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Female Labour Force Participation and the Prices of Household Durable Goods: A Philippine Study

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Abstract

This paper investigated whether a decrease in the prices of household durable goods increases the Female Labour Force Participation (FLFP) in the Philippines. The paper used the theoretical model of Pirani, Leon, and Lugauers (2010), who theorized that a decrease in the prices of household appliances would increase FLFP due to their time being freed up for non-household tasks. To study this, the regression model of Cavalcanti and Tavares (2008) was used to test the hypothesis. The results of this paper were consistent with the theoretical and empirical results from the two models.

Keywords

Female Labour Force Participation, Durable Goods, Household Appliances.

CHAPTER I

INTRODUCTION

A. Statement of the Research Question

This research paper examines the following research question: Does a decrease in the prices of household durable goods increase female labour force participation in the Philippines?

B. Significance of the Research Question

Longitudinal research (Zipp and Plutzer, 2000) has shown that participating in the labour force changes the way women perceive their class identity. With work, women were more able to view their social status as an individual, rather than identifying with that of their husbands (Zipp and Plutzer, 2000). Nonetheless, sociological studies (Coltrane, 2004) have found that the change towards gender equality in the labour force is slow, even for elite careers such as medicine, law, and banking. This was attributed to the persistence of an unequal home labour sharing scheme, which puts a greater burden of housework and family care on women (Coltrane, 2004). One possible means of mitigating this burden was through laboursaving technology, in the form of home appliances (Cavalcanti and Tavares, 2008). While many studies exploring the relationship of the price of household appliances and female labour force participation have taken place in developed countries or with primary data from surveys, there was a lack

of examination for the link between the price of household durable goods, of which appliances are a part, and the ability for women to participate in the work force in the context of the Philippines.

C. Scope and Limitations

This paper examined the link between the price of household durable goods and the ability for women to participate in the labour force. The analysis was based on the theoretical model of Coen-Pirani, Leon, and Lugauer (2008), who represented a woman's labour supply decision as a utility function affected by the consumption of market goods and household-produced goods. As such, the main variable of interest was the price of household appliances and female labour force participation. The econometric model that served as the basis of the study's econometric analysis was that of Cavalcanti and Tavares (2008), who made use of panel data from European countries and the United States from 1975 to 1999. Aside from the main variables of interest, other variables were average male income, real gross domestic product (GDP) growth rate, government share of GDP expenditure, and share of urban population (Cavalcanti and Tavares, 2008). As such, the study will be limited to these variables for its analysis.

The paper covered only secondary data from the Philippines. As the data needed to derive certain variables of interest (the price of household durable goods and female labour force participation) were found in quarterly form, while other data were not, some transformation of annual data was undertaken in order

to use quarterly data for analysis. Additionally, one of the variables from the econometric model, average male income, was proxied with male employment, as local data for income by gender were not available.

Rather than a study that made use of cross-sectional or panel data across various South East Asian countries, the study made use of time-series data from the Philippines. This was because the variable of interest required data from price indices. Not all countries have the same basket of goods in their price indices, nor do they publish this data publicly. The Cavalcanti and Tavares study, from which the model was adopted, used OECD countries in their panel data, where the published data are relatively more uniform. As such, the study made use of only Philippine data to remain consistent.

While conventional labour supply models may have presented female labour supply as a function of female wage, this variable was not present in the Cavalcanti and Tavares model. It may be inferred, though, that in lieu of female wage, GDP growth rate was used to represent how well the economy was doing and, consequently, how much women were paid.

D. Methodology

Noted in the previous section, the model used for the study was that of Cavalcanti and Tavares (2008). As in the original study, ordinary-least squares (Cavalcanti and Tavares, 2008) was used to estimate the model. To further specify the model, Ramsey's RESET for squares was used to check for missing terms.

Other econometric tests included testing for the normality of the residuals, and testing variance inflation factors for collinearity. White test and Breusch-Pagan test were used to test for heteroscedasticity. Finally, because the data were in quarterly format, seasonal unit root test was used. All the data, with the exception of the share of urban population, were from the 2001 to 2016 Philippine Statistical Yearbooks, while the share of urban population data were acquired from the World Bank.

E. Definition of Terms

The information of interest for the research question was the price of household durable goods and female labour force participation. The former was expressed as the quarterly ratio of Philippine household products price index (HPI) and consumer price index (CPI) from 1999 to 2015, as published in the Philippine Statistical Yearbooks from 2001 to 2016. Female labour force participation was expressed as the quarterly share of employed and unemployed females over the total Philippine labour force, for the years 1999 to 2015, also published in the Philippine Statistical Yearbooks from 2001 to 2016. Both definitions were based on the Cavalcanti and Tavares (2008) study.

CHAPTER II

REVIEW OF RELATED LITERATURE

A literature search was undertaken to find relevant policy issues, theoretical models, and econometric models for the study. The first section detailed policy issues pertaining to women in the workforce, theories as to how women choose to enter the labour force, and the effects of women choosing to work. The second section described three theoretical models used to explain the factors that affect the choice of a woman to supply labour. The final section presented three econometric models that were used to study the relationship between the prices of household appliances and female labour force participation in various contexts.

Policy Issues

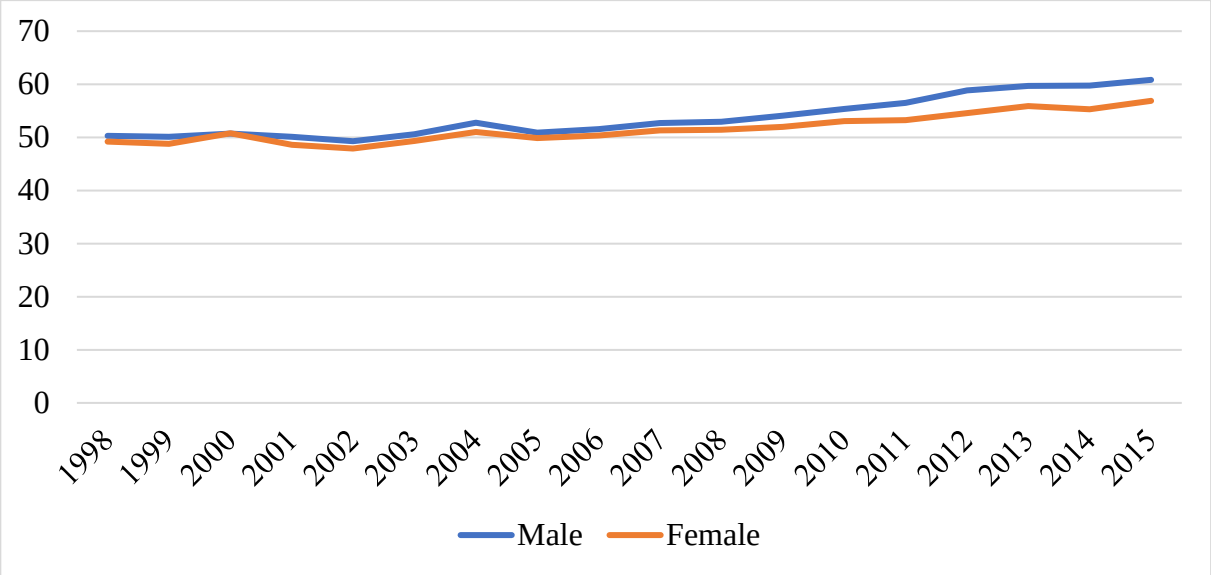
For women, acquiring their own financial resources plays an important role in reducing vulnerabilities, providing decision-making capacity, and improving well-being for them and their families (Swain and Wallentin, 2009). Access to formal labour can greatly aid in women's achieving financial independence. Although there have been great strides in fostering a global environment conducive to the participation of women in the public sphere, the transition towards more gender equality in the workforce and a more equal division of household labour has slowed (Coltrane, 2004).

The graph below shows that there has been a general increase in the share of salaried women in the Philippines (World Bank, 2017). Wages and salaries

indicate a standard, if not steady, source of income for women. Nonetheless, the highest recorded share of salaried women out of all employed women is about 57% as presented in Figure 2.1.1.

Figure 2.1.1.

Share Salaried Workers from employed Workers (%) by Sex (Philippines, 1998-2015).



Source of Basic Data: The World Bank 2017.

The graph shows that almost half of all employed women in the Philippines are not working for regular salary. Despite gains in female employment, women in the country may still be lagging in terms of purchasing power or having a steady disposal income for products that may directly benefit them and their roles, including that of home-management. This is made more evident when the data are compared to the share of male wage and salaried workers from total employed males, also presented in Figure 2.1.1. While the share of salaried males and females in the Philippines started out with a smaller

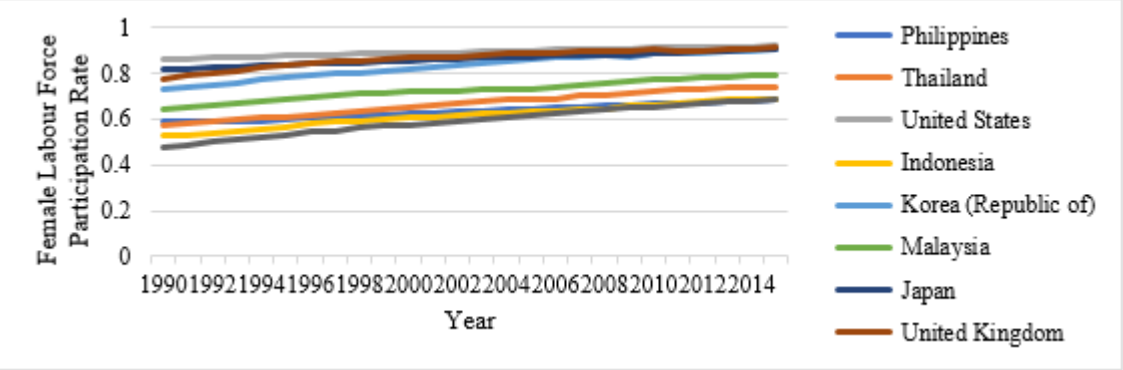
difference, in the last ten years, the share of salaried males have increased more than that of females.

Observing data among different countries, it is not only salaried females but also female labour force participation in general that has not been increasing greatly in the last decade. This is presented in Figure 2.1.2. below.

Figure 2.1.2

Female Labour Force Participation Rate in Selected Countries 1990-2015

(%)



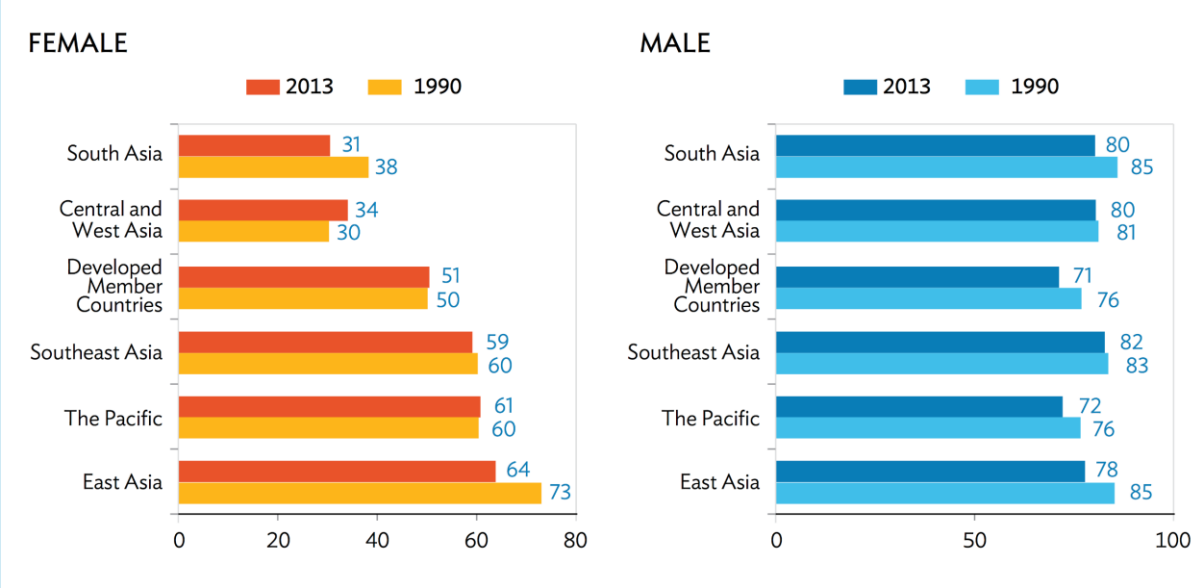
Source of Basic Data: United Nations Development Programme 2017.

More specifically, female labour force participation (FLFP) rate remains below that of male labour force participation rate in Asia, though ADB (2015, 4)

has interpreted the information in Figure 2.1.3 to mean the participation rates are converging.

Figure 2.1.3

Female and Male Labour Force Participation rates 1990 and 2003 (%)

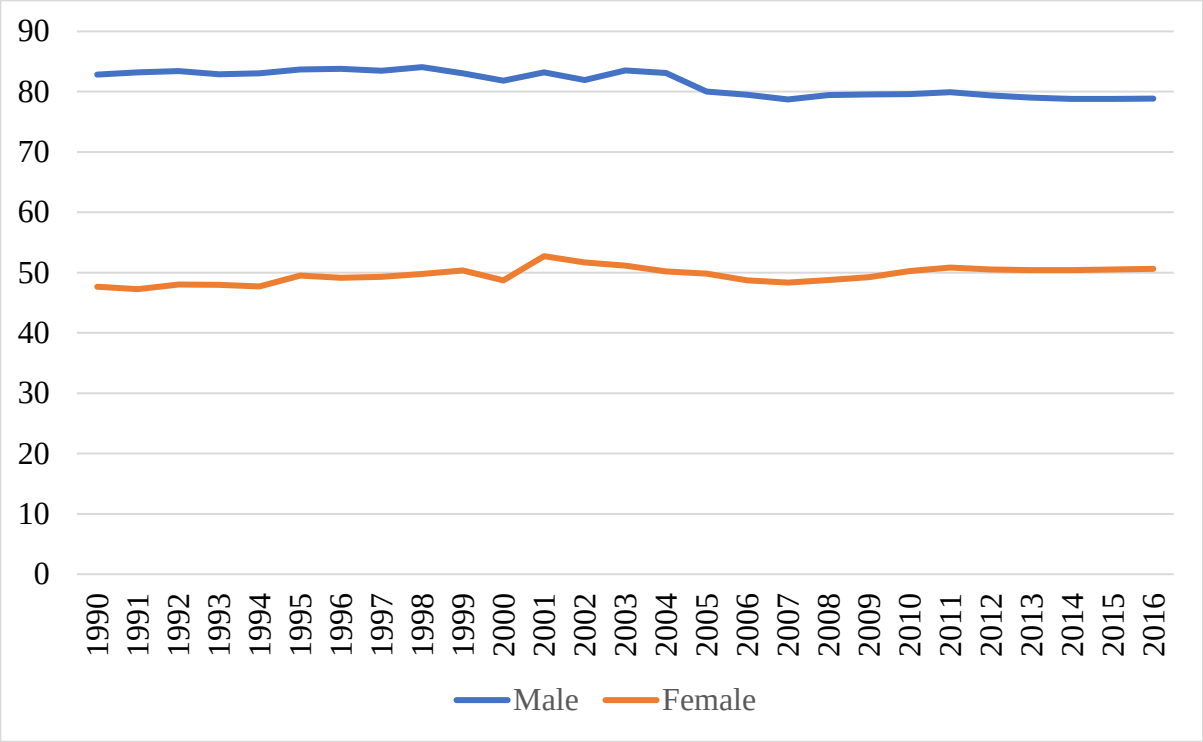


Source: Asian Development Bank 2015, p. 4.

Turning to more recent data from the Philippines, this is not the case. While the general trend has been that male labour force participation rate has decreased over the last 15 years and FLFP rate has increased, FLFP is still more than 30% below its male counterpart.

Figure 2.1.4

Male and Female Labour Force Participation Rate (%) (Philippines, 1990-2016)



Source of Basic Data: The World Bank 2017.

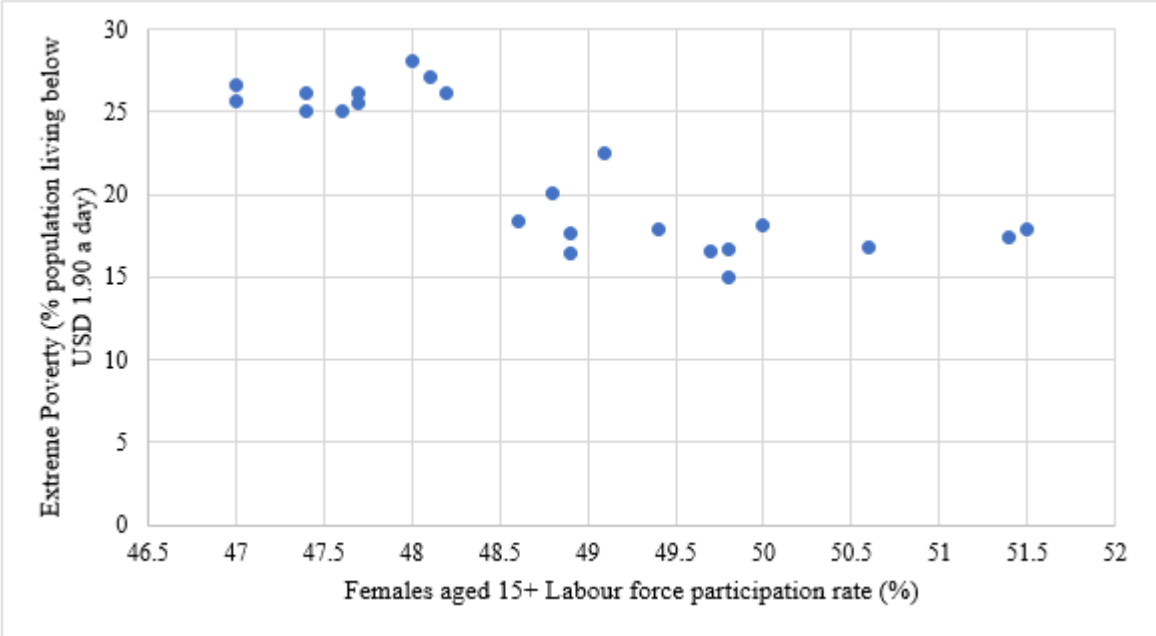
That labour force participation is lower for females may be because another constraint is taking up most of their time. A 1995 study (Zhang and Farley), which surveyed both women from China and the United States (US), found that despite socio-legal changes that allowed women to formally enter the labour force, the prevailing notion in both countries was very similar. Both believed that the responsibility of household work still fell on women (Zhang and Farley 1995). This thinking may persist until the present day. In 2016, the American Time Use Survey by the Bureau of Labour Statistics found that on average, “21 percent of men did housework—such as cleaning or laundry—

compared with 50 percent of women" and for the 2.6 hours a woman spends on household activities daily, a man would spend only 2.0 hours. This shows that even in developed countries such as the US, women still bear the brunt of household work.

It is important that factors attributed to gains in increasing FLFP are maintained. Shown in Figure 2.1.5, as FLFP in the Philippines increased, the proportion of those experiencing extreme poverty in the country decreased (Gapminder, n.d.), as women enter the labour force and acquire income and the financial benefits that come with it.

Figure 2.1.5.

Extreme poverty (%) by FLFP (%) in the Philippines 1991-2007



Source of Basic Data: Gapminder, n.d.

The data show that there are individual and societal benefits to having more women participate in the workforce. Unfortunately, sociological and cultural factors rooted in history, contribute to the perception that women must devote more time to housework than formal labour. As will be explored in the next section, labour-saving technology and home appliances may be important tools to lessen the double burden on women, which expects them to fulfil both greater household and career work.

Theoretical Issues

Becker (1965) notes that in traditional models, households maximize their utility functions U of the form

$$U = U(y_1, y_2, \dots, y_n) \tag{2.2.1}$$

With the constraint

$$\sum p_i' y_i = I = W + V \tag{2.2.2}$$

Where y_i is a market good, p_i' is the price of good i, I is money income. Money Income may be classified as either earnings, W, or other income, V. Becker's point of departure is the incorporation of non-working time which includes leisurely activity, rest, and other non-productive activities. These non-productive activities, however, enter into the utility function of the household. Becker calls these activities commodities, each with inputs, as other goods may be used to

enhance said activity. He gives the example of sleep, which in turn may be affected by taking a sleeping pill. In Becker's theory, these commodities then may be represented as the variable Z_i, with the form

$$Z_i = f_i(x_i, T_i) \tag{2.2.3}$$

Where x_i is a vector of market goods, and T_i is a vector of time inputs used in the production of the i^{th} commodity. It is important to note that time here is a vector because it refers not only to the amount of time, but the type of time. For example, if Z refers to sleep, then sleeping in the evening may have a different effect from sleeping in the middle of the day.

Here, households not only maximize their utilities, but also produce goods (in this case the commodities) to maximize their household utility U. Note that U may now be written in terms of the market goods and time, given by

$$U = U(Z_1, Z_2, \dots, Z_n) \equiv U(x_1, x_2, \dots x_n;\ T_1, T_2, \dots, T_n) \tag{2.2.4}$$

with the constraint

$$g(Z_1, Z_2, \dots, Z_n) = Z \tag{2.2.5}$$

where the function g is the expenditure function of $Z_1$and Z is the total constraint on resources. This new utility function has immediate applications to the topic at hand, as a woman's utility function under Becker's model may take the form of

$$U = U_w(x_1, x_2, \dots x_n;\ T_1, T_2, \dots, T_n) \tag{2.2.6}$$

where some x_i could be a household appliance that reduces the amount of time T_i needed to work on some task, which in turn means that the other T_i can be diverted into labor hours at work to maximize U.

Becker's theory is extended in a paper by Greenwood, Seshadri, and Yorukoglu (2005). In their theory, they define the home goods production function as a Leontief production function or a fixed proportions production function. It is of the form

$$n = \min\{d, \zeta h\} \tag{2.2.7}$$

where d represents the stock of household durables, h is a proxy for the amount of time spent on housework, ζ refers to the labor-augmenting technological progress in household sector.

The authors summarize their theoretical results by first noting that household technology may be defined as a triplet (d, ζ, h). Their analysis makes use of assigning values to different triplets, and is as follows. suppose that $d = \delta, h = \rho\eta$, and $\zeta = \frac{\delta}{\rho\eta}$, where $0 < \rho\eta < 1$ and $\rho > 1$. Now suppose that there exists a new set of household technology, (d', h', ζ') where $d' = \kappa\delta$, $h' = \eta$ and $\zeta = \kappa\frac{\delta}{\eta}$ and $\kappa > 1$. By the earlier definition of non-market goods, the original triplet would produce $n = \min\{d, \zeta h\} = \delta$ units of non-market goods, while the second triplet would produce $n' = \min\{d', \zeta' h'\} = \kappa\delta > \delta$. Thus, the authors have shown using a fixed proportions production function that the original

triplet would require a factor of ρ more to match the new triplet. Hence, should the price of the new technology be low enough, new technology could free up household labor which in turn could mean that married women that once worked full time on household tasks could have time to find employment.

Coen-Pirani, Leon, and Lugauer (2008) extend Greenwood's analysis further. The model begins with the labor supply decision of a married woman whose utility function is described by

$$U = u(c) + g(x) \qquad (2.2.8)$$

where c refers to the consumption of market goods, x refers to home-produced goods, and u and g are strictly increasing and concave functions that are differentiable. Furthermore, the husband earns a wage of y in the market and does no house work. If the woman works, then her wage can be expressed by $w\bar{h}$ where w is her hourly wage and $\bar{h}$ refers to the number of worked, which is determined exogenously. The model by Coen-Pirani, Leon, and Lugauer (2008) has the additional assumptions:

1. Her endowment of time per period is normalized to one, or in other words, the amount of time per period is one.
2. There is no leisure in the model.
3. The home good, x, is produced using the woman's non-market time, which because of assumption 1, is equal to 1 - $\bar{h}$.

The production for the home good is then given by the model

$$x = f\left(1 - \bar{h}I^w, k\right) \tag{2.2.9}$$

where I^w is an indicator random variable which is equal to one if the woman works in the market, and zero otherwise. Additionally, the units of household capital (appliances) is denoted by k, and the household can obtain capital at the rate of q. To maximize the household utility, the proper values of c, k, as well as whether the woman works must be chosen subject to the home production function and the household budget constraint. This may be represented by

$$c = y + w\bar{h}I^w - qk \tag{2.2.9}$$

Using these new values of c and x and maximizing U with respect to k yields the first order condition

$$u'\left(y + w\bar{h}I^w - qk\right) \cdot q = g'\left(f\left(1 - \bar{h}I^w, k\right)\right) \cdot f_k\left(1 - \bar{h}I^w, k\right) \tag{2.2.10}$$

and maximizing this is equivalent to selecting optimal q, y, I^w, and the optimal triple is denoted by $K(q,y, I^w)$. For brevity, let the right hand side of the previous equation be denoted by $F(k, I^w)$. The authors were able to show that a married woman is more likely to participate in the workforce under their theoretical model when the relative price of appliances, q, were to decline so long as the following assumptions hold:

1. $F(k_1, I^w) < F(k_2, I^w)$ whenever $k_2 < k_1$
2. $F(k,1) > F(k,0)$ for all k
3. $k_1 \cdot F(k_1, I^w) < k_2 \cdot F(k_2, I^w)$ whenever $k_1 < k_2$

We note that the right hand side represents the marginal utility from the home goods with respect to an increase in the units of household appliances. Thus, when it is assumed that household appliances increase utility, that choosing to participate in the labor force and earning a wage increases utility holding all others constant, and an increase in household appliances increases utility, then the utility of a woman increases when household appliances increase and she opts to work. Thus, a woman seeking to maximize her utility will purchase household appliances to be able to work.

Methodological Issues

To empirically show whether household appliance ownership (HA) has a positive relationship with married female labour force participation (FLFP), Coen-Pirani, León, and Lugauer (2010, 505) compared FLFP changes in the United States (US) for the years 1960 and 1970. Their model represented married FLFP as a function of the presence of household appliances, individual-level demographic characteristics, and state-level covariates.

$$\mathrm{lfp}_{ist} = \beta\, \mathrm{appl}_{ist} + \mathrm{x}_{ist}\gamma + \mathrm{z}_{\mathrm{ist}}\theta + \delta_{\mathrm{s}} + \delta_{\mathrm{t}} + \epsilon_{\mathrm{ist}} \qquad (2.3.1)$$

Their econometric model is presented in Table 2.3.1 below.

Table 2.3.1.

Coen-Pirani, León, and Lugauer (2010) econometric model for FLFP factors.

Dependent Variable	
$\mathrm{lfp}_{\mathrm{ist}}$, 1=participating, 0 otherwise	Labour force participation for each woman *i* observed in state *s* at time *t*

Independent Variables	
$appl_{ist}$	Presence of household appliances
	Washer present in the household Dryer present in the household Freezer present in the household All 3 appliances present in the household
x_{ist}	Individual-level demographic characteristics
	Education Potential experience Household income Number of children
z_{ist}	State-level covariates
	Share of state's population living in urban areas Years since state's first access of birth control pill Share of state's workforce employed in service sector Average wage income (state) Gender wage gap (state) Ownership rate of TV (state)
δ_s	State of residence effects (dummy)
δ_t	Census year main effects (dummy)

Source of basic data: Coen-Pirani, León, and Lugauer 2010, p. 507

All their data were taken from the Integrated Public Use Microdata Series, 1960 and 1970 US Census of the Population Form 1, which contains data on appliance ownership as well as employment and their sample was "white, US-born," married women with working husbands"(Coen-Pirani, León, and Lugauer 2010, 505). All the variables were binary variables. Presented in Table 2.3.2 are their ordinary least squares (OLS) estimates

Table 2.3.2.

OLS and probit estimates of the effect of HA on married FLFP.

	OLS (1)	OLS (2)	OLS (3)	OLS (4)	OLS (5)	Probit (6)
Washer present in the household	-0.055*** (0.003)			-0.068*** (0.003)		
Dryer present in the household		0.003 (0.003)		0.025*** (0.003)		
Freezer present in the household			-0.005* (0.003)	-0.002 (0.003)		
All 3 appliances present in the household					0.003 (0.002)	0.010 (0.006)

Source of basic data: Coen-Pirani, León, and Lugauer 2010, p. 507

As seen in Table 2.3.2, the researchers found that married FLFP was negatively correlated with owning washers and freezers and positively correlated with owning dryers, while owning all three appliances was had positive but negligible effect on FLFP. It was then hypothesised that HA of single women was a source of bias of endogeneity, since working single women were more likely to purchase appliances (Coen-Pirani, León, and Lugauer 2010). As such, they expressed HA of married women as a function of HA of single women in the model below.

$$\text{appl}_{ist} = \pi\text{appl} - \sin_{st} + x_{ist}\varphi + z_{ist}\psi + \lambda_s + \lambda_t + u_{ist} \qquad (2.3.2)$$

To test this hypothesis, the effects of HA among single women on the HA among married women were estimated using OLS. The results are presented in Table 3.

Table 2.3.3.

Effect estimates of HA among single women on the HA among married women.

	Owns washer (1)	Owns washer (2)	Owns dryer (3)	Owns dryer (4)	Owns freezer (5)	Owns freezer (6)	Owns all three (7)
Share of single women in state owning a washer	0.261*** (0.037)	0.260*** (0.037)		0.237*** (0.075)		-0.119** (0.059)	
Share of single women in state owning a dryer		-0.033 (0.046)	0.433*** (0.084)	-0.350*** (0.062)		-0.062 (0.045)	
Share of single women in state owning a freezer		0.106 (0.064)		0.291*** (0.109)	0.393*** (0.092)	0.374*** (0.102)	
Share of single women in state							1.148*** (0.122)

owning all 3 appliances							
F-statistic	50.27	17.84	26.73	30.98	18.40	15.30	87.98

Source of basic data: Coen-Pirani, León, and Lugauer 2010, p. 508

Coen-Pirani, León, and Lugauer (2010, 508) found that "In all specifications, we find a sizable, positive, and statistically significant relationship" between the HA among single women and that of married women. Because of this, the researchers used two-stage least squares (2LS) estimates, presented in Table 4 below.

Table 2.3.4.

2SLS estimates of the effect of HA on the FLFP of married women.

	2SLS (1)	2SLS (2)	2SLS (3)	2SLS (4)	2SLS (5)	IVProbit (6)
Washer present in the household	-0.027 (0.140)			-0.396 (0.284)		
Dryer present in the household		0.330*** (0.116)		0.353** (0.149)		
Freezer present in the household			0.241** (0.103)	-0.053 (0.217)		
All 3 appliances present in the household					0.274*** (0.068)	0.298*** (0.063)
F-statistic	0.04	8.05	5.49	3.83	16.22	20.85

Source of basic data: Coen-Pirani, León, and Lugauer 2010, p. 508

Using this method, the researchers found a generally positive, significant relationship between HA and married FLFP, particularly for their preferred specification in column 5, as shown in Table 2.3.4. The results show that

ownership of household appliances for married women does increase their labour force participation.

In previous studies for developed countries, it was shown that an increase in ownership of household technology also increased female labour force participation, because women would spend less time doing household chores. A study on the effect of various household durable goods on female labour force participation was undertaken by Omotso and Obembe (2016). The goal of the study was to see whether such would hold true for a developing country such as Nigeria (Omotso and Obembe 2016). The researchers aimed to show that FLFP was a function of socioeconomic determinants (SC) and household appliance ownership (HA), summarised in the following equation:

$$\mathrm{FLFP_i} = \beta_0 + \beta_1 \mathrm{SC_i} + \beta_2 \mathrm{HA} + \mu_i \qquad (2.3.3)$$

The study made use of primary data. A sample of 400 women were asked to answer a standardised survey questionnaire (Omotso and Obembe 2016). The women were asked whether they were currently employed or seeking employment. They were also asked whether they owned household appliances, and if it was the case, were asked to enumerate what these were and how often they were used. Other questions were the age, marital status, years of post-secondary education, and residence area of the respondents. With the exception of age and time spent on household task, the responses were recoded into dummy variables with 1 indicating an affirmative and 0, a negative response (Omotso and

Obembe 2016). These variables were used in the econometric model summarised in Table 1.

Table 2.3.5.

Omotso and Obembe (2016) econometric model for determinants of FLFP.

Dependent variables	
Female Labour Force Participation	1 = women worked/looking for work 0 = otherwise
Independent variables: Ownership of household appliances and socio-economic Variables	
Age	Age of the respondents
Marital status	1 = married 0 = unmarried (Unmarried includes single, divorced and widowed women)
Education	1 = With post-secondary education 0 = otherwise
Residential location	1 = urban 0 = rural
Time spent on household task	Average time spent on domestic activities
Ownership of generator + washing machine	1 = Ownership 0 = otherwise
Ownership of generator with freezer	1 = Ownership 0 = otherwise
Ownership of gas cooker	1 = Ownership, 0 = otherwise

Source of basic data: Omotso and Obembe 2016, p. 80

Non-linear Logit regression model was used because the dependent variable was qualitative (Omotso and Obembe 2016). The results of the regression are summarised below in Table 2.3.6.

Table 2.3.6.

Results of Logit regression for determinants of FLFP.

Variable description	Coefficients (S.E)	Marginal effects
Constant	-5.812 (4.800)	
Age of the female	2.436** (0.961)	0.050 (0.022)
Marital Status, Married = 1, Otherwise 0	-1.044 (0.626)	-0.029 (0.023)
Post-secondary education = 1, Otherwise 0	-1.558** (0.693)	-0.030 (0.015)
Location, Urban = 1, rural = 0	0.739 (0.613)	0.020 (0.021)
Average time spent on domestic activities	-1.792** (0.571)	-0.037 (0.016)
If own Washing machine + Generator = 1, Otherwise 0	1.417** (0.122)	0.021 (0.013)
If own Freezer + Generator = 1, Otherwise 0	0.490 (0.616)	0.010 (0.012)
If own Gas Cooker = 1, Otherwise 0	0.931 (0.569)	0.018 (0.012)
No. of observations	382	
R^2	0.2524	
Fraction of Correct Predictions	0.9789	
**$p < 0.05$		

Source of basic data: Omotso and Obembe 2016, p. 81

Consistent with the literature, the results of the study show that ownership of the various household appliances all have a positive relationship with FLFP. The authors note the significance of owning the washing machine and generator set as instrumental in decreasing the time a woman would spend on housework and instead be able to work (Omotso and Obembe 2016).

For the socioeconomic determinants, the study also found that older and married women were more likely to participate in the labour force. The explanation Omotso and Obembe provided was that these women were more

likely to have financial obligations. Contrary to the literature that was found, women who have had post-secondary education were less likely to participate in the labour force, but the researchers conjectured that the high unemployment rate in the country may have attributed to the unexpected results. Additionally, living in urban areas was positively associated with FLFP, as most economic activities are found in these areas. Finally, consistent with the theories on which study was based, the time spent on domestic activities had a negative relationship with FLFP, as more time spent on housework and childcare would take away from time in the labour market. Such results show that HA may have a similar effect in developing countries as in developed countries, that of increasing FLFP.

While some studies studied the relationship between ownership of household appliances and FLFP, Cavalcanti and Tavares (2008) aimed to find the relationship between the price of household appliances and FLFP. They hypothesised that cheaper appliances would save time on home labour, which is usually delegated to women (Cavalcanti and Tavares 2008). To test this hypothesis, the following model was specified:

$$\mathrm{FLFP}_{it} = \alpha + \beta_0 \cdot \mathrm{PAPPLIANCES}_{it} + \beta_1 \cdot \mathrm{Z}_{it} + \varepsilon_{it} \qquad (2.3.4)$$

The variable of interest, FLFP, was modelled as a function of the relative price of home appliances and a vector of additional determinants including average male income, the growth rate of real gross domestic product (GDP), the share of

government spending from the real GDP, and the share of urban population. The model is summarised in Table 1.

Table Table 2.3.7.

Cavalcanti and Tavares (2008) econometric model for determinants of FLFP.

Dependent Variable	
$FLFP_{it}$	Female labor force participation in country *i* at year *t*
Independent Variables	
$PAPPLIANCES_{it}$	Relative price of home appliances (yearly ratio of home appliance price index to consumer price index)
Z_{it} (vector of additional determinants)	Average male income
	Growth rate (of real GDP)
	Government spending/GDP
	(Share of) Urban population

Source of basic data: Cavalcanti and Tavares 2008, p. 84

The sample for the study consisted of "seventeen OECD countries— including all the largest European economies and the United States— between the years 1975 and 1999" (Cavalcanti and Tavares 2008, 83). All the data, except for the relative price of home appliances, were acquired from the World Bank. As presented in Table 1, FLFP was a binary variable, while PAPPLIANCES was the ratio of the yearly home appliance price index (HPI) by the consumer price index for each country. The data for HPI was from the Statistical Office of the European Union (Cavalcanti and Tavares 2008). OLS was used to estimate the model. Their results are presented in Table 2.3.8.

Table 2.3.8.

Determinants of Female Labor Force Participation— OLS Estimation.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)

Home appliance price index	-39.83** (-4.45)	-36.94** (-16.58)	-5.60** (-3.74)	-4.21** (-2.96)	-3.15** (-2.66)	-3.87** (-2.03)	-3.42** (-2.17)	-7.11** (2.63)	-3.42** (-3.07)	-0.30 (-0.23)
Ave. male income				-0.00007** (-8.11)	-0.00008** (-8.65)	-0.00008** (-7.84)	-0.00009** (-7.81)	-0.0003** (5.33)	-0.00002 (-0.70)	-0.00004 (1.18)
GDP growth rate					0.09** (2.48)	0.07** (2.04)	0.06* (1.72)	0.001 (0.02)	0.02 (1.45)	0.03 (1.22)
Gov spend/GDP						-0.10 (-1.50)	-0.13 (-1.59)	0.07 (0.58)	-0.05 (-0.99)	-0.12** (-2.20)
Urban population							0.02 (1.39)	-0.02 (-0.63)	0.79** (3.44)	0.72** (3.16)
Country dummies	NO	YES	YES	YES	YES	YES	YES	NO	YES	YES
Year dummies	NO	NO	YES	YES	YES	YES	YES	NO	NO	YES
Country time trends	NO	NO	NO	NO	NO	NO	NO	YES	YES	YES
N. of observ.	311	311	311	311	311	311	311	311	311	311
R^2	0.07	0.93	0.98	0.98	0.98	0.98	0.99	0.94	0.99	0.99

Source of basic data: Cavalcanti and Tavares 2008, p. 85

As the researchers hypothesised, the results indicated that PAPPLIANCES had a negative relationship with FLFP for all columns, and was considered a significant determining factor in all regressions except for the last, when dummies for country, year, and country time trend were added. Cavalcanti and Tavares (2008) did note that in column 7, with both country and year dummies, the R-squared was already at 0.99 and did not greatly increase with the addition of country time trends.

The results also showed that FLFP has a positive association with GDP growth, because women may be encouraged to join the labour force when the economy is doing well (Cavalcanti and Tavares 2008). There was a negative association between FLFP and average male income and the researchers concluded that for average male income, the income effect was stronger than substitution effect (Cavalcanti and Tavares 2008). This meant a husband's earning a higher income would mean his wife could have not seen entering in the labour market as a necessity. Consistent with the literature found, FLFP was more likely in urban areas than in rural areas. On the other hand, government spending did not have significant effects in almost all regressions and the researchers opted not to discuss it further (Cavalcanti and Tavares 2008). It was then concluded that the prices of home appliances significantly affect FLFP.

A review of existing research indicated that many studies exploring the relationship of the price of household appliances and female labour force participation have taken place in developed countries or with primary data from surveys. This research aimed to fill the gap of knowledge relating to this topic, particularly in the Philippine context and with more recent secondary data.

CHAPTER III

THEORETICAL FRAMEWORK

This chapter presents the theoretical framework of Coen-Pirani, Leon, and Lugauer (2008) of the effect of the price of household utilities on FLFP. Additionally, the empirical model of Cavalcanti and Taveres (2008) will also be presented, as well as a discussion on data sources.

A. Hypothesis

The hypothesis of the paper is as follows: a decrease of the price index of household durable goods relative to the consumer price index increases female labour force participation.

B. Conceptual framework

The theoretical model to be used is that of Coen-Pirani, Leon, and Lugauer (2008). The first order condition of their model was presented in the previous chapter, given by

$$u'\left(y + w\bar{h}I^{w} - qk\right) \cdot q = g'\left(f\left(1 - \bar{h}I^{w}, k\right)\right) \cdot f_{k}\left(1 - \bar{h}I^{w}, k\right) \qquad (2.2.11)$$

where u represents the utility of a married woman from market goods production, and g that of home-produced goods. Both functions are both strictly increasing, concave, and differentiable. The inputs are y, w, $\bar{h}$, I^{w}, q, k which represent the husband's wage in the market, the woman's hourly wage, number of market hours worked, an indicator function on whether or not the woman decides to work outside the house, the rate of capital accumulation, and units of household capital.

Coen-Pirani, Leon, and Lugauer, using a set of assumptions outlined in section 2.2, were able to show that a decrease in the relative price of appliances, q would lead to an increase in the participation in the workforce. Furthermore, as shown in Table 2.3.2, Coen-Pirani, Leon, and Lugauer were able to empirically prove their hypothesis.

This model was chosen for its explicit definition of the woman's utility function as the sum of the utility from producing market and home goods, which in turn allows traditional techniques in maximizing multivariable functions. This paper focuses on the effect of the price of household goods on the FLFP, and the variables used in the theoretical model make it verifiable using available statistical tools and data sources.

To verify the model, the econometric model to be used is that of by Cavalcanti and Taveres (2008) given by

$$\mathrm{FLFP}_{it} = \alpha + \beta_0 \cdot \mathrm{PAPPLIANCES}_{it} + \beta_1 \cdot \mathrm{Z}_{it} + \varepsilon_{it} \qquad (2.3.4)$$

where FLFP_{it} represents female labour force participation, and was modeled by the prices of household appliances, $\mathrm{PAPPLIANCES}_{it}$ and a vector of additional determinants which include average male income, growth rate of real GDP, government spending as a percentage of GDP, and the share of the urban population.

Cavalcanti and Tavares found that decreases in the price of household goods lead to an increase in female labour force participation, as shown in table 2.3.8. This is consistent with the hypothesized effects.

The model was chosen due to its macroeconomic approach to the problem. Earlier studies relied on surveys for their data, while the paper by Cavalcanti and Taveres used aggregated macroeconomic data. This is not only more convenient from a data gathering standpoint, but allowed for more generalized conclusions to be drawn. Hence, this model is the most appropriate to adapt for this study.

C. Variables and Operationalization

The following table summarizes the variables to be used in the model, as well as any treatment that needs to be done to the data. It must first be noted, that the regression will use quarterly data between the years 1999 to 2015, and hence standardized techniques such as cubic spline interpolation, the process of estimating observations between two data points, will be applied when necessary.

Table 3.1

Operationalization of Variables

Variable	Notes
Female Labour Force Participation	The data for this variable is available, but only for yearly. To account for this, cubic spline was applied to convert yearly data to quarterly.
Prices of household durable goods	This was measured by using the ratio of household commodity price index to the consumer price index. Quarterly data is available for both, however, there is an issue with the benchmark year for CPI being different for some statistical yearbooks. To remedy this, CPI will be recomputed with the benchmark year being 2000.
Average Male Income	This was proxied by quarterly male employment. The rationale being that the original study hypothesized that if males are able to earn, that the role of women in some parts of the world would mean that they would be relegated to household work should the male earn a sufficient wage.
Growth rate of real GDP	This data is available quarterly, hence no conditioning was done to the variable.
Government spending as a percentage of real GDP	These values were obtained by taking the ratio of government spending to real GDP and expressed as percentage points
Urban share of population	The data for this variable, like most population data, is only available for annual observation. This required the cubic spline

	interpolation to be used to generate data between observations.

D. Data Requirements

The data for the study were from various Philippine Statistical Yearbooks and the World Bank data bank, which provides historical data for economic indicators and population statistics of 196 countries. Data on Philippine female labour force participation, female employment, household commodity price index, consumer price index, male employment, male labour force participation, and gross domestic product, and share of government spending from GDP was sourced from the years 1999 to 2015 of the Philippine Statistical Yearbook (PSY). Share of urban population will be sourced from the World Bank for the same years.

Digital copies of the PSY for the years 1999 to 2015 were available on the website of the Philippine Statistics Authority. Each data table was downloadable in both Microsoft Excel spreadsheet and Comma Separated Values format (Philippine Statistics Authority, 2017). Similarly, the data needed from the World Bank were readily available for download in Excel spreadsheets.

The model used by Cavalcanti and Tavares (2008), was estimated using ordinary least squares (OLS). As such, OLS using Gretl statistical software was used in this study.

Given the condition that some of the variables had to be extrapolated from annually to quarterly data, the variable of interest, FLFP, will have two proxies: quarterly FLFP from annual data, and quarterly female employment. Time trends

were also taken into account, as the study made use of time-series data. A summary of the variables used in each of the four regression runs to be done is presented in Table 3.2 below.

Table 3.2.
Summary of OLS Regression Runs

	(1)	(2)	(3)	(4)
Dependent Variable				
Quarterly FLFP (Extrapolated)	Present	Present	Absent	Absent
Quarterly FE	Absent	Absent	Present	Present
Independent Variables				
Quarterly HPI/CPI	Present	Present	Present	Present
Quarterly GDP Growth Rate	Present	Present	Present	Present
Quarterly Gov spending/GDP	Present	Present	Present	Present
Quarterly Urban Pop (Extrapolated)	Present	Present	Present	Present
Quarterly ME (Extrapolated)	Present	Present	Present	Present
Time	Present	Absent	Present	Absent

In the process of model specification, the typical econometric tests were applied. Primarily, Ramsey's RESET for squares was used to check for missing terms and overall specification and a test for heteroscedasticity. Initially, Breusch-Pagan test was used for the testing of heteroscedasticity, because it tests only checks for linear forms of heteroscedasticity. As presented in the following chapter, given the final specification of the model involved quadratic terms, White test was determined the more appropriate test for heteroscedasticity.

CHAPTER IV

ANALYSIS OF RESULTS

This chapter presents the empirical evidence and findings in testing this paper's hypothesis. Descriptive statistics will be presented, along with the results and final model for econometric testing. Included here are justifications for the final specification as well as implications on policy and theoretical appraisal.

A. Descriptive statistics

Table 4.1 shows the list of variables in the econometric model, along with their abbreviations and a brief description. The quarterly data spans from the years 1999 to 2015. As noted in the previous chapter, some handling was required to ensure that all data entries were quarterly. The appendix contains both the raw and the transformed data. For ease of analysis, the variables were assigned shortened names. These are presented in Table 4.1.

Table 4.1

Shortened Variable Names

Abbreviation	Description
FLFP_Rate	The female labour force participation rate.
GS_over_GDP	Government spending as a percentage of real GDP.
HPI_Ratio	The price of household durable goods obtained by dividing household commodity price by the consumer price index.
Urban_Share	The urban share of the total population of the Philippines.

Male_Empl	The number of employed males, measured in thousands.
Growth_rGDP	The growth rate of real GDP.

Table 4.2 contains the mean, median, standard deviation, variance, minimum and maximum values, as well as the average rate of growth of each of the explanatory variables. As shown in Table 4.2, all of the explanatory variables with the exception of HPI_Ratio show, on the average, an increasing trend with time.

Table 4.2

Descriptive statistics of explanatory variables

Variable	Mean	Median	Std. Dev	Min	Max	Average Growth Rates
GS_over_GDP	0.102100482	0.101618	0.006247465	0.092905384	0.12043	0.21%
HPI_Ratio	0.934653654	0.950913	0.065483153	0.844436128	1.031259	-1.33%
Urban_Share	46.03537994	45.96159	1.218666626	44.084262	48.05	0.12%
Male_Empl	20566.23956	20538	2024.670798	16940	24106	0.44%
Growth_rGDP	0.052972774	0.057823	0.016486673	0.008956189	0.079607	1.1%

Furthermore, the Kwiatkowski-Phillips-Schmidl-Shin (KPSS) test was applied to all the variables to test for non-stationarity. The null hypothesis of the test is that the variable is stationary. Included in the test was a test for both time

trends and seasonal dummies to account for seasonal unit roots. The results are summarized in table 4.3 below.

Table 4.3

Results of the KPSS test

Variable	Lag Order	P-Value	Result
FLFP_Rate	3	>.10	Stationary
GS_over_GDP	14	0.053	Stationary
HPI_Ratio	7	0.083	Stationary*
Urban_Share	14	0.053	Stationary
Male_Empl	3	>.10	Stationary
Growth_rGDP	3	>.10	Stationary

The lag orders were increased starting from a base of three and increased until the p-value was larger than 0.05. It should be noted that for both GS_over_GDP and Urban_Share that the lag orders chosen were quite large, reducing the power of the test for these variables. Thus, when interpreting the significance of the variables and their effects, caution must be observed for these variables. However, as shown in the succeeding section, these variables were not found to be significant. Lastly, HPI_Ratio was missing a value and thus the KPSS test could not be directly applied. Thus, a value was interpolated using the previous and succeeding values in the dataset. This interpolated value was not

used in the regression results, but only for the purposes of the KPSS test. Thus, the variables show stationarity and may be used in the model.

B. Regression results

There were a total of 68 observations, however, one was dropped due to incomplete entries in the observation. In addition to the explanatory variables, a square term for HPI_Ratio was applied, as well as a variable corresponding to the time of the observation and dummy variables for each quarter of the year to account for annual and seasonal trends. The final model and regression results are presented in Tables 4.4, 4.5, and 4.6 below

Table 4.4

Regression results

	Coefficient	Std. error	t-ratio	p-value
const	0.691409	0.286749	2.411	0.0191 (**)
GS_over_GDP	0.05261	0.196731	0.2674	0.7901
Urban_Share	0.003353	0.004461	0.7517	0.4553
Male_Empl	3.24E-06	1.85E-06	1.75	0.0854 (*)
Growth_rGDP	0.035883	0.048231	0.744	0.4599
HPI_Ratio	−1.48034	0.543714	−2.723	0.0086 (***)
sq_HPI_Ratio	0.811196	0.27756	2.923	0.005 (***)
Q1	−0.00136310	0.001765	−0.7723	0.4431
Q2	−0.00111468	0.001674	−0.6658	0.5082
Q3	0.000571	0.001701	0.3356	0.7384
Year	−0.00219714	0.00184172	−1.193	0.2379

Table 4.5

Descriptive regression results

Mean dependent var	0.247566	S.D. dependent var	0.005608
Sum squared resid	0.001305	S.E. of regression	0.004785
R-squared	0.371202	Adjusted R-squared	0.271918
F(9, 57)	3.738793	P-value(F)	0.000961
Log-likelihood	268.2802	Akaike criterion	−516.5605
Schwarz criterion	−494.5136	Hannan-Quinn	−507.8365

To ensure that the regression results were valid and that the model was well specified, the model was tested for heteroskedasticity by the White's test and checked for missing square terms using Ramsey's RESET. The following are the results:

Table 4.6

Econometric tests

Test	Null Hypothesis	P-value	Result
White's test for heteroskedasticity	Heteroskedasticity is not present	0.365037	pass
RESET test for specifrication (squares only)	Specification is adequate	0.764548	pass

As shown by Table 4.6, the model does not show any concerns regarding heteroscedasticity and missing quadratic terms.

As indicated by the regression results in Table 4.4, three variables show significance. The main variable of interest of this paper, the relative price of

household durable goods in both linear and quadratic form, show a level of significance to the $\alpha = 0.01$.

The regression results show that a one-unit increase in HPI_ Ratio leads to a 1.66089-unit decrease in FLFP. For the quadratic variable sq_HPI_Ratio, there is an increasing marginal effect. This is because the linear form has a negative coefficient while the quadratic form has a negative coefficient. The effects on FLFP of HPI_Ratio get larger as there are more increases in HPI_ Ratio.

Though male employment is significant, it has not reach an $\alpha = 0.05$ level of significance. As such, a unit increase in male employment leads to only a very slight (3.71567e–006) increase in FLFP.

On the other hand, the share of government spending, share of urban population, and GDP growth rate were found not statistically significant in the regression.

C. Analysis of Results

Consistent with the related literature, the price of household durable goods (HPI_Ratio) was significant, negative relationship with FLFP. This shows that in the Philippines, cheaper household appliances may indeed allow more women to spend less time doing housework (Cavalcanti and Tavares, 2008). As consequence, they are able to participate in the labour force, either employed or seeking employment.

Male employment was a proxy variable for average male income in the econometric model of Cavalcanti and Tavares (2008). In their results, the coefficient for average male income had been negative in all regression runs (Cavalcanti and Tavares, 2008), which shows that higher male income meant a woman would be less likely to work to add to household income. In this case, the proxy variable used was male employment, in the absence of national data on male income. It may be that when male income is not taken into account, male employment alone needs to be supplemented by female employment in order to sufficiently meet household needs. As such, male income may still be the more valid variable when considering the model. Furthermore, male income was theorized in the model to decrease FLFP, while male employment was shown to increase FLFP. Thus, using male income data may significantly alter the effect on FLFP.

That an increase in price of household durable goods is significant in decreasing FLFP is consistent with those of studies conducted in developed countries (Cavalcanti and Tavares, 2008), as well as other developing countries (Omotso and Obembe, 2016). As presented in the literature, it appears that despite these differing contexts, a common theme is that the role of household maintenance is still widely believed to fall on women (Zhang and Farley, 1995). As such, women are able to participate the labour force when household labour and time-saving technology is made more available and accessible to them.

These findings are also consistent with Coen-Pirani, Leon, and Lugauer's (2008) theoretical model, whose model expresses a woman's labour supply as a utility function of the consumption of market goods and home-produced goods.

D. Appraisal of Theoretical Framework

The theoretical framework was able to show that changes in FLFP could be explained by the changes in the prices of household durable goods. Consistent with the framework, there is a negative relationship between the two, such that an increase in the prices of household durable goods causes a decrease in FLFP. The results were able to show though, that there is an increasing marginal effect, when the quadratic form is taken into account. This variable was absent, in the econometric model of Cavalcanti and Tavares (2008) used in the study.

Another limitation of the econometric model was that demographic factors of women were not really taken into account (Cavalcanti and Tavares, 2008). The models by Omotso and Obembe (2016) and Coen-Pirani, Leon, and Lugauer's (2010) both made use of individual women as the sample points. As such, they were able to factor in demographic information about them, such as the woman's age and education, which can indeed factor in the decision to participate in the labour force.

Additionally, the results of the study may have been improved if consistently, the data available in the Philippine Statistical Yearbooks were of quarterly nature. With the variables of interest (e.g. Female employment, HPI, and

CPI) taking quarterly form, it was necessary to transform annual data. Also, male income, which was a significant predictor of FLFP in the Cavalcanti and Tavares (2008) model used in the study, needed to be proxied using male employment, which does not directly translate to higher male income.

Also, labour supply in this model was not a function of a wage variable, though Cavalcanti and Tavares may have used GDP growth in lieu of wage, in order to capture how well the economy was doing and how much in turn employees would be compensated.

Nonetheless, the results show that one important way to address the stagnating gains in FLFP, particularly in developing countries like the Philippines, is through monitoring the commodity prices of household durable goods. Necessarily, the use of household durable goods also requires access to energy and the availability of communications infrastructure, as such, these should be monitored as well. Given the economic and social gains of having more women participate in the workforce, as presented in the second chapter, the results present a key indicator on which greater focus could be given.

CHAPTER V

CONCLUSIONS

This chapter presents the summary of the research paper, its conclusions, and recommendations for further research on the topic of female labour force participation.

A. Summary

The models of both Pirani, Leon, and Lugauers (2010) and Cavalcanti and Tavares (2008) both predict that a decrease in household appliances increases FLFP. The data on the Philippines shows consistency with the theoretical prediction of the model by Pirani, Leon, and Lugauers (2010). The econometric model was adapted from Cavalcanti and Tavares (2008) and slight modifications and generated consistent results with their original study. This implies that the answer to the research question, "Does a decrease in the prices of household goods and appliances increase FLFP in the Philippines?" is in the affirmative.

B. Conclusions

Apart from being able to demonstrate a negative relationship between the prices of household durable goods and FLFP, the regression results also imply positive marginal effects of the prices of household appliances and FLFP. This is a limitation of the literature and previous regression models.

As explained in the policy issues and shown by the data, women are observed to have a lower labour participation rate than men, and a stagnating rate

at that. This paper offers a possible pathway to future policy that aim to increase said rate.

C. Recommendations for further research

There are two clear paths for further research that arise out of this paper. The first is a microeconomic study that aims to answer the same research question, and the second is exploring the possible marginal effects.

The first arises out of the fact that there is a wealth of microeconomic studies in other countries such as the United States and European Union that show similar results. Given that this paper demonstrates that a decrease in the prices of household durable goods increases FLFP, the next step in attempting and policy intervention would be to make a more detailed study on the microscale.

The second research recommendation stems from the lack of current literature on the marginal effects. Despite the abundance of papers on the issue, none of the literature surveyed offered any explanation. It is important to note that government expenditure alone was not a significant factor in increasing FLFP in the related literature and the results of the study. Hence, if specific programs to target FLFP are to be adapted from the study, a deeper understanding of the interplay of the variables must be understood. This is especially true due to the change in sign of the coefficients of the explanatory variables, and hence using the results of this paper to attempt and raise FLFP may not provide straight forward results.

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APPENDICES

A.1. Original Data from Sources

Table A.1.1.

Annual Labour Force in the Philippines (In Thousands) 1991-2015

Year	Labour Force (thousands)
1991	39,114
1992	40,265
1993	41,453
1994	42,670
1995	42,770
1996	45,034
1997	46,214
1998	47,415
1999	48,637
2000	48,076
2001	49,424
2002	50,841
2003	52,305
2004	53,569
2005	54,799
2006	55,988
2007	56,845
2008	57,848
2009	59,237
2010	60,717
2011	61,883
2012	62,985
2013	64,173
2014	64,033

2015	64,936

Source of Basic Data: Philippine Statistical Yearbooks Years 2001-2016

Table A.1.2.

Quarterly Employed Females in the Philippines (In Thousands) 1993-2015

Year	Quarter	Employed Females (in thousands)
1993	Jan	8,753
	Apr	8,991
	Jul	8,977
	Oct	8,975
1994	Jan	8,995
	Apr	9,339
	Jul	9,061
	Oct	9,181
1995	Jan	9,133
	Apr	9,303
	Jul	9,476
	Oct	9,505
1996	Jan	9,794
	Apr	10,180
	Jul	9,956
	Oct	10,134
1997	Jan	10,049
	Apr	10,289
	Jul	10,204
	Oct	10,451

1998	Jan	10,248
	Apr	10,299
	Jul	10,359
	Oct	10,608
1999	Jan	10,596
	Apr	11,093
	Jul	10,981
	Oct	11,079
2000	Jan	10,445
	Apr	9,921
	Jul	10,153
	Oct	10,516
2001	Jan	10,774
	Apr	11,092
	Jul	11,311
	Oct	11,751
2002	Jan	11,530
	Apr	11,771
	Jul	11,912
	Oct	11,811
2003	Jan	11,715
	Apr	11,775
	Jul	11,503
	Oct	12,055
2004	Jan	11,988
	Apr	11,908
	Jul	12,069
	Oct	11,905
2005	Jan	11,877
	Apr	12,521
	Jul	12,545

	Oct	12,670
2006	Jan	12,369
	Apr	12,968
	Jul	13,120
	Oct	12,766
2007	Jan	13,231
	Apr	12,950
	Jul	12,971
	Oct	12,918
2008	Jan	13,038
	Apr	12,762
	Jul	13,461
	Oct	13,257
2009	Jan	13,272
	Apr	13,555
	Jul	14,022
	Oct	13,780
2010	Jan	14,314
	Apr	13,828
	Jul	14,095
	Oct	14,216
2011	Jan	14,100
	Apr	14,436
	Jul	14,631
	Oct	15,308
2012	Jan	14,637
	Apr	14,804
	Jul	14,860
	Oct	14,704
2013	Jan	15,113
	Apr	14,718

	Jul	14,910
	Oct	15,129
2014	Jan	14,374
	Apr	15,333
	Jul	15,210
	Oct	15,315
2015	Jan	15,172
	Apr	15,591
	Jul	15,506
	Oct	15,669

Source of Basic Data: Philippine Statistical Yearbooks Years 2001-2016

Table A.1.3.

Annual Unemployed Females in the Philippines (In Thousands) 1989-2015

Year	Unemployed Females (in thousands)
1989	908
1990	893
1991	977
1992	959
1993	995
1994	955
1995	988
1996	902
1997	966
1998	1,159
1999	1,121
2000	1,156
2001	1,357
2002	1,346
2003	1,384
2004	1,576
2005	1,062
2006	1,031
2007	978
2008	1,002
2009	1,062
2010	1,051
2011	1,041
2012	1,059
2013	1,087

2014	1,000
2015	946

Source of Basic Data: Philippine Statistical Yearbooks Years 2001-2016

Table A.1.4.

Quarterly Employed Males in the Philippines (In Thousands) 1993-2015

Year	Quarter	Employed males (in thousands)
1993	Jan	15,219
	Apr	15,619
	Jul	15,606
	Oct	15,468
1994	Jan	15,678
	Apr	16,223
	Jul	15,664
	Oct	15,985
1995	Jan	16,061
	Apr	16,421
	Jul	16,613
	Oct	16,193
1996	Jan	16,733
	Apr	17,177
	Jul	17,463
	Oct	17,308
1997	Jan	17,286
	Apr	17,815
	Jul	17,327
	Oct	17,437
1998	Jan	17,441
	Apr	17,536
	Jul	17,500
	Oct	17,653
1999	Jan	17,773
	Apr	18,399
	Jul	18,073

	Oct	17,924
2000	Jan	17,287
	Apr	17,289
	Jul	16,940
	Oct	17,258
2001	Jan	17321
	Apr	18068
	Jul	17970
	Oct	18334
2002	Jan	18,175
	Apr	18,415
	Jul	18,192
	Oct	18,440
2003	Jan	18,404
	Apr	18,642
	Jul	18,948
	Oct	19,498
2004	Jan	19,559
	Apr	19,625
	Jul	19,563
	Oct	19,836
2005	Jan	19,757
	Apr	19,700
	Jul	19,977
	Oct	20,205
2006	Jan	20,007
	Apr	20,055
	Jul	20,139
	Oct	20,422
2007	Jan	20,314
	Apr	20,754

	Jul	20,347
	Oct	20,754
2008	Jan	20,654
	Apr	20,774
	Jul	21,132
	Oct	21,276
2009	Jan	20,989
	Apr	21,441
	Jul	21,492
	Oct	21,698
2010	Jan	20,989
	Apr	21,441
	Jul	21,492
	Oct	21,698
2011	Jan	22,193
	Apr	22,383
	Jul	22,475
	Oct	23,241
2012	Jan	22,697
	Apr	23,038
	Jul	22,695
	Oct	22,966
2013	Jan	22,827
	Apr	23,101
	Jul	23,265
	Oct	23,408
2014	Jan	22,045
	Apr	23,331
	Jul	23,242
	Oct	23,522
2015	Jan	23,290

	Apr	23,568
	Jul	23,671
	Oct	24,106

Source of Basic Data: Philippine Statistical Yearbooks Years 2001-2016

Table A.1.5.

Monthly Philippine Consumer Price Index (Base Year 1994) 1999-2003

Year	Month	CPI
1999	January	145.0
	February	145.0
	March	144.6
	April	144.5
	May	144.4
	June	145.7
	July	146.0
	August	146.4
	September	147.2
	October	147.7
	November	147.9
	December	148.1
2000	January	148.7
	February	149.3
	March	149.4
	April	149.6
	May	150.3
	June	151.4
	July	152.1
	August	153.1
	September	153.8
	October	154.9
	November	156.7
	December	157.8
2001	January	159.0
	February	159.3
	March	159.4
	April	159.7
	May	160.1
	June	161.5

	July	162.5
	August	162.8
	September	163.2
	October	163.4
	November	163.8
	December	164.3
2002	January	165.1
	February	164.8
	March	165.2
	April	165.5
	May	165.9
	June	166.3
	July	166.7
	August	167.6
	September	167.9
	October	167.8
	November	167.9
	December	168.6
2003	January	169.2
	February	169.6
	March	169.7
	April	170.0
	May	170.2
	June	171.7
	July	172.0
	August	172.4
	September	172.5
	October	172.7
	November	173.1
	December	173.6

Source of Basic Data: Philippine Statistical Yearbooks Years 2001-2004

Table A.1.6.

Monthly Philippine Consumer Price Index (Base Year 2000) 2003-2010

Year	Month	CPI
2003	January	112.3
	February	112.6
	March	112.5
	April	113.0
	May	113.1
	June	114.2
	July	114.3
	August	114.6
	September	114.7
	October	114.8
	November	115.2
	December	115.5
2004	January	116.5
	February	116.7
	March	117.1
	April	117.7
	May	118.3
	June	120.3
	July	121.8
	August	122.3
	September	123.0
	October	123.5
	November	124.5
	December	125.4
2005	January	126.3
	February	126.6
	March	127.0
	April	127.7
	May	128.3
	June	129.4

	July	130.5
	August	131.1
	September	131.6
	October	132.2
	November	133.3
	December	133.8
2006	January	134.8
	February	136.2
	March	136.7
	April	136.8
	May	137.1
	June	138.1
	July	138.8
	August	139.3
	September	139.1
	October	139.3
	November	139.5
	December	139.6
2007	January	140.0
	February	139.8
	March	139.7
	April	140.0
	May	140.4
	June	141.3
	July	142.4
	August	142.6
	September	142.8
	October	143.1
	November	144.0
	December	145.1
2008	January	146.8
	February	147.3
	March	148.6
	April	151.6

	May	153.8
	June	157.4
	July	159.9
	August	160.3
	September	159.7
	October	159.1
	November	158.2
	December	156.7
2009	January	157.2
	February	158.0
	March	158.1
	April	158.9
	May	158.8
	June	159.7
	July	160.2
	August	160.4
	September	160.7
	October	161.6
	November	162.6
	December	163.5
2010	January	163.9
	February	164.6
	March	165.0
	April	166.0
	May	165.7
	June	166.1
	July	166.4
	August	166.9
	September	166.4
	October	166.1
	November	167.6
	December	168.5

Source of Basic Data: Philippine Statistical Yearbooks Years 2004-2011

Table A.1.7.

Monthly Philippine Consumer Price Index (Base Year 2010) 2010-2015

Year	Month	CPI
2010	January	118.5
	February	119.0
	March	119.3
	April	120.0
	May	119.8
	June	120.2
	July	120.5
	August	121.0
	September	121.0
	October	121.0
	November	122.0
	December	122.5
2011	January	123.2
	February	124.7
	March	125.1
	April	125.6
	May	125.8
	June	126.5
	July	126.5
	August	126.7
	September	126.8
	October	127.3
	November	127.8
	December	127.6
2012	January	128.1
	February	128.1
	March	128.4
	April	129.4
	May	129.6
	June	130.2

	July	130.6
	August	131.5
	September	131.5
	October	131.4
	November	131.4
	December	131.4
2013	January	132.1
	February	132.4
	March	132.5
	April	132.8
	May	133.0
	June	133.7
	July	133.9
	August	134.2
	September	135.0
	October	135.2
	November	135.8
	December	136.8
2014	January	137.7
	February	137.8
	March	137.7
	April	138.3
	May	139.0
	June	139.6
	July	140.4
	August	140.8
	September	140.9
	October	141.0
	November	140.8
	December	140.5
2015	January	141.0
	February	141.2
	March	141.0
	April	141.3

	May	141.2
	June	141.3
	July	141.5
	August	141.7
	September	141.4
	October	141.6
	November	142.3
	December	142.6

Source of Basic Data: Philippine Statistical Yearbooks Years 2011-2016

Table A.1.8.

Monthly Philippine Household Price Index (Base Year 1994) 1999-2003

Year	Month	HPI
1999	January	159.3
	February	160.7
	March	162.4
	April	163.0
	May	163.5
	June	166.2
	July	167.1
	August	167.8
	September	168.2
	October	168.7
	November	169.1
	December	169.6
2000	January	170.7
	February	171.6
	March	172.1
	April	172.9
	May	173.4
	June	173.9
	July	174.2
	August	174.3
	September	175.3
	October	176.6
	November	177.7
	December	178.9
2001	January	180.3
	February	182.5
	March	184.0
	April	184.6
	May	185.0
	June	185.7

	July	186.8
	August	187.2
	September	188.2
	October	188.6
	November	189.7
	December	190.6
2002	January	192.7
	February	193.4
	March	193.8
	April	194.1
	May	194.4
	June	195.0
	July	195.8
	August	196.0
	September	196.6
	October	196.8
	November	197.2
	December	197.5
2003	January	198.3
	February	198.7
	March	199.0
	April	199.3
	May	199.7
	June	200.1
	July	201.6
	August	202.3
	September	202.4
	October	203.0
	November	203.4
	December	203.6

Source of Basic Data: Philippine Statistical Yearbooks Years 2001-2004

Table A.1.9.

Monthly Philippine Household Price Index (Base Year 2000) 2003-August 2011

Year	Month	HPI
2003	January	114.5
	February	114.8
	March	114.9
	April	116.4
	May	116.7
	June	117.0
	July	117.5
	August	118.0
	September	118.2
	October	118.6
	November	118.8
	December	118.9
2004	January	119.3
	February	119.8
	March	120.1
	April	120.5
	May	120.8
	June	121.5
	July	121.7
	August	121.8
	September	122.0
	October	122.6
	November	123.0
	December	123.1
2005	January	124.3
	February	125.2
	March	125.8
	April	126.3

	May	126.6
	June	126.8
	July	127.4
	August	127.7
	September	127.9
	October	128.0
	November	128.1
	December	128.3
2006	January	129.5
	February	130.4
	March	131.5
	April	131.6
	May	131.7
	June	131.9
	July	132.2
	August	132.6
	September	132.6
	October	132.7
	November	132.9
	December	133.0
2007	January	133.2
	February	133.4
	March	133.4
	April	133.5
	May	133.6
	June	133.9
	July	134.2
	August	134.2
	September	134.2
	October	134.3
	November	134.4
	December	134.5
2008	January	136.3
	February	137.1

	March	137.6
	April	138.6
	May	139.0
	June	139.7
	July	140.4
	August	140.9
	September	141.2
	October	141.4
	November	141.5
	December	141.6
2009	January	142.2
	February	142.6
	March	142.9
	April	143.0
	May	143.3
	June	143.6
	July	143.7
	August	144.0
	September	144.1
	October	144.4
	November	144.5
	December	144.6
2010	January	145.0
	February	145.1
	March	145.4
	April	145.5
	May	145.7
	June	145.9
	July	146.2
	August	146.2
	September	146.4
	October	147.0
	November	147.2
	December	147.3

2011	January	147.7
	February	148.1
	March	148.4
	April	148.8
	May	148.8
	June	149.3
	July	149.6
	August	149.6

Source of Basic Data: Philippine Statistical Yearbooks Years 2004-2011

Table A.1.10.

Monthly Philippine Household Price Index (Base Year 2006) 2012-2015

Year	Month	HPI
2012	January	118.0
	February	118.1
	March	118.6
	April	120.0
	May	120.5
	June	121.2
	July	121.9
	August	122.5
	September	122.8
	October	123.1
	November	123.2
	December	123.4
2013	January	123.8
	February	124.0
	March	124.2
	April	124.8
	May	124.9
	June	125.2
	July	125.4
	August	125.5
	September	125.6
	October	125.8
	November	126.0
	December	126.3
2014	January	127.0
	February	127.5
	March	127.7
	April	127.8
	May	128.0
	June	128.4

	July	128.7
	August	128.9
	September	129.1
	October	129.3
	November	129.4
	December	129.6
2015	January	130.0
	February	130.3
	March	130.4
	April	130.7
	May	130.8
	June	130.9
	July	131.0
	August	131.1
	September	131.2
	October	131.3
	November	131.5
	December	131.7

Source of Basic Data: Philippine Statistical Yearbooks Years 2012-2016

Table A.1.11.

Annual Gross Philippine Domestic Product and Government Expenditure

1998-2015*

Year	GDP	GOV
1998	3,326,902	428,566
1999	3,429,434	413,007
2000	3,580,714	409,049
2001	3,684,340	402,495
2002	3,818,667	386,509
2003	4,008,469	400,442
2004	4,276,941	408,469
2005	4,481,279	416,869
2006	4,716,231	461,108

2007	5,028,288	492,947
2008	5,237,101	494,370
2009	5,297,240	548,297
2010	5,701,539	570,208
2011	5,910,201	582,099
2012	6,305,229	672,176
2013	6,750,631	705,811
2014	7,170,414	728,752
2015	7,593,769	785,347

*In Million Pesos at Year-2000 Prices

Source of Basic Data: Philippine Statistical Yearbook 2016

Table A.1.12.

Annual Percent of Philippine Urban Population 1989-2015

Year	Share of Urban Population (%)
1989	47.636
1990	48.59
1991	48.53
1992	48.47
1993	48.41
1994	48.35
1995	48.29
1996	48.23
1997	48.17
1998	48.11
1999	48.05
2000	47.955
2001	47.684
2002	47.414
2003	47.143
2004	46.872
2005	46.603
2006	46.333
2007	46.063
2008	45.793
2009	45.524
2010	45.255
2011	45.017
2012	44.81
2013	44.633
2014	44.488
2015	44.373
2016	44.289

Source of Basic Data: The World Bank, 2017

A.2. Derived Data for use in Regression

Table A.2.1.

Quarterly Female Labour Force Participation (1993-2015)

Year	Quarter	Employed Females (in thousands)	Unemployed females (in thousands)	Employed+Unemployed Females= Female Labour force	Labour force (in thousands)	Female labour force/labour force = FLFP rate
1993	Jan	8,753	995	9,748	41453	0.23515789
	Apr	8,991	987.8885169	9,979	41831	0.238553385
	Jul	8,977	974.0134682	9,951	42201	0.235802953
	Oct	8,975	960.6316853	9,936	42501	0.233775556
1994	Jan	8,995	955	9,950	42670	0.233184907
	Apr	9,339	961.7641365	10,301	42678	0.241362362
	Jul	9,061	975.12539	10,036	42615	0.235505632
	Oct	9,181	986.6739486	10,168	42605	0.238648403
1995	Jan	9,133	988	10,121	42770	0.23663783
	Apr	9,303	973.4924371	10,276	43191	0.237929276
	Jul	9,476	948.7349716	10,425	43789	0.238065098
	Oct	9,505	922.1100204	10,427	44444	0.234613532
1996	Jan	9,794	902	10,696	45034	0.237509437
	Apr	10,180	895.4067402	11,075	45469	0.243581965
	Jul	9,956	903.8097234	10,860	45774	0.237248147
	Oct	10,134	927.3078448	11,061	46004	0.240441411
1997	Jan	10,049	966	11,015	46214	0.238347687
	Apr	10,289	1018.177477	11,307	46450	0.243426876

	Jul	10,204	1074.901135	11,279	46725	0.241386549
	Oct	10,451	1125.424225	11,576	47045	0.24606886
1998	Jan	10,248	1159	11,407	47415	0.240577876
	Apr	10,299	1168.195852	11,467	47826	0.239770123
	Jul	10,359	1158.835737	11,518	48216	0.238878489
	Oct	10,608	1140.057754	11,748	48512	0.242169817
1999	Jan	10,596	1121	11,717	48637	0.240907128
	Apr	11,093	1109.726616	12,203	48551	0.251339153
	Jul	10,981	1110.005917	12,091	48345	0.250097886
	Oct	11,079	1124.532259	12,204	48145	0.253474271
2000	Jan	10,445	1156	11,601	48076	0.241305433
	Apr	9,921	1204.788308	11,126	48229	0.230686784
	Jul	10,153	1262.015596	11,415	48558	0.235079645
	Oct	10,516	1316.485086	11,832	48983	0.241562424
2001	Jan	10,774	1357	12,131	49424	0.245447556
	Apr	11,092	1375.3389	12,467	49818	0.250259328
	Jul	11,311	1375.181699	12,686	50170	0.252864672
	Oct	11,751	1363.183648	13,114	50503	0.25966963
2002	Jan	11,530	1346	12,876	50841	0.253260164
	Apr	11,771	1330.684217	13,102	51200	0.255894031
	Jul	11,912	1325.882609	13,238	51572	0.256687211
	Oct	11,811	1340.639696	13,152	51945	0.25318438
2003	Jan	11,715	1384	13,099	52305	0.250434949
	Apr	11,775	1458.002357	13,233	52642	0.251375201

	Jul	11,503	1536.662866	13,040	52961	0.246213123
	Oct	12,055	1586.991942	13,642	53267	0.256104046
2004	Jan	11,988	1576	13,564	53569	0.253206145
	Apr	11,908	1483.243855	13,391	53872	0.248576543
	Jul	12,069	1338.465927	13,407	54177	0.247474301
	Oct	11,905	1183.955036	13,089	54486	0.240225599
2005	Jan	11,877	1062	12,939	54799	0.236117447
	Apr	12,521	1003.725346	13,525	55115	0.245392185
	Jul	12,545	995.5984242	13,541	55425	0.244305204
	Oct	12,670	1012.92229	13,683	55719	0.24556834
2006	Jan	12,369	1031	13,400	55988	0.239337001
	Apr	12,968	1030.776635	13,999	56224	0.24898062
	Jul	13,120	1015.765376	14,136	56437	0.250467795
	Oct	12,766	995.1214286	13,761	56640	0.242957339
2007	Jan	13,231	978	14,209	56845	0.249960419
	Apr	12,950	971.5899897	13,922	57064	0.24396649
	Jul	12,971	975.2150734	13,946	57301	0.243385221
	Oct	12,918	986.2326203	13,904	57561	0.241555611
2008	Jan	13,038	1002	14,040	57848	0.24270502
	Apr	12,762	1019.910281	13,782	58164	0.236950664
	Jul	13,461	1037.499331	14,498	58504	0.247820367
	Oct	13,257	1052.338715	14,309	58864	0.243092657
2009	Jan	13,272	1062	14,334	59237	0.241977143
	Apr	13,555	1064.84701	14,620	59618	0.245226536
	Jul	14,022	1062.412603	15,084	59997	0.251417926

	Oct	13,780	1057.021894	14,837	60367	0.245781056
2010	Jan	14,314	1051	15,365	60717	0.253059275
	Apr	13,828	1046.264178	14,874	61041	0.243676739
	Jul	14,095	1043.100257	15,138	61341	0.246787827
	Oct	14,216	1041.386207	15,257	61620	0.247605516
2011	Jan	14,100	1041	15,141	61883	0.244673246
	Apr	14,436	1041.955652	15,478	62135	0.249101818
	Jul	14,631	1044.811369	15,676	62392	0.25124755
	Oct	15,308	1050.261401	16,358	62670	0.261023203
2012	Jan	14,637	1059	15,696	62985	0.249200809
	Apr	14,804	1070.881962	15,875	63343	0.250617406
	Jul	14,860	1082.404267	15,942	63698	0.25027986
	Oct	14,704	1089.224438	15,793	63994	0.246792126
2013	Jan	15,113	1087	16,200	64173	0.252441393
	Apr	14,718	1072.938373	15,791	64202	0.245957985
	Jul	14,910	1050.446564	15,960	64135	0.248855262
	Oct	15,129	1024.481472	16,153	64053	0.252189246
2014	Jan	14,374	1000	15,374	64033	0.240094657
	Apr	15,333	980.864544	16,314	64135	0.254366374
	Jul	15,210	966.5594788	16,177	64343	0.25140981
	Oct	15,315	955.4746743	16,270	64622	0.251778988
2015	Jan	15,172	946	16,118	64936	0.248213626
	Apr	15,591	936.5253257	16,528	65250	0.253295607
	Jul	15,506	925.4405212	16,431	65529	0.25075216

	Oct	15,669	911.135456	16,580	65737	0.252220392

Table A.2.2.

Quarterly Share of Government Spending in Millions of Pesos 2000 Prices

(1999-2015)

Year	Quarter	Quarterly GOV	Quarterly GDP	GOV/GDP = Share of GOV
1999	Jan	3429434.298	413007.0432	48637
	Apr	3466140.394	411098.9177	48550.83841
	Jul	3505830.222	410001.4208	48345.09437
	Oct	3545142.079	409417.2493	48145.05314
2000	Jan	3580714.263	409049.1	48076
	Apr	3610215.814	408579.4266	48228.98001
	Jul	3635438.736	407609.7102	48558.07737
	Oct	3659205.773	405721.1886	48983.13604
2001	Jan	3684339.671	402495.1	49424
	Apr	3713095.493	397804.3801	49817.67903
	Jul	3745457.574	392688.7565	50169.84615
	Oct	3780842.57	388479.6547	50503.3402
2002	Jan	3818667.133	386508.5	50841
	Apr	3858750.65	387681.8702	51199.64762
	Jul	3902523.432	391206.9513	51572.03803
	Oct	3951818.524	395866.0818	51944.90942
2003	Jan	4008468.969	400441.6	52305
	Apr	4073239.935	403948.8783	52642.43362
	Jul	4142625.09	406335.4258	52960.87674
	Oct	4212050.226	407781.7853	53267.3815
2004	Jan	4276941.133	408468.5	53569
	Apr	4333998.618	408726.7181	53871.71166
	Jul	4385023.538	409490.0082	54177.205
	Oct	4433091.766	411842.5442	54486.09584
2005	Jan	4481279.173	416868.5	54799
	Apr	4532341.208	425272.6495	55114.73539

	Jul	4587751.619	436242.1666	55424.92827
	Oct	4648663.73	448584.8254	55719.40702
2006	Jan	4716230.864	461108.4	55988
	Apr	4790859.03	472679.7232	56224.36243
	Jul	4869964.976	482401.863	56437.45692
	Oct	4950218.133	489436.9464	56640.07296
2007	Jan	5028287.933	492947.1	56845
	Apr	5100609.093	492709.9046	57063.53365
	Jul	5162677.476	490964.7563	57300.99403
	Oct	5209754.23	490566.5048	57561.2074
2008	Jan	5237100.504	494370	57848
	Apr	5243771.759	504286.3146	58163.62797
	Jul	5244000.711	518451.412	58504.06695
	Oct	5255814.387	534057.4784	58863.72245
2009	Jan	5297239.816	548296.7	59237
	Apr	5379771.833	558904.6918	59617.72009
	Jul	5488776.492	565790.7834	59997.36317
	Oct	5603087.656	569407.7334	60366.82466
2010	Jan	5701539.185	570208.3	60717
	Apr	5769164.554	569079.572	61040.96873
	Jul	5815795.683	568645.9589	61340.54688
	Oct	5857464.106	571966.2006	61619.73459
2011	Jan	5910201.357	582099.0369	61882.532
	Apr	5986175.831	600857.0401	62135.05688
	Jul	6082103.375	625068.1127	62391.89748
	Oct	6190836.698	650313.9897	62669.75965
2012	Jan	6305228.511	672176.406	62985.34925
	Apr	6419290.843	687305.6162	63343.09421
	Jul	6531673.008	696625.9533	63698.31067
	Oct	6642183.643	702130.27	63994.03687
2013	Jan	6750631.383	705811.419	64173.311
	Apr	6856988.117	709452.7344	64201.77171
	Jul	6961878.753	713999.4763	64135.45933
	Oct	7066091.455	720187.3863	64053.01462

2014	Jan	7170414.383	728752.2061	64033.07833
	Apr	7275466.908	740177.3599	64135.30322
	Jul	7381193.225	753937.0022	64343.38999
	Oct	7487368.737	769252.9702	64622.05135
2015	Jan	7593768.846	785347.101	64936
	Apr	7700168.955	801441.2319	65249.94865
	Jul	7806344.467	816757.1998	65528.61001
	Oct	7912070.784	830516.8421	65736.69678

Table A.2.3.

Quarterly Household Appliances Price Ratio in 2000 Prices (1999-2015)

Year	Quarter	Quarterly HPI	Quarterly CPI	C/D = HPI ratio
1999	Jan	93.77916019	97.13902548	0.965411787
	Apr	95.781493	97.13902548	0.98602485
	Jul	97.80326594	98.25659365	0.995386287
	Oct	98.63919129	99.17299955	0.994617403
2000	Jan	100	100	1
	Apr	101.1275272	100.8717032	1.002536133
	Jul	101.8273717	102.5927582	0.992539566
	Oct	103.6547434	104.9173	0.987966174
2001	Jan	106.2986003	106.7724631	0.995561938
	Apr	107.9510109	107.5771122	1.003475634
	Jul	109.2923795	109.1864104	1.000970534
	Oct	110.5948678	109.8569513	1.006717067
2002	Jan	112.7332815	110.6616004	1.018720867
	Apr	113.433126	111.2427358	1.019690186
	Jul	114.3856921	112.2485472	1.019039399
	Oct	114.9883359	112.7179258	1.020142405
2003	Jan	114.7333333	112.4666667	1.02015412
	Apr	116.7	113.4333333	1.028798119
	Jul	117.9	114.5333333	1.029394645
	Oct	118.7666667	115.1666667	1.031259045
2004	Jan	119.7333333	116.7666667	1.025406794
	Apr	120.9333333	118.7666667	1.018243054
	Jul	121.8333333	122.3666667	0.995641515
	Oct	122.9	124.4666667	0.987412962
2005	Jan	125.1	126.6333333	0.98789155
	Apr	126.5666667	128.4666667	0.985210171
	Jul	127.6666667	131.0666667	0.974059003
	Oct	128.1333333	133.1	0.962684698
2006	Jan	130.4666667	135.9	0.960019622

	Apr	131.7333333	137.3333333	0.959223301
	Jul	132.4666667	139.0666667	0.952540748
	Oct	132.8666667	139.4666667	0.952676864
2007	Jan	133.3333333	139.8333333	0.953516091
	Apr	133.6666667	140.5666667	0.950912971
	Jul	134.2	142.6	0.941093969
	Oct	134.4	144.0666667	0.932901435
2008	Jan	137	147.5666667	0.928393946
	Apr	139.1	154.2666667	0.901685393
	Jul	140.8333333	159.9666667	0.880391748
	Oct	141.5	158	0.89556962
2009	Jan	142.5666667	157.7666667	0.903655187
	Apr	143.3	159.1333333	0.900502723
	Jul	143.9333333	160.4333333	0.897153542
	Oct	144.5	162.5666667	0.888866106
2010	Jan	145.1666667	164.5	0.882472138
	Apr	145.7	165.9333333	0.878063479
	Jul	146.2666667	166.5666667	0.878126876
	Oct	147.1666667	167.4	0.87913182
2011	Jan	148.0666667	171.9688901	0.861008445
	Apr	148.9666667	174.2279989	0.855009916
	Jul	149.6	175.1961883	0.853899856
	Oct	(Missing)	176.4410034	
2012	Jan	150.7336553	177.3169843	0.850080188
	Apr	153.7083821	179.4377803	0.856611032
	Jul	156.0456674	181.4663677	0.859915087
	Oct	157.1080699	181.7429933	0.864451867
2013	Jan	158.0854801	183.0339126	0.863695027
	Apr	159.3178669	184.1865191	0.864981149
	Jul	159.9978044	185.8462724	0.860914789
	Oct	160.677742	188.0131726	0.85460896
2014	Jan	162.420082	190.5028027	0.852586312
	Apr	163.2700039	192.2086603	0.849441454
	Jul	164.3324063	194.6060818	0.844436128

	Oct	165.0123439	194.6982904	0.847528469
2015	Jan	166.0322502	195.1132287	0.850953322
	Apr	166.7546838	195.3898543	0.853445971
	Jul	167.1371487	195.7586883	0.853791728
	Oct	167.6471019	196.6346693	0.852581605