represent housewives from all five districts equally, the proportion of the sample across districts was aligned with the population information (see Table 3): 33.99 percent of the sample was located in Banjarsari, 23.77 percent in Jebres, 16.74 percent in Pasar Kliwon, 16.63 percent in Laweyan, and 8.87 percent in Serengan. Samples consisted of married females, especially housewives, and husbands and wives were aged between 15 and 65. We selected as many as 385 samples using the purposive sampling technique to meet the minimum requirement for sampling a population (i) higher than 50,000 and (ii) with a confidence interval of 95 percent (Sekaran, 2003).

According to the population data, more than 40 percent of the females aged between 15 to 65 did not or could not pursue formal education after junior high school. This implies that the female education rates in Surakarta are relatively low, and this in turn may have negatively affected females' competence and skill levels. Around 36 percent of the population completed senior high school, and around 9 percent have Diploma I and certificates. Thus, more than 45 percent of the females in Surakarta have senior higher secondary education, whereas the remaining 10 percent has a tertiary degree (see Table 4).

In addition, this study considers an equal number of educated and uneducated housewives, as it mainly aims to compare the monetary values of these two groups. In other words, the sample from each area consists of an

Table 2. Description of the Variable of General Replacement Cost Approach

Symbol	Definition
t_1	Amount of time spent in housekeeping activities, such as cleaning, laundry, cooking etc. (average number of hours in a day).
t_2	Amount of time spent in child raising related activities (average number of hours in a day).
t_3	Amount of time spent tutoring children (average number of hours in a day).
p_1	Price of domestic assistants (wages per hour)
p_2	Price of babysitter (wages per hour)
p_3	Price of private tutor (wages per hour)

Note: The price information of domestic assistants and babysitter was collected from the housemaid agency PT. Esma Aliya Utama in Surakarta. The monthly wage of a housemaid was 1.2 million Rupiah. The monthly wage of a babysitter was1.5 million Rupiah. The price information of private tutor was obtained from Ms. Mona Muriyani, a private tutor. The wage of a primary school tutor was 20,000 per meeting, whereas the wage of junior high school tutor was 35,000 per meeting. The wage for high school tutor was 50,000 per meeting. This study, however, employs only the price information of primary school tutors

Table 3. Population of the City of Surakarta across Districts (as of 2015)

No.	District	Male	Female	Total Population	Households number	Percentage of households in each district (%)
1.	Banjarsari	78,628	82,741	161,369	19,560	33.99
2.	Jebres	68,436	73,178	141,614	13,678	23.77
3.	Pasar Kliwon	37,593	38,591	76,184	9,635	16.74
4.	Laweyan	42,838	45,440	88,278	9,569	16.63
5.	Serengan	21,618	23,163	44,781	5,104	8.87
	Total	**249,113**	**263,113**	**512,226**	**55,546**	**100**

Source: Surakarta in Numbers (2016) and Dinas Kependudukan dan Catatan Sipil Kota Surakarta

equal number of educated and uneducated housewives. This study regard seducated housewives as those who completed at least senior high school, and housewives with lesser educational qualifications are regarded as uneducated. Finally, the sample also consists of an equal number of housewives (i) aged 40 and above and (i) aged 40 and lower (see Table 5).

Data for this study was collected in March, 2017. We collected data through a survey, which required participants to complete a set of questionnaires. We recruited five participants to conduct a pilot version of the survey to test the reliability of the questionnaire. We also hired five interviewers to assist with data collection. The survey was mostly conducted during day time

Table 4. Population of Females aged between 15 and 65 in Surakarta and their Educational Qualification

No.	Education Background	Total	Proportion to total population (%)
1	Uneducated	616	1.07
2	Incomplete primary education	1,401	2.43
3	Completed primary education	9,962	17.31
4	Junior High School	13,066	22.71
5	Senior High School	20,912	36.34
6	Diploma I/II	5,402	9.39
7	Diploma III	2,175	3.78
8	Diploma IV/ Undergraduate	3,281	5.70
9	Master Degree	708	1.23
10	Doctorate Degree	23	0.04
	TOTAL	**57,546**	**100**

Source: Dinas Kependudukan dan Catatan Sipil Kota Surakarta

Table 5. Sampling Information of Housewives in Surakarta across Five Districts (as of 2016)

Districts	Area	Sample	Age	Educated	Uneducated
Laweyan	Pajang	32	Younger than 40 y.o Older than 40 y.o	8 8	8 8
	Jajar	32	Younger than 40 y.o Older than 40 y.o	8 8	8 8
Serengan	Tipes	17	Younger than 40 y.o Older than 40 y.o	5 4	4 4
	Serengan	17	Younger than 40 y.o Older than 40 y.o	4 4	4 5
Pasar Kliwon	Semanggi	32	Younger than 40 y.o Older than 40 y.o	8 8	8 8
	Joyosuran	32	Younger than 40 y.o Older than 40 y.o	8 8	8 8
Jebres	Mojosongo	46	Younger than 40 y.o Older than 40 y.o	12 12	11 11
	Jebres	46	Younger than 40 y.o Older than 40 y.o	11 11	12 12
Banjarsari	Kadipiro	66	Younger than 40 y.o Older than 40 y.o	17 16	16 17
	Nusukan	65	Younger than 40 y.o Older than 40 y.o	16 17	16 16
Total Sample		**385**		**193**	**192**

between 9:00 hours and 14:00 hours, as respondents were available only during school hours. The interviewers visited each household to collect relevant information from housewives. Prior to the home visits, we collected information pertaining to the distribution of housewives in the regions and other demographic data from local officials.

3.   Results

Table 6 presents the descriptive statistics of some important variables. It shows that the average age of the respondents is around 42. This study also regards family size, especially the number of children, as an important factor. On average, housewives were found to have 2 children. Notably, the largest family had 7 children. The age of the youngest child is also useful to understand the nature of time allocation, especially for child raising and tutoring-related activities. The average age of the youngest child was found to be 10 (median value). On the other hand, mean values showed that the average age of the youngest child was 11. In addition, the percentage of families with young children is relatively large: 22 percent of the housewives had children aged three and below.

In terms of MHP (Table 7), housewives spent an average of 4.15 hours a day for housekeeping. In addition, around 5.66 hours were spent on activities related to child raising and assisting children with learning. Housewives also spent 4.26 hours per day caring for their children and 1.4 hours per day assisting them with learning. In addition, housewives in Surakarta also spent an average of 2.91 hours per day on productive, home-based activities. The rest of their time was divided between personal tasks, social activities, and leisure.

By using the general replacement cost approach, this study found the monetary value of housekeeping to be 721,987 Rupiah per month, assuming that (i) housewives spend 4.15 hours on housekeeping daily and (ii) the cost per hour is 5,800 Rupiah. The average monthly monetary value of child raising was found to be 919,542 Rupiah, whereas the average monthly monetary value of assisting children in learning activities was found to be 844,675 Rupiah. Thus, the total monthly monetary cost of child rearing is 1,764,217 Rupiah. In terms of MHP, especially in relation to housekeeping and child-rearing, the total monetary value of housewives in Surakarta is 2,486,204 Rupiah per month.

The data reveals that housewives perform more than just domestic work, as they also spent approximately 3 hours on home-based productive activities. In fact, more than 60 percent of the participants declared that they performed productive activities, which means that they earned income from those activities. On average, housewives are capable of generating of 967,638 Rupiah from productive activities. Thus, on average, the total monthly monetary value of housewives is 3,453,842 Rupiah, of which approximately 2.5 million Rupiah is related to domestic work and 970,000 Rupiah is related to other productive activities.

Further, this study explores the variation of MPH across different groups of housewives. It is, therefore, necessary to identify the factors that contribute to the variation of MPH. We performed the t-test to gauge the equality of means across two groups (Table 8). To this end, we tested the two-sample tests of the unpaired two-sample case, where the assumption of equal variances was relaxed. In the first exploration using family size measures, we defined small families as small households with one to four family members. The t-test showed that both groups spent approximately 10 hours on domestic tasks, and the difference of means across the two groups was not statistically significant. This implies that family size may not be the most crucial factor in relation to time allocation for MPH. Larger families had more domestic tasks, but responsibility for the tasks was shared among the family members.

The variation of MPH can be explained by the age of the housewives. Older housewives, especially those aged forty and above, spent more time on domestic tasks. The average difference in the amount of time devoted to MHP was found to be 2 hours, and this difference was also

Table 6. Descriptive Statistics of the Sample

Variable	Means	Median	Standard deviation	Minimum	Maximum	Sample size
Age	41.98	41	10.16	20	64	385
Number of children	2.21	2	1.08	0	7	385
The age of the youngest child	11.85	10	9.48	Less than 1 year	48	384
Housekeeping	4.15	4	1.65	1	15	385
Looking after children	4.26	4	2.76	0	15	385
Assisting children in learning	1.4	1	0.98	0	7	385
Productive	2.91	3	2.95	0	16	385
Others						
Personal	7.71	8	1.78	1	13	385
Social activities	1.57	1.5	1.02	0	7	385
Leisure	1.99	2	1.21	0	8	385

Table 7. The Monetary Values of Housewives

No	Domestic work	Daily average	Proportion (in percent)	Salary per hour	Number of days	Monthly Domestic Price
1	Housekeeping	4.15	17.75	5,800	30	721,987
2	Looking after children	4.26	17.29	7,200	30	919,542
3	Assisting children with learning	1.4	5.87	20,000	30	844,675
	Market replaceable household production (MPH)	*9.81*	*41*	*-*	*30*	*2,486,204*
4	Productive	2.91	12.12	-	-	776,623*
5	Others					
	Personal	*7.71*	*32.12*	*-*	*-*	*-*
	Social activities	*1.57*	*6.54*			
	Leisure	*1.99*	*8.29*			
	Total	**24**	**100**			**3,262,827**

Note: The number of respondents was 385; the time calculation is based on participants' recollection of previous day's activities (1*24 hours).
* This figure is based on the predicted average income of respondents involved in home-based productive activity.
Source: Authors' calculation

Table 8. Market Replaceable Household Production across Family Size and Age Groups

Time spent on domestic work (daily average)	Family size		Mothers' age	
	Small (1-4)	Large (≥5)	Young (<40 y.o)	Old (≥40 y.o)
Housekeeping	4.17	3.93	4.09	4.20
Looking after children	4.24	4.37	5.18	3.45
Assisting children with learning	1.41	1.41	1.66	1.18
Total MHP*	**9.83**	**9.71**	**10.94**	**8.83**
N	38	347	205	180
Means difference across groups	0.12		2.11	
t-test for means difference test	0.2205		7.19	
Probability to reject H0	0.8256		0.00	

statistically significant. Younger housewives spent more time looking after their children than older housewives. More specifically, younger house-wives allocated 1.73 more hours for childcare than older housewives. MHP was also found to be higher for families with young children (Table 9). By comparing the means of MHP between families with young children and families with older children, this study found that families with toddlers aged between 1 and 3 spent more time on domestic tasks. On average, these families spent 2.5 hours more than other families to take care of their young children. with learning than those with lower qualifications. This may also explain in the difference in the monetary values of housewives —a difference of 144,000 per month.

Educated housewives spent more time helping their children to master academic concepts. In fact, educated housewives were also found to be more capable to accomplish this task. They also believe that this task directly benefits their children. In relation to spouses'

working status, this study found that 4 percent (about 15 households) of the heads of households were unemployed. MHP was lower in these families than in families with employed spouses. The domestic tasks may also be distributed between wives and husbands. As a result, the amount of time housewives spent on household production was lower. Table 10 shows that MHP is 2.5 hours lesser in families with unemployed husbands. This difference is statistically significant and was observed across different domestic tasks, including housekeeping and childcare related activities.

The data also shows that in all 15 households in which husbands were unemployed, housewives performed domestic tasks and functioned as the sole breadwinner. Table 11 shows that they undertook productive activities from home to generate income. This may explain the lower MHP of this group (compared to households in which husbands were employed). Housewives who undertook home-based income-generating activities

Table 9. Market Replaceable Household Production across Families with Young Children

No	Time spent on domestic work (daily average)	Families with Infants (0-12 months)		Families with Toddlers (1-3 y.o)		Families with Preschool Children(3-5 y.o)	
		Have infant	None	Have toddler	None	Have pre-schooler	None
1	Housekeeping	3.90	4.16	4.45	4.12	3.83	4.17
2	Looking after children	4.84	4.23	5.97	4.11	4.79	4.23
3	Assisting children with learning	0.68	1.44	1.65	1.39	1.62	1.40
	Total MHP*	**9.83**	**9.42**	**12.07**	**9.63**	**10.24**	**9.79**
	Sample size (n)	19	366	30	355	364	21
	Means difference across groups	0.41		2.44		0.45	
	t-test for means difference test	0.58		4.30		0.90	
	Probability to reject H0	0.57		0.00		0.51	

* MHP stands for market replaceable household production
Source: Authors' calculation

Table 10. Market Replaceable Household Production across Housewives with Different Educational Qualifications and Spouses' Working Status

No	Time spent on domestic work (daily average)	Housewife's Education level			Husbands' working status		
		Less education (lower than senior high school)	High education (senior high school and above)	Means difference across group	Unemployed	Employed	Means difference across group
1	Housekeeping	4.02	4.28	-0.26; (t-test: -1.56) prob. 0.12	3.60	4.17	-0.52; (t-test: -1.31) prob. 0.19
2	Looking after children	4.21	4.30	0.087; (t-test: -0.31) prob. 0.76	2.97	4.31	-1.34; (t-test: -1.86) prob. 0.06
3	Assisting children with learning	1.29	1.53	0.24; (t-test: 2.37) prob. 0.02	0.87	1.43	-0.56; (t-test: -2.18) prob. 0.03
	Total MHP*	**9.52**	**10.11**		7.43	9.91	
	Sample size (n)	192	193		15	370	
	Means difference across groups	-0.59			-2.48		
	t-test for means difference test	-1.89			-3.11		
	Probability to reject H0	0.06			0.002		

Source: Authors' calculation

Table 11. Market Replaceable Household Production of Housewives who Undertook Productive Activities

Time spent on domestic work (daily average)	Housewives who also work from home		
	No	Yes	Means difference across group
Housekeeping	4.67	3.85	0.82; (t-test: 4.85); prob. 0.00
Looking after children	5.32	3.64	1.68; (t-test: 6.03); prob. 0.00
Assisting children with learning	1.59	1.30	0.29; (t-test: 2.77); prob. 0.00
Total MHP*	**11.57**	**8.79**	
Productive **	**-**	**4.61**	
Sample size (n)	**142**	**243**	
Husbands' working status	**All employed**	**Employed: 228 (94%)** **Unemployed: 15 (6%)**	

Table 12. The Monetary Value of Housewives Across Factors such as Age and Educational Qualification

Age/ Education	Educated (Senior Secondary School and higher)	Uneducated (Lower than Senior Secondary School)
Aged 40 and Younger	Rp 2,835,340	Rp 2,761,263
Aged 40 and Above	Rp 2,326,702	Rp 2,029,727

Source: Authors' calculation

spent close to 5 hours on their business, and this prevent them from allocating more time for domestic tasks. Therefore, their MHP was 3 hours less than the MHP of full-time housewives.

This study aims to measure the monetary value of housewives across factors such as education qualification and age. The data confirms that educated housewives recorded higher monetary values than uneducated housewives. The monetary value of averagely educated housewives aged 40 and younger was more than 2.84 million Rupiah. Meanwhile, uneducated housewives aged 40 and above had the lowest monetary value: 2 million Rupiah. Younger, more educated housewives spent more time on child-rearing activities as they typically had younger children. The data also reveals that these housewives tend to allocate more time for domestic activities, especially for housekeeping and child rearing-related activities.

4. Discussion

Housewives' economic contributions are largely undervalued, and their participation in the economy is also not included in the calculation of GDP (Gross Domestic Product) values. However, the typical housewife undertakes domestic work and performs various roles in the social sphere. Housewives make significant economic contributions as they perform a wide range of domestic chores. Moreover, the economic value of the domestic tasks performed by housewives increases within creased demand for domestic assistance in urban areas. This study aims to measure the monetary value of housewives in urban areas, and, by doing so, it aims to address the gap in the literature pertaining to the study of households. Notably, the previous study focused on the measurement of the monetary value of married females in rural areas. Moreover, given the patrilineal nature of Javanese society and given the positioning of the male as breadwinner and the female as housewife, it is important to measure the economic contributions made by married females.

Employing the general replacement cost approach, this study shows that the average monetary value of domestic work performed by housewives in the city of Surakarta is 2.5 million Rupiah. The value is even higher for an educated housewives aged 40 and below. Their monetary

value is close to 3.6 million Rupiah. In terms of monetary value, this study found that the valuation of domestic work is higher than the minimum wage in the city of Surakarta, which is 1.3 million Rupiah per month. Therefore, the monetary value of housewives is much higher than the minimum wages offered for formal jobs. Data pertaining to the education qualifications of married females in Surakarta shows that only 50 percent of housewives were educated beyond the junior high school level. Therefore, educated housewives who enter the labor market are bound to earn the minimum wages. Nonetheless, the monetary value of housewives is higher than minimum wages offered in the formal sector. Housewives also tend to have more skills than the formally employed.

This study also examines the difference in housewives' monetary values in relation to factors such as age groups and educational qualifications. Given the average monetary value of domestic work, educational qualification and age may explain the difference in monetary values. In particular, younger, more educated housewives have higher monetary values than older, less educated housewives. This difference is mainly due to the fact that the former allocate more time for child raising-related activities and domestic work, as they typically have younger children.

On average, housewives spend nearly 18 percent of their time on housekeeping, and more than 23 percent of their time is dedicated to raising their children. Housewives were also found to be actively involved in productive activities, and they typically spent 12 percent of their time on these activities every day. This indicates that urban housewives can earn some income by participating in productive activities from home. By working for an average of 3 hours every day, housewives in urban Surakarta were able to generate an additional income of 967,638 Rupiah. This finding shows that married females who choose to become housewives can undertake productive activities and earn as much as the minimum wages offered in the formal sector.

In addition, being a housewife allows married females to spend 1.5 hours every day for social activities, which is approximately 7 percent of their total daily time. This also supports the claim that the work performed by Javanese housewives extends beyond the domestic

sphere. Housewives tend to participate in social activities such as organizing basic health care services for children and senior citizens, initiating and conducting female empowerment programs at the neighborhood level, conducting spiritual activities, and supporting local and central government programs. Their participation in these social activities also ensures strength and security of the Javanese society.

5. Conclusion

Housewives make substantial contributions to the economy by performing domestic work. This study found that housewives spend almost 40 percent of their time on household activities, including housekeeping and activities related to child raising. Younger housewives spent more time on domestic tasks, especially on activities related to child raising, than older housewives. This is mainly because younger housewives tend to have younger children, and younger children require more attention than older children. Educated housewives also spent more time helping their children with education. Meanwhile, housewives who were also breadwinners spent less time on domestic tasks. This is mainly because they were required to balance their domestic tasks with home-based income-generating activities.

The average monthly monetary value of market replace-able household production in urban Surakarta is 2,486,204 Rupiah, of which 722,000 Rupiah are related to house-keeping, about 920,000 to childcare, and 845,000 to assisting children with learning. In addition, housewives in Surakarta generated an average additional income of 776,000 Rupiah from home-based productive activities. The monetary value of averagely educated housewives aged 40 and younger was more than 2.8 million Rupiah. On the other hand, uneducated housewives aged 40 and above had the lowest monetary value: 2 million Rupiah.

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