# Impact of the 2008-2009 Twin Economic Crises

# on the Philippine Labor Market

*Yana van der Meulen Rodgers, Rutgers University*

*Nidhiya Menon, Brandeis University*

Version: April 27, 2012

Corresponding author: Yana van der Meulen Rodgers, Women's and Gender Studies Department, 162 Ryders Lane, Rutgers University, New Brunswick, NJ 08901, USA. Tel 1-732-932-9331, fax 1-732-932-1335, email yrodgers@rci.rutgers.edu. Contact information for Nidhiya Menon: Department of Economics & IBS, MS 021, Brandeis University, 415 South Street, Waltham, MA 02454-9110, USA. Tel 1-781-736-2230, fax 1-781-736-2269, email nmenon@brandeis.edu.

**Abstract**

This study examines how the 2008-2009 surges in international food and fuel prices and the coinciding global financial crisis impacted the Philippine labor market. Regression estimates using repeated quarterly waves of the Labor Force Survey indicate small declines in employment probabilities, while real wages fell more dramatically: about 6 percent during the price surges and 3 to 4 percent during the financial crisis. Men experienced slightly larger wage declines and women marginally greater employment cuts. Workers across education and age groups experienced wage drops, especially less educated men, women with high school degrees, and older workers.

**Acknowledgements**

# 1. INTRODUCTION

The global financial crisis of 2008-2009 resulted in considerably slower economic growth in the Philippines as elsewhere in East Asia. The financial crisis partially overlapped with lingering effects of a major spike in international food and fuel prices which peaked in mid- to late-2008. Considering the consequences on poverty, a crisis assessment analysis undertaken by the World Bank indicates that poor households were hit harder than rich ones, bearing disproportionate labor market setbacks (ASEAN 2009). Because remittance amounts remained steady, losses in employment and wages served as the main channels through which household incomes declined. With the manufacturing sector bearing the most severe impacts due to declining global demand, employment and wage losses were most evident in this sector and in urban areas. To the extent that mass-produced, low-cost manufactured exports experienced a relatively greater decline in world demand than more capital-intensive exports, women workers, who form the bulk of the labor force involved in the production of less-skilled manufactured products, may have experienced greater negative pressures on employment and wages as compared to male workers. In addition, vulnerable households tried to cope by increasing their indebtedness and by selling their productive assets.

These issues provide strong motivation for further exploration of the impacts of the twin economic crises in the Philippines, with a focus on labor market outcomes such as employment and wages. We conduct this more detailed exploration using micro-level data from quarterly waves of the Philippine Labor Force Survey spanning the 2007-2009 period.[1] Regression estimates indicate that relative to 2007, the likelihood of employment declined by slightly less than 1 percent for both men and women as a result of the food and fuel price hikes and remained at the relatively lower levels during the financial crisis. Most of the declines for men came from

wage-employment during the financial crisis and from self-employment during the food and fuel price crisis. The wage declines are consistent with a slump in global demand for manufacturing products, whereas declines in self-employment possibly reflect increasing input costs as a consequence of fuel price increases. Women lost the largest share of jobs in both wage- and self-employment during the financial crisis. They also saw increases as unpaid family workers during the financial crisis.

Large wage declines proved to be the more extreme repercussion of the twin economic crises. Both men and women experienced large wage declines as a result of the food and fuel price hikes and the global financial crisis. Compared to 2007, men's and women's overall real wages dropped by 6 percent in response to the food and fuel price hikes. Real wages during the financial crisis remained about 4 percent lower for men and 3 percent lower for women relative to 2007, implying that there was some recovery for workers' real wages but levels still remained lower than before the crises. Quantile regression estimates indicate that the real wage decreases were most pronounced at the upper tails of the male and female wage distributions in both crises, relative to 2007. While real wage declines affected the entire economy, they were particularly sharp in the rural sector and for more highly educated men and women. In interpreting the employment and wage estimates together, the results suggest that women suffered relatively more in terms of employment losses whereas men experienced relatively greater declines in real wages during both economic crises.

## 2. CHANGES IN MACROECONOMIC CONDITIONS

Real GDP growth decelerated rapidly after 2007 with the reduction in global demand causing industrial production in the Philippines to slow down in 2008 and 2009, especially in manufacturing industries. In particular, as shown in Panel A of Figure 1, Philippine GDP growth

5

rates fell from a high of 7 percent in 2007 (the highest growth since the mid-1980s) to less than 5 percent as early as the first quarter of 2008, before the full force of the 2008 food and fuel price surges. By the fourth quarter of 2008, real GDP growth had fallen to 1.8 percent. GDP growth rates fell to even lower rates in the first three quarters of 2009 before rising back up to 1.8 percent in the final quarter of 2009, with a striking recovery in 2010.

**Figure 1 Here.**

A similar pattern was observed for exports, which account for almost half of the Philippines' GDP. The Philippines is an exporter of both manufactured products such as electronics and agricultural and fisheries commodities such as coconut oil, fresh bananas, and tuna. The top-ten export products together account for three-quarters of total export revenues, and in 2009, export earnings declined by about a quarter compared to 2008 (NSO 2012b).[2] In particular, Panel B of Figure 1 indicates that the Philippines was affected early on by the recession in the United States. Export growth already fell during the first quarter of 2008, but the real deep contraction in exports started in the fourth quarter of 2008 and worsened in the first quarter of 2009. Export growth did not resume until the final quarter of 2009, with marked recovery in 2010.

Emerging evidence indicates that the large negative shock to external demand served as the main transmission mechanism for the global financial crisis to make its impact in the Philippine economy (Esguerra 2010). A decline in remittances may also have served as a transmission mechanism, since the financial crisis caused contractions in labor markets abroad that employ Philippine overseas contract workers who send money home. Remittances, which amount to as much as 10 percent of GDP, have traditionally served as a household insurance mechanism and as a countercyclical source of funds (Esguerra 2010). However, available

evidence indicates that remittances back to the Philippines did not decline in 2009 (Habib *et al.* 2010; Yap *et al.* 2009).[3] Hence, some of the negative impacts in the Philippines may have been cushioned as a consequence of the remittance flows from abroad.

Coinciding with the beginning of the global financial crisis, a jump in the international price of rice led to a substantial increase in the retail price of rice within the Philippine economy and to acceleration in domestic food inflation. The Philippines is one of world's largest cereal and rice importers, helping to explain why the international price hike made such a large local impact. Furthermore, responding to global pressures, fuel prices also rose steadily in the Philippines with increases peaking at 11 percent - about four times the average inflation rate for 2007. This fuel price hike added to the severity of the impact of the food price increases. As shown in Figure 2, the inflation rate had already jumped to 5.6 percent in the first quarter of 2008, up from an annual average of 2.8 percent in 2007. Inflation soared to above 12 percent in the third quarter of 2008 and remained above 6 percent for the next two quarters. Note that because we do not have the detailed data necessary to separate out the food price hike from the fuel price hike, this study's empirical analysis has grouped these two events together as the "food & fuel crisis".

**Figure 2 Here.**

Evidence in Reyes *et al.* (2010) suggests that the food and fuel price increases served as the main transmission mechanism for this soaring inflation in 2008, which caused households to engage in a number of coping mechanisms. These coping mechanisms included efforts to increase income, reduce consumption (especially of food and clothing), and substitute toward cheaper alternatives. Food price and fuel price shocks most likely had transmission effects on labor market outcomes as well. In particular, the food price shock is likely to have led to an

increase in the wage earnings of agricultural workers since the nominal wage is equal to marginal revenue product in competitive markets. This argument is supported with evidence in Ravallion (1990) for Bangladesh and Ferreira *et al.* (2011) for Brazil, where higher agricultural wages mitigated some of the aggregate poverty impacts from higher food prices. Fuel price shocks, which are transmitted more on the supply side, are likely to have different impacts on the labor market. In particular, higher oil prices contribute directly to higher input and transportation costs, which, in turn, may reduce jobs and wages as employers struggle to curtail production expenses. Higher oil prices also have an indirect effect on raising the price of fertilizer (by more than 300 percent in some countries), which could have the potential to reduce wages in agriculture and also farm-based wage-employment (Robles and Torero 2010).

The repercussions of the food and fuel price hikes and the financial global crisis for overall employment are illustrated in Figure 3. Given the sequence of events as suggested by the changes in GDP, exports, and inflation, one would expect the food and fuel price hikes to have the greatest effects in the second and third quarters of 2008 while the financial crisis would have the strongest impact in the final quarter of 2008 and the first quarter of 2009. Interestingly, employment does not appear to fluctuate substantially in the second and third quarters of 2008 or in the final quarter of 2008 and the first quarter of 2009 as compared to before the crises (2007). Further, note that as expected, overall employment for men generally exceeds employment for women. This preliminary evidence suggests that Philippine employment was not substantially affected by the price hikes and the financial crisis of 2008-2009. The point estimates from the regressions that follow mirror this descriptive finding.

**Figure 3 Here.**

In contrast to the impermeable effects on employment, the second panel of Figure 3 shows that real daily wages underwent significant turmoil during the crises. Men's wages in particular dipped below women's wages during the early half of 2008 and then rebounded somewhat in late 2008 and early 2009. Women's real wages dipped to their lowest level in the third quarter of 2008 and then recovered, staying above men's wages through the remainder of 2009. This figure suggests that real wages fluctuated substantially as a consequence of the twin crises; as seen below, the point estimates from our regressions reflect these trends.

## 3. DATA AND METHODS

The study uses micro-level data from the National Statistics Office's quarterly Labor Force Survey (NSO various years). The data constitute a nationally-representative sample and are used by the Philippine government to construct official labor market indicators. Note that this data source specifically covers market-based work and ignores unpaid domestic work (household chores and childcare). Unpaid domestic work is disproportionately performed by women and often increases in economic crises when households substitute toward relatively cheaper home-produced goods and services (Berik *et al*. 2009). To address this issue, we examine related categories in the Labor Force Survey: women's self-employment and their work as unpaid family helpers.

For the employment and wage regressions, we pooled repeated cross sections of the quarterly releases of the Labor Force Surveys from 2007 to 2009. Our employment sample retains all individuals ages 15 to 65 with observed values for the key regressors, resulting in a total of 749,499 observations for men and 728,339 observations for women. The employment regressions are structured to show the impact on the decision to engage in any type of employment, wage-employment, self-employment, and unpaid family work. The wage sample

draws from the employment sample and keeps all individuals with positive reported daily wages resulting in 197,171 observations for men and 127,602 observations for women. Note that the wage sample is considerably smaller than the overall sample not only because it drops people who are not in the labor force, but it also excludes the self-employed who earn zero wages. Nominal daily wage rates are deflated using regional CPI data published by the Philippines National Statistics Office. Published monthly CPI deflators were averaged to the quarterly level to construct an aggregate deflator which was subsequently used to convert nominal to real values (NSO 2012a).

In the regression analysis for employment, we pooled quarterly data from 2007 to 2009 to create a sample that allows us to examine the likelihood of men and woman engaging in employment, conditional on a vector for the crisis periods as well as a full set of personal and household characteristics. We specified a standard labor supply equation for men and women of the following form:

$$y_{it} = a + bF_t + cX_{it} + \vartheta_{it} \ , \quad \text{--- (1)}$$

where the dependent variable is a dummy for whether the individual is employed. The notation $X_{it}$ is a set of individual and regional characteristics that influence men's and women's decisions to work including age, education, and rural or urban residence. The variable $F_t$ is a set of time dummy variables common to all men and women such that the crisis impact is measured by the coefficient on a particular time dummy (in particular, Quarters 2 and 3 of 2008 for the food & fuel crisis, and Quarter 4 of 2008 and Quarter 1 of 2009 for the financial crisis), relative to 2007. Since the comparison group is 2007 for both crises, any relative differential in the impacts of the crises on employment may be measured by differentiating the appropriate time dummy coefficients. Finally, $\vartheta_{it}$ is the error term. Given the binary nature of the dependent variable, we

employed non-linear models to estimate the standard labor supply model in equation (1). The results tables report marginal effects of probit coefficients and bootstrapped standard errors.[4]

The next part of our analysis entailed estimating the gender wage gap from 2007 to 2009, controlling for variables that may lead to productivity differences between men and women. Using a fairly standard application of the Oaxaca-Blinder procedure, we decomposed the wage gap in each year into a portion explained by average group differences in productivity characteristics and a residual portion that is commonly attributed to discrimination (Oaxaca 1973; Blinder 1973). For a given cross-section in period $t$, the gender wage gap is decomposed by expressing the natural logarithm of real wages *(w)* for male workers *(i=m)* and female workers *(i=f)* as follows:

$$w_{it} = X_{it}\beta_i + \varepsilon_{it} \; . \quad \text{--- (2)}$$

The notation $X$ denotes a set of worker characteristics that affect wages. In $X$, we include the education level attained, age, regional location, and an indicator for rural or urban residence. The notation $\varepsilon$ is a random error term assumed to be normally distributed with variance $\sigma^2$. The gender gap in each period $t$ is described as follows:

$$w_m - w_f = (X_m\beta_m - X_f\beta_f) + (\varepsilon_m - \varepsilon_f) \; . \quad \text{--- (3)}$$

Upon evaluating the regression at the means of the log-wage distribution, the last term becomes zero. Adding and subtracting $X_f\beta_m$ to obtain worker attributes in terms of "male prices" gives

$$w_m - w_f = (X_m - X_f)\,\beta_m + X_f\,(\beta_m - \beta_f) + (\varepsilon_m - \varepsilon_f) \; . \quad \text{--- (4)}$$

The left-hand side of equation (4) is the total log-wage differential. On the right-hand side, the first term is the explained gap (the portion of the gap attributed to gender differences in measured productivity characteristics) and the second term is the residual gap (the portion attributed to gender differences in market returns to those characteristics). The remaining term is

generally ignored as the decomposition is usually conducted at the means; otherwise, the sum of the last two terms is considered the residual gap. The regressions are weighted using sample weights provided in the Labor Force Survey data for the relevant quarters. The male wage regression coefficients are then applied to female worker characteristics to construct measures of the residual wage gap. To estimate the direct impacts of the twin economic crises on wages, we used OLS to estimate separate wage equations for men and women, with equation (2) amended slightly to include the same time dummy variables as in equation 1. This standard approach to wages yields estimates that are performed at the mean of the conditional wage distribution.

In the final part of our analysis, we utilized quantile regression techniques to estimate crisis impacts at different points of the wage distribution. First introduced in Koenker and Bassett (1978) and further discussed in Buchinsky (1994, 1998), the quantile regression model can be considered a location model and written, for each period $t$, as:

$$w_i = X_i\beta_\theta + u_{\theta i}, \quad Quant_\theta(w_i|X_i) = X_i\beta_\theta . \quad \text{--- (5)}$$

The notation $w_i$ denotes the natural logarithm of real wages for the sample of men and women, $X_i$ is the matrix of observed characteristics, $\beta_\theta$ is the vector of quantile regression coefficients, and $u_{\theta i}$ denotes the random error term with an unspecified distribution. The expression $Quant_\theta(w_i|X_i)$ denotes the $\theta th$ conditional quantile of $w_i$ conditional on the matrix of characteristics $X_i$ with $0 < \theta < 1$. Equation (5) assumes that $u_{\theta i}$ satisfies the restriction that $Quant_\theta(u_{\theta i}|X_i) = 0$.

For a given quantile $\theta$, the coefficients $\beta_\theta$ can be estimated by solving the following minimization problem:

$$min_\beta n^{-1} \sum_i \rho_\theta (y_i - X_i\beta_\theta) , \quad \text{-- (6)}$$

where $\rho_\theta(\lambda)$ is a check function defined as $\rho_\theta \lambda = \theta(\lambda)$ for $\lambda \geq 0$ and as $\rho_\theta(\lambda) = (\theta - 1)\lambda$ for $\lambda < 0$. One can trace the entire distribution of log wages conditional on the observed characteristics by steadily increasing $\theta$ from 0 to 1. Given the constraint placed by a finite number of observations, it is practical to estimate a finite number of quantile regressions. Each coefficient in the vector $\beta_\theta$ is then interpreted as the marginal change in the $\theta$th conditional quantile of wages due to a marginal change in the regressor of interest. As before, the standard errors are bootstrapped.

## 4. EMPLOYMENT

Table 1 reports results for the estimated impact of the food and fuel crisis and the financial crisis on men's employment and Table 2 reports results for women's employment. In both tables, the coefficients are interpreted as the change in the marginal probability of employment relative to 2007. That is, each entry shows the coefficient on a dummy variable for the food and fuel crisis (as represented by a dummy variable for Quarters 2 and 3 of 2008) and the financial crisis (as represented by a dummy variable for Quarter 4 of 2008 and Quarter 1 of 2009), with 2007 as the reference period. All regressions include controls for sector, education, and age, where sub-sample regressions exclude the control variables as regressors if those controls are being used to construct the sub-sample. Both tables report significance levels that are calculated from the bootstrapped standard errors of the marginal effects of the probit coefficients.

**Table 1 Here.**

Tables 1 and 2 indicate that the food and fuel crisis had a statistically significant negative impact on both men's and women's overall employment. For men, the probability of employment was about a half percent lower during the food and fuel crisis compared to a year

earlier, and for women it was 1 percent lower. Hence women's overall employment was affected somewhat more negatively than that of men during the food and fuel crisis. The tables further show that the entire drop for men during the food and fuel crisis came from self-employment, while women lost jobs in both wage- and self-employment. Men and women in the urban sector both experienced a larger negative employment effect from the food and fuel crisis compared to their rural sector counterparts. While urban women lost the most in terms of wage-employment during the food and fuel crisis, the drop for rural women comes more from losses in self-employment.

**Table 2 Here.**

Results for the education categories show that during the food and fuel crisis, highly educated men and women experienced the greatest negative impacts on their overall employment probabilities compared to the other groups. None of the other education groups experienced a statistically significant negative employment effect as a result of the food and fuel price hikes. Regarding age differences, the negative impacts of this crisis on overall employment were strongest for men in the prime working age group compared to younger and older men, while younger women experienced a substantially larger decline in their employment probability compared to the older age groups. Finally, in terms of self-employment, declines in the probability of employment for men were dispersed fairly evenly across education groups. In contrast, men with some or completed elementary education actually experienced increases in wage employment while more highly educated women experienced decreases in wage employment. Using education as a proxy for skill, the result suggests that the food and fuel price hikes may have led employers to replace more costly skilled female employees with less costly unskilled male employees.

14

Results in Tables 1 and 2 for the financial crisis indicate that the probability of men's and women's overall employment remained low during the financial crisis relative to 2007. For both men and women, the probability of employment was about 1 percent lower in the financial crisis compared to 2007. These magnitudes are either the same or marginally larger than the food and fuel crisis effects, suggesting that in aggregate, the negative employment effects that occurred during the food and fuel crisis deteriorated further during the financial crisis. Unlike the food and fuel crisis, virtually all the employment decline for men came from falling wage-employment, while women again lost opportunities in both wage- and self-employment. In contrast to the earlier changes, during the financial crisis, women saw a small but statistically significant increase in their employment as unpaid family workers.

During the financial crisis, men in the urban sector experienced a larger negative impact on overall employment compared to the rural sector, while this conclusion is reversed for women. In terms of the different types of employment, compared to urban women, rural women saw a substantially larger negative impact on their self-employment during the financial crisis. As evident, the size of the coefficient for rural women is larger during the financial crisis as compared to the food and fuel crisis, suggesting that the employment cut-backs during the food and fuel crisis for rural-sector self-employment further worsened during the financial crisis. These sector results also show that the increase for women in unpaid family work during the financial crisis comes entirely from the rural sector.

Results for the education groups show that cut-backs in wage-employment probabilities during the financial crisis were dispersed across education groups. One could thus infer that different types of occupations were vulnerable to job cuts during the financial crisis. Interestingly, women's increases in unpaid family work as a response to the financial crisis

occurred almost entirely among the less-educated groups, suggesting that less-skilled women bore the brunt of this burden. Finally, in terms of age, the negative crisis impacts on overall employment were strongest for men below the age of 25 and women below the age of 40.

## 5. WAGES

### (a) Gender wage gap

From 2007 to 2009, the gender wage gap fluctuated to some extent. As shown by the Oaxaca-Blinder decomposition results in Figure 4, the residual wage gap between men and women declined somewhat during the overall period moving from 0.26 to 0.23 log points. However, this change masks substantial quarterly variability. In particular, the gap which was low in early 2008 increased in the second and third quarters of 2008 coinciding with the food and fuel price surges. There was minor improvement thereafter in the final quarter of 2008 and the first quarter of 2009, but the level still remained higher than in early 2008. Since the residual wage gap is commonly used as a proxy for wage discrimination, one can loosely interpret these trends as a sign of potentially rising wage discrimination against women as employers struggled to adjust costs. This result is consistent with a framework in which women who often have relatively weak bargaining power and low workplace status are less able to negotiate for favorable working conditions and higher pay.

**Figure 4 Here.**

### (b) Point estimates

Table 3 reports the results of the twin economic crises on men's and women's real wages. Each entry in the table shows the coefficient from a series of OLS wage regressions on a dummy variable for Quarters 2 and 3 of 2008 (column labeled "food & fuel crisis") or for Quarter 4 of

16

2008 and Quarter 1 of 2009 (column labeled "financial crisis"), with 2007 as the reference time period. The table reports bootstrapped standard errors.

**Table 3 Here.**

Discussing the impacts of the food and fuel crisis first, estimates in Table 3 show that real wages fell for both men and women across sectors, education groups, and age groups. Both men's and women's overall real wages dropped by 6 percent during the food and fuel crisis relative to 2007.[5] The sector results for wages indicate that men and women in the rural sector experienced somewhat larger wage declines compared to their urban counterparts. Among education groups, men with only some elementary school education and women with high school degrees experienced the greatest wage impacts with approximately 7 to 8 percent declines for these groups. While men and women in most other education groups experienced wage cuts of approximately 4 to 6 percent during the food and fuel crisis, workers without any education at all experienced virtually no wage effects, suggesting that the already low wages earned by the least skilled manual laborers did not have much room to drop further. Finally, older men and women saw larger real wage declines as a result of the food and fuel price crisis compared to the younger cohorts. In conjunction with the employment results, these estimates indicate that older workers maintained their jobs at the expense of lower real wages during the food and fuel crisis.

Table 3 further indicates reduced real wages during the financial crisis for both men and women across sectors, education groups, and age groups. Real wages during the financial crisis were about 4 percent lower for men and 3 percent lower for women relative to 2007. These magnitudes are somewhat smaller than those of the food and fuel crisis, indicating a slight recovery in real wages relative to 2007. The sector results for wages show that men and women in the rural sector experienced larger wage declines compared to their urban counterparts.

17

Among education groups, women with high school degrees experienced the greatest wage impact (a decline of 5 percent), whereas the largest impact for men was felt by uneducated men (a decline of 6 percent). Similar to the impacts during the food and fuel crisis, women in the lowest education group had virtually no wage effects during the financial crisis. The results for male wages delineated by education groups suggest that unlike the food and fuel crisis, the financial crisis cut the real wages of men with less education somewhat deeper than men with more education. Finally, older workers had more dramatic real wage cuts during the financial crisis compared to their younger counterparts for both men and women.

Table 4 sheds further light on the wage results by reporting the quantile regression estimates at different points in the wage distribution for men and women. Note that quantile regressions report coefficient estimates that are specific to that particular quantile of the data. So the coefficient estimates reflect impacts from the part of the wage distribution to which the regression is restricted by the quantile specified. For example, the 0.05 decline in male wages during the food and fuel crisis in the first column of Table 4 is relative to other men in the same 10th quantile in 2007. Similarly, the 0.08 decline in male wages during the food and fuel crisis in the 95th quantile of Table 4 is with respect to other men in the same 95th quantile in 2007. This interpretation is unlike Ordinary Least Squares models where the estimates reflect impacts for the average person in the distribution.

**Table 4 Here.**

Overall the estimates provide compelling evidence that the real wage declines relative to 2007 were more pronounced at the upper tails of the male and female wage distributions in both crises. For example, columns 1 and 2 show that men in the 95th percentile of the male wage distribution in the national sample experienced a 8 percent drop in real wages during the food

and fuel crisis and a drop of 7 percent during the financial crisis, compared to a 5 percent drop for men in the 10th percentile during the food and fuel crisis and no significant drop during the financial crisis. This discrepancy between high- and low-earning men in wage impacts occurred in both the urban sector and the rural sector. Comparison by sector between the 10th percentile and 95th percentile male estimates indicates that the differentials were particularly stark for the financial crisis. Moreover, using the same benchmark thresholds, the food and fuel price hikes led to wider dispersion in male real wages in rural as compared to urban settings.

Women also saw greater wage impacts at the upper end of the wage distribution at the all-country level, and the gap was particularly wide during the financial crisis. Interestingly, in urban areas, women at the lower tails experienced losses from the food and fuel crisis that were higher than employed women at the upper tails of the wage distribution. The financial crisis wage impacts in urban areas for women are more in keeping with effects noted for men: that is, workers in the lower tails experience smaller wage declines than workers in the upper tails of the distribution. In rural areas, the differential in women's wage impacts between the 10th percentile and 95th percentile as a result of the food and fuel price increase is more muted. However, the financial crisis appears to have decreased women's wages more in rural areas for women at the upper tails of the distribution, consistent with the findings for men. Finally, the smaller coefficients during the financial crisis as compared to the food and fuel crisis for all workers in most parts of the wage distribution imply that relative to 2007, wage earners experienced moderate real wage increases in late 2008 and early 2009.

### (c) Robustness checks

An issue in these empirical tests is that of selection bias arising from changes in the composition of the labor force or in decisions to engage in certain types of work during the

19

crises. Such changes could bias wages impacts if there were changes in the composition of the labor force or changes in participation in the different types of employment we consider. Since we are not able to address selection bias directly given data constraints, we present a set of tests to provide some evidence that our wage effects are less likely to be contaminated by selection. First, with the addition of the remaining quarters of 2009 and the reformulation of the impact time dummies, the main effect of both crises appears to have been on real wages, not employment. Hence, it is less likely that the wage impacts that we measure arise primarily from changes in the composition of the labor force since the labor force in of itself was only marginally affected.

Second, to provide further evidence that this was indeed the case and to check for selection into different categories of employment (wage labor as opposed to other types of employment) as a consequence of these crises, we undertook two separate tests. We first constructed summary statistics on the average education levels of wage employees, self-employed workers, and unpaid family workers, by gender and by urban/rural. As shown in Table 5, the average composition of the labor force measured by average education levels did not change very much between 2007 and 2009. In particular, education levels are coded as 1 for illiterate, 2 for elementary school education, and 3 for high school education or higher. The table shows that women's and men's average education levels among paid employees, self-employed workers, and unpaid family workers in urban and rural areas range on average between 2 and 3, corresponding to the equivalent of some middle school education. Average education levels are highest among urban women working as paid employees and lowest for rural women working as unpaid family helpers. For every category, average education levels remained virtually the same across the 2007-2009 period, deviating by no more than .02 decimal points. The results in Table

20

5 indicate that any changes in the composition of the labor force were substantively small before and after the twin economic crises.

**Table 5 Here.**

Next, to ensure that there were no systematic differences in participation across different categories of employment, we constructed summary statistics on the proportions of wage employees, self-employed workers, and unpaid workers among all workers, by gender and by urban/rural. These summary statistics, also reported in Table 5, indicate that from 2007 to 2009, participation in wage labor versus other types of employment (self-employment and unpaid family workers) did not substantively change. In particular, the table shows that urban men have the highest employment concentration in wage employment, while rural women have the highest employment concentration in unpaid family work. For every category, the average employment proportion across types of work remained virtually the same from 2007 to 2009 deviating by no more than .01 decimal points. This further indicates that changes in the type of employment in which people engaged would have only minimally impacted effects on wages.

## 6. CONCLUSION

This study has analyzed the transmission effects of the 2008-2009 twin economic crises to the Philippine labor market. The first crisis was the increase in food and fuel prices that affected the Philippine economy in the second and third quarters of 2008; the second was the financial crisis that impacted the economy in the last quarter of 2008 and the first quarter of 2009. A priori, these different types of crises are expected to have different impacts on the labor market. In particular, increases in food prices might increase wages, which are equivalent to marginal revenue product in competitive markets (Ferreira *et al.* 2011).[6] Alternatively, increasing fuel prices might reduce demand by increasing input costs, with subsequent negative

impacts on employment and real wages. The financial crisis would have similar deleterious effects on employment and real wages by reducing global demand and by constraining access to credit. Since these two economic shocks hit the Philippines back-to-back in 2008 and 2009, the country was particularly susceptible to adverse consequences on jobs and wages.

Regression estimates using repeated quarterly waves of the Philippine Labor Force Survey from 2007 to 2009 indicate that both men and women experienced declines of about 1 percent in the likelihood of employment during the crises. Most of the decline for men came from falling self-employment while women lost opportunities in both wage- and self-employment. Reductions in self-employment for men are consistent with higher operation costs associated with higher fuel prices. It is also consistent with the idea that price increases and reduced global demand led to reduced local demand for the small-scale products and services that are produced and sold by relatively more vulnerable workers. Hence, (the relatively small) employment losses from the food and fuel price surges suggest that a transmission mechanism, namely higher input costs for employers, resulted in some production cutbacks. Alternatively, employment losses during the financial crisis are largely explained by the primary transmission mechanism of this crisis: the decline in world demand for electronic products and other manufactured commodities produced in the Philippines.

In contrast to the relatively small employment effects, real wages declined sharply during both the food and fuel price surges and the financial crisis. During the food and fuel crisis, men's and women's overall real wages dropped by 6 percent. Real wages remained depressed during the financial crisis amounting to a 4 percent reduction for men and a 3 percent reduction for women relative to 2007. Furthermore, quantile regression estimates indicate that the real wage decreases were most pronounced at the upper ends of the male and female wage

distributions during both crises. This trend is also apparent for men across rural and urban settings, and the wage differentials are steeper in rural areas of the country. A similar but smaller discrepancy in the impacts of the crises between the upper and lower tails of the wage distribution was found for women. The discrepancy for women was mainly evident in rural areas during the financial crisis.

In addition, explanations for the employment and wage impacts could also hinge on the types of occupations in which skilled and unskilled workers were engaged. In considering education as a proxy for skill, the results suggest that unskilled women workers suffered relatively more in terms of losses in wage employment, whereas unskilled male workers experienced relatively greater declines in their real daily wages. Individuals with less education were likely to be engaged in agriculture or low-skilled manufacturing sector work. Such jobs tend to be on the fringes of the formal sector economy and are the most vulnerable during economic downturns resulting from price increases or a decline in world demand. On the other hand, jobs that required skill were less vulnerable to economic shocks although employers may have adjusted to difficult circumstances by postponing nominal wage increases. In a scenario of rising inflation (as was the case during the twin crises), this story would manifest itself as a fall in real wages for more educated workers in the upper tails of the wage distribution, a prediction that is supported by the quantile regression estimates.

It is interesting to briefly compare our (ex-post) results with those in Habib *et al*. (2010), which conducts an ex-ante analysis of financial crisis impacts for the Philippines based on micro-simulations. Focusing on employment, Habib *et al*. (2010) states that decreased demand for exports would lead to reduced labor demand particularly in manufacturing. Our results support this hypothesis since the financial crisis led to somewhat larger declines in overall employment

as compared to the food and fuel price increase that preceded it, particularly for men. In terms of real wages, Habib *et al*. (2010) indicate that the wage impact of the food and fuel price surge was expected to be larger as compared to the financial crisis. We do find this expectation to be mostly true in our results; however, there are important qualifications in the real wage results by education groups and sector which are absent from the ex-ante results in Habib *et al*. (2010). Habib *et al.* (2010) also do not look at real daily wages alone but classify labor earnings as including wages and salaries as well as the income of self-employed individuals. However, in keeping with our findings, Habib *et al.* (2010) note that tracking wages (alone) is a good benchmark of crisis impacts since in the Philippines, evidence of an economic slowdown will tend to manifest itself first in declining earnings as opposed to reduced employment.

We conclude by briefly discussing the Philippine government's response to the crisis and the policy implications of our results. In terms of response, the government was quick to react to the crisis conditions soon after they appeared. The Department of Labor and Employment initiated a series of measures that were designed to provide help to workers who had been displaced. It implemented a framework for flexible work arrangements that was intended to reduce layoffs at firms that had suffered. These policies included worker rotation, reduced working days and hours, flexible holiday schedules, and forced leaves (Son and San Andres 2009). Other measures included entrepreneurship training, improving access to resources such as pension entitlements, and improvements in mechanisms to correct job and skill mismatches (Soriano 2009). In addition, workers who had lost their livelihoods received job placement referral services, and overseas workers returning from abroad received assistance through programs specific to their previous training (Son and San Andres 2009).

The Department of Labor and Employment also had direct assistance programs for workers with the Comprehensive Livelihood and Emergency Employment Program (CLEEP) being the most prominent. With its nation-wide scope, CLEEP provided affected workers with funding, resources for livelihood, and emergency employment. Reports indicated that through hiring by government organizations, CLEEP was credited with generating over 230,000 jobs in 6 months in 2009 (Son and San Andres 2009). A downside of this emergency program was that employed workers eventually had to search for other jobs when CLEEP ended as there were no plans instituted to subsequently situate workers into other private or public positions.

Although programs such as CLEEP provided a safety-net to workers who were adversely affected, women may have been less able to participate. During periods of economic crisis, women's total hours of work often increase, a phenomenon shown in our results as the probability of unpaid family work increased for women but not for men. Lessons from the 1997-98 East Asian crisis also showed that one of the labor market consequences was an increase in the difference between the hours worked by men and women (Lim 2000). If women are unable to attend remedial programs because of increased work burdens, a solution that might work well is to change the time at which the programs are held in order to facilitate greater attendance.

In this context, programs such as the Women Workers Employment and Entrepreneurship Development (WEED) program could be especially helpful. As described in Manasan (2009), WEED provides entrepreneurship training, skill development, and credit assistance to underemployed and home based women workers as well as women in the informal sector. For women, programs such as WEED can facilitate movement from unpaid work to work that is more remunerative. Instituting programs of this nature will thus benefit a sub-population that may have been hit especially hard by the 2008-2009 twin economic crises.

## References

Association of Southeast Asian Nations (ASEAN) (2009). Social impact of the global economic crisis and social protection responses: Philippines. Mimeo.

Berik, G., Rodgers, Y. & Seguino, S. (2009). Feminist economics of inequality, development, and growth. *Feminist economics, 15* (3), 1-33.

Blinder, A. S. (1973). Wage discrimination: Reduced form and structural estimates. *Journal of human resources, 8* (4), 436-455.

Buchinsky, M. (1994). Changes in the U.S. wage structure 1963-1987: An application of quantile regression. *Econometrica, 62* (2), 405-458.

Buchinsky, M. (1998). Recent advances in quantile regression models: A practical guide for empirical research. *Journal of human resources, 33* (1), 88-126.

Esguerra, J. (2010). Global transmission mechanisms and local policy responses Philippine cases. International Labour Office, Policy Integration Department Working Paper.

Ferreira, F. Fruttero, A., Leite, P., & Lucchetti, L. (2011). Rising food prices and household welfare: Evidence from Brazil in 2008. World Bank Policy Research Working Paper No. 5652.

Habib, B., Narayan, A., Olivieri, S., & Sanchez-Paramo, C. (2010). Assessing poverty and distributional impacts of the global crisis in the Philippines: A microsimulation approach. World Bank Policy Research Working Paper No. 5286.

International Labour Organization (ILO) (Various years). *Labor force statistics database*. Geneva: ILO. Available at http://laborsta.ilo.org.

Koenker, R., & Bassett, G. (1978). Regression quantiles. *Econometrica, 46* (1), 33-50.

Lim, J. (2000). The effects of the East Asian crisis on the employment of women and men: The Philippine case. *World development, 28* (7), 1285-1306.

Manasan, R. (2009). Reforming social protection policy: Responding to the global financial crisis and beyond. Philippine Institute for Development Studies (PIDS), Discussion Paper No. 2009-22, Makati City, Philippines: PIDS.

National Statistics Office, Republic of the Philippines (NSO) (2012a). *Index of price/inflation statistics.* Manila: NSO. http://www.census.gov.ph/data/sectordata/datacpi.html.

National Statistics Office, Republic of the Philippines (NSO) (2012b). *Index of foreign trade statistics.* Manila: NSO. http://www.census.gov.ph/data/sectordata/datafts.html.

National Statistics Office, Republic of the Philippines (NSO) (2012c). *National quickstat: A monthly update of Philippine statistics.* Manila: NSO.

http://www.census.gov.ph/data/quickstat/altindex.html.

National Statistics Office, Republic of the Philippines (NSO) (Various years). *Labor force survey.* Database. Manila: NSO.

Oaxaca, R. (1973). Male-female differentials in urban labor markets. *International economic review, 14* (3), 693-709.

Ravallion, M. (1990). Rural welfare effects of food price changes under induced wage responses: Theory and evidence for Bangladesh. *Oxford economic papers, 42* (3), 574-585.

Reyes, C., Sobreviñas, A., & de Jesus, J. (2010). The impact of the global financial crisis on poverty in the Philippines. Philippine Institute for Development Studies Discussion Paper Series No. 2010-04.

Robles, M., & Torero, M. (2010).  Understanding the impact of high food prices in Latin America. *Economía, 10* (2), 117-159.

Son, H.H., & San Andres, E. A. (2009).  How has Asia fared in the global crisis? A tale of three countries: Republic of Korea, Philippines, and Thailand. ADB Economics Working Paper Series No. 174.

Soriano, M.T. (2009).  Department of labor and employment's response to the impact of the financial crisis. *Asia-Pacific social science review, 9* (1), 47-50.

Yap, J. T., Reyes, C. M., & Cuenca, J. S. (2009).  Impact of the global financial and economic crisis on the Philippines. Philippine Institute for Development Studies (PIDS), Discussion Paper No. 2009-30, Makati City, Philippines: PIDS.

**Endnotes**

[1] Note that the results describe empirical associations rather than causal relationships. To argue that labor market effects were actually caused by the twin economic crises, one of the things we would need is a robust measure of how the Philippine economy would have evolved in the absence of the crisis (Son and San Andres 2009).

[2] Moreover, imports, mainly of electronic components and semi-conductors used in export products, also experienced steep declines in 2009. The Philippines spent about 28 percent less on its top-ten imported items in 2009 compared to 2008 (NSO 2012b).

[3] Overseas contract workers account for about 28 percent of the Philippine labor force and send remittances to approximately one fourth of all households (Habib *et al.* 2010).

[4] As a robustness check, we estimated multinomial logit and multinomial probit models that allow several categories of employment to be compared to the excluded category of no employment, simultaneously. A comparison of the coefficients that we obtained from the polytomous choice models and corresponding probit/logit regressions showed that the magnitudes of the coefficients remained the same. We estimate marginal probit models since bootstrapping standard errors for marginal probits is relatively straightforward to implement.

[5] Note that some of the real wage effects may reflect trend declines, as real wages declined fairly steadily during the 2001-08 period (ILO various years). To disentangle how much of the real wage decline is due to the crises and how much is due to trend, we would need to include annual trends in the regressions. We are unable to do this given insufficient data.

[6] We do see some evidence for this in the case of the Philippines as well. However, since the focus on this paper is real wages, these nominal wage graphs are not included in the paper but are available on request.

**Table 1.** Marginal Effects of the Food and Fuel Price Hikes and the Financial Crisis on Male Employment

| | All Employment | | Wage Employment | | Self-Employment | | Family Workers | |
|---|---|---|---|---|---|---|---|---|
| | *Food & Fuel Crisis* | *Financial Crisis* | *Food & Fuel Crisis* | *Financial Crisis* | *Food & Fuel Crisis* | *Financial Crisis* | *Food & Fuel Crisis* | *Financial Crisis* |
| *All country* | -0.004** | -0.006*** | 0.007*** | -0.007*** | -0.012*** | -0.001 | 0.001 | 0.0005 |
| | (0.002) | (0.002) | (0.002) | (0.002) | (0.001) | (0.001) | (0.001) | (0.001) |
| *Sector* | | | | | | | | |
| Urban | -0.007** | -0.007*** | 0.002 | -0.005* | -0.010*** | -0.002 | 0.002** | -0.0002 |
| | (0.003) | (0.003) | (0.003) | (0.003) | (0.002) | (0.002) | (0.001) | (0.001) |
| Rural | -0.001 | -0.005** | 0.012*** | -0.008*** | -0.014*** | 0.001 | -0.0003 | 0.001 |
| | (0.002) | (0.002) | (0.002) | (0.003) | (0.002) | (0.002) | (0.001) | (0.001) |
| *Education* | | | | | | | | |
| None | -0.003 | 0.004 | 0.006 | -0.012 | -0.019 | 0.012 | 0.004 | 0.002 |
| | (0.011) | (0.011) | (0.012) | (0.011) | (0.015) | (0.015) | (0.006) | (0.005) |
| Some elementary | 0.003 | 0.003 | 0.017*** | -0.008* | -0.012*** | 0.009** | -0.001 | 0.001 |
| | (0.003) | (0.003) | (0.005) | (0.004) | (0.005) | (0.004) | (0.002) | (0.002) |
| Completed elementary | 0.001 | 0.006** | 0.018*** | 0.002 | -0.017*** | 0.004 | -0.0004 | -0.0003 |
| | (0.003) | (0.003) | (0.005) | (0.005) | (0.005) | (0.005) | (0.002) | (0.002) |
| Some high school | 0.001 | -0.022*** | 0.004 | -0.009** | -0.008*** | -0.008*** | 0.004** | -0.002 |
| | (0.005) | (0.005) | (0.004) | (0.004) | (0.003) | (0.002) | (0.002) | (0.002) |
| Completed high school | -0.007** | 0.004 | 0.004 | -0.003 | -0.011*** | 0.0004 | 0.001 | 0.004*** |
| | (0.003) | (0.003) | (0.004) | (0.004) | (0.003) | (0.003) | (0.001) | (0.001) |
| College and above | -0.011*** | -0.016*** | 0.0003 | -0.010*** | -0.011*** | -0.002 | 0.001 | -0.002** |
| | (0.004) | (0.004) | (0.004) | (0.003) | (0.002) | (0.002) | (0.001) | (0.001) |
| *Age* | | | | | | | | |
| 15-24 | -0.003 | -0.009*** | 0.004 | -0.004 | -0.006*** | -0.005*** | 0.0003 | -0.0004 |
| | (0.003) | (0.003) | (0.003) | (0.003) | (0.001) | (0.001) | (0.002) | (0.002) |
| 25-39 | -0.004* | -0.005** | 0.011*** | -0.007** | -0.018*** | -0.002 | 0.002* | 0.002* |
| | (0.002) | (0.002) | (0.003) | (0.003) | (0.003) | (0.002) | (0.001) | (0.001) |
| 40-65 | -0.003 | 0.001 | 0.005* | -0.007** | -0.010*** | 0.008*** | 0.001 | -0.0004 |
| | (0.002) | (0.002) | (0.003) | (0.003) | (0.003) | (0.003) | (0.001) | (0.001) |

**Note:** Weighted to national level with weights provided by the NSO in every quarter. Bootstrapped standard errors (shown in parentheses) and significance levels are calculated from the marginal effects of a series of probit regressions. The notation *** is $p<0.01$, ** is $p<0.05$, * is $p<0.10$. Each entry shows the marginal probability for the respective time-period relative to 2007. Regressions include controls for sector, education, and age. Observations for "all country" male employment are 749,499.

**Source:** Authors' calculations based on NSO (various years).

**Table 2.** Marginal Effects of the Food and Fuel Price Hikes and the Financial Crisis on Male Employment

| | All Employment | | Wage Employment | | Self-Employment | | Family Workers | |
|---|---|---|---|---|---|---|---|---|
| | *Food & Fuel Crisis* | *Financial Crisis* | *Food & Fuel Crisis* | *Financial Crisis* | *Food & Fuel Crisis* | *Financial Crisis* | *Food & Fuel Crisis* | *Financial Crisis* |
| *All country* | -0.009*** | -0.009*** | -0.004** | -0.006*** | -0.003*** | -0.006*** | -0.001 | 0.002*** |
| | (0.002) | (0.002) | (0.002) | (0.002) | (0.001) | (0.001) | (0.001) | (0.001) |
| *Sector* | | | | | | | | |
| Urban | -0.010*** | -0.008*** | -0.007*** | -0.005** | -0.003** | -0.003** | 0.001 | -0.0002 |
| | (0.003) | (0.003) | (0.002) | (0.002) | (0.001) | (0.001) | (0.001) | (0.001) |
| Rural | -0.008*** | -0.011*** | -0.0005 | -0.006*** | -0.004** | -0.010*** | -0.004*** | 0.005*** |
| | (0.002) | (0.003) | (0.002) | (0.002) | (0.002) | (0.001) | (0.001) | (0.002) |
| *Education* | | | | | | | | |
| None | -0.015 | 0.002 | -0.004 | -0.011** | -0.009 | -0.014* | 0.0001 | 0.033*** |
| | (0.014) | (0.013) | (0.005) | (0.005) | (0.008) | (0.008) | (0.010) | (0.010) |
| Some elementary | -0.010 | 0.007 | 0.004 | -0.005 | -0.007* | -0.012*** | -0.006* | 0.024*** |
| | (0.006) | (0.006) | (0.004) | (0.004) | (0.004) | (0.004) | (0.003) | (0.004) |
| Completed elementary | -0.003 | 0.001 | 0.003 | -0.004 | -0.007* | -0.007* | 0.0005 | 0.011*** |
| | (0.005) | (0.005) | (0.004) | (0.004) | (0.004) | (0.004) | (0.003) | (0.003) |
| Some high school | -0.005 | -0.023*** | 0.001 | -0.007*** | -0.003 | -0.006*** | -0.002 | -0.005** |
| | (0.004) | (0.004) | (0.003) | (0.003) | (0.002) | (0.002) | (0.002) | (0.002) |
| Completed high school | -0.015*** | -0.011*** | -0.011*** | -0.007** | -0.002 | -0.005*** | -0.002 | 0.001 |
| | (0.004) | (0.004) | (0.003) | (0.003) | (0.002) | (0.002) | (0.002) | (0.002) |
| College and above | -0.008*** | -0.008** | -0.006* | -0.001 | -0.002 | -0.003** | -0.0001 | -0.002* |
| | (0.003) | (0.004) | (0.003) | (0.004) | (0.002) | (0.001) | (0.001) | (0.001) |
| *Age* | | | | | | | | |
| 15-24 | -0.016*** | -0.010*** | -0.014*** | -0.004 | -0.001* | -0.001 | -0.0002 | -0.004*** |
| | (0.003) | (0.003) | (0.002) | (0.003) | (0.001) | (0.001) | (0.001) | (0.001) |
| 25-39 | -0.007** | -0.011*** | 0.0005 | -0.003 | -0.005** | -0.010*** | -0.003* | 0.002* |
| | (0.003) | (0.003) | (0.003) | (0.003) | (0.002) | (0.002) | (0.001) | (0.001) |
| 40-65 | -0.003 | -0.004 | 0.002 | -0.008*** | -0.004* | -0.007*** | -0.001 | 0.010*** |
| | (0.003) | (0.003) | (0.003) | (0.003) | (0.002) | (0.002) | (0.002) | (0.002) |

**Note:** Weighted to national level with weights provided by the NSO in every quarter. Bootstrapped standard errors (shown in parentheses) and significance levels are calculated from the marginal effects of a series of probit regressions. The notation *** is $p<0.01$, ** is $p<0.05$, * is $p<0.10$. Each entry shows the marginal probability for the respective time-period relative to 2007. Regressions include controls for sector, education, and age. Observations for "all country" female employment are 728,339.
**Source:** Authors' calculations based on NSO (various years).

**Table 3.** OLS Regression Estimates of the Food and Fuel Price Hikes and the Financial Crisis Impacts on Real Daily Wages

| | Male Wages | | Female Wages | |
|---|---|---|---|---|
| | *Food & Fuel Crisis* | *Financial Crisis* | *Food & Fuel Crisis* | *Financial Crisis* |
| *All country* | -0.059*** | -0.035*** | -0.056*** | -0.029*** |
| | (0.003) | (0.003) | (0.005) | (0.004) |
| *Sector* | | | | |
| Urban | -0.056*** | -0.032*** | -0.051*** | -0.025*** |
| | (0.004) | (0.004) | (0.006) | (0.006) |
| Rural | -0.062*** | -0.039*** | -0.064*** | -0.036*** |
| | (0.004) | (0.005) | (0.007) | (0.007) |
| *Education* | | | | |
| None | -0.032 | -0.063* | -0.016 | -0.034 |
| | (0.030) | (0.035) | (0.059) | (0.050) |
| Some elementary | -0.070*** | -0.039*** | -0.052*** | -0.033** |
| | (0.008) | (0.009) | (0.013) | (0.014) |
| Completed elementary | -0.063*** | -0.042*** | -0.051*** | -0.030** |
| | (0.007) | (0.008) | (0.013) | (0.013) |
| Some high school | -0.058*** | -0.029*** | -0.039*** | -0.022 |
| | (0.008) | (0.008) | (0.015) | (0.014) |
| Completed high school | -0.068*** | -0.041*** | -0.083*** | -0.054*** |
| | (0.006) | (0.005) | (0.009) | (0.009) |
| College and above | -0.043*** | -0.026*** | -0.043*** | -0.015** |
| | (0.007) | (0.007) | (0.007) | (0.007) |
| *Age* | | | | |
| 15-24 | -0.056*** | -0.029*** | -0.053*** | -0.030*** |
| | (0.006) | (0.007) | (0.008) | (0.009) |
| 25-39 | -0.055*** | -0.034*** | -0.048*** | -0.024*** |
| | (0.004) | (0.004) | (0.007) | (0.008) |
| 40-65 | -0.066*** | -0.041*** | -0.064*** | -0.035*** |
| | (0.006) | (0.005) | (0.007) | (0.008) |

**Note:** Weighted to national level with weights provided by the NSO in every quarter. Standard errors, in parentheses, are bootstrapped. The notation *** is p<0.01, ** is p<0.05, * is p<0.10. Each entry shows the wage effect for the respective time-period relative to 2007. Regressions include controls for sector, education, and age. Observations total 238,773 for male wages and 154,691 for female wages.
**Source:** Authors' calculations based on NSO (various years).

**Table 4**. Quantile Regression Estimates of the Food and Fuel Price Hikes and the Financial Crisis Impacts on Real Daily Wages

| Wage Percentile | Total | | Urban | | Rural | |
|---|---|---|---|---|---|---|
| | *Food & Fuel Crisis* | *Financial Crisis* | *Food & Fuel Crisis* | *Financial Crisis* | *Food & Fuel Crisis* | *Financial Crisis* |
| *Male* | | | | | | |
| 10 | -0.051*** | -0.008 | -0.056*** | -0.005 | -0.041*** | -0.006 |
| | (0.005) | (0.006) | (0.007) | (0.009) | (0.008) | (0.008) |
| 30 | -0.048*** | -0.018*** | -0.037*** | -0.009*** | -0.057*** | -0.020*** |
| | (0.003) | (0.003) | (0.005) | (0.003) | (0.006) | (0.006) |
| 50 | -0.060*** | -0.038*** | -0.051*** | -0.028*** | -0.066*** | -0.046*** |
| | (0.003) | (0.003) | (0.005) | (0.004) | (0.005) | (0.006) |
| 70 | -0.060*** | -0.038*** | -0.054*** | -0.031*** | -0.067*** | -0.047*** |
| | (0.003) | (0.004) | (0.002) | (0.004) | (0.006) | (0.005) |
| 90 | -0.068*** | -0.057*** | -0.067*** | -0.054*** | -0.080*** | -0.070*** |
| | (0.004) | (0.004) | (0.004) | (0.006) | (0.005) | (0.005) |
| 95 | -0.076*** | -0.072*** | -0.069*** | -0.074*** | -0.080*** | -0.074*** |
| | (0.008) | (0.006) | (0.007) | (0.010) | (0.007) | (0.008) |
| *Female* | | | | | | |
| 10 | -0.045*** | 0.003 | -0.054*** | -0.010 | -0.062*** | 0.004 |
| | (0.012) | (0.007) | (0.008) | (0.012) | (0.014) | (0.013) |
| 30 | -0.050*** | -0.019*** | -0.047*** | -0.002 | -0.067*** | -0.056*** |
| | (0.004) | (0.005) | (0.004) | (0.004) | (0.008) | (0.008) |
| 50 | -0.060*** | -0.034*** | -0.051*** | -0.027*** | -0.067*** | -0.045*** |
| | (0.006) | (0.007) | (0.007) | (0.007) | (0.009) | (0.008) |
| 70 | -0.056*** | -0.038*** | -0.052*** | -0.033*** | -0.059*** | -0.039*** |
| | (0.005) | (0.006) | (0.007) | (0.007) | (0.007) | (0.006) |
| 90 | -0.062*** | -0.049*** | -0.053*** | -0.043*** | -0.068*** | -0.053*** |
| | (0.005) | (0.005) | (0.008) | (0.007) | (0.007) | (0.009) |
| 95 | -0.049*** | -0.038*** | -0.039*** | -0.032*** | -0.061*** | -0.045*** |
| | (0.009) | (0.008) | (0.009) | (0.008) | (0.013) | (0.010) |

**Note:** Standard errors, in parentheses, are bootstrapped. The notation *** is $p<0.01$, ** is $p<0.05$, * is $p<0.10$. Each entry shows the marginal wage effect for the respective time-period relative to 2007. Regressions include controls for sector, education, and age. Observations are 238,773 for total men, 154,691 for total women, 132,181 for urban men, 106,592 for rural men, 96,082 for urban women, and 58,609 for rural women.
**Source:** Authors' calculations based on NSO (various years).

**Table 5.** Changes in the Composition of the Labor Force, 2007-2009

| | *2007* | *2008* | *2009* |
|---|---|---|---|
| **Women's Average Education** | | | |
| Paid Employees | | | |
|   Urban | 2.87 | 2.88 | 2.88 |
|   Rural | 2.70 | 2.71 | 2.72 |
| Self-Employed | | | |
|   Urban | 2.74 | 2.75 | 2.76 |
|   Rural | 2.49 | 2.50 | 2.52 |
| Unpaid Family Workers | | | |
|   Urban | 2.76 | 2.75 | 2.75 |
|   Rural | 2.40 | 2.40 | 2.40 |
| **Men's Average Education** | | | |
| Paid Employees | | | |
|   Urban | 2.81 | 2.82 | 2.82 |
|   Rural | 2.56 | 2.57 | 2.58 |
| Self-Employed | | | |
|   Urban | 2.69 | 2.69 | 2.70 |
|   Rural | 2.38 | 2.38 | 2.39 |
| Unpaid Family Workers | | | |
|   Urban | 2.74 | 2.75 | 2.76 |
|   Rural | 2.53 | 2.55 | 2.55 |
| **Women's Employment Shares** | | | |
| Urban | | | |
|   Wage -Workers | 0.67 | 0.67 | 0.67 |
|   Self-Employed | 0.25 | 0.25 | 0.24 |
|   Unpaid Family Workers | 0.08 | 0.08 | 0.08 |
| Rural | | | |
|   Wage -Workers | 0.42 | 0.42 | 0.43 |
|   Self-Employed | 0.32 | 0.31 | 0.30 |
|   Unpaid Family Workers | 0.26 | 0.27 | 0.27 |
| **Men's Employment Shares** | | | |
| Urban | | | |
|   Wage -Workers | 0.72 | 0.72 | 0.73 |
|   Self-Employed | 0.24 | 0.23 | 0.23 |
|   Unpaid Family Workers | 0.04 | 0.04 | 0.04 |
| Rural | | | |
|   Wage -Workers | 0.48 | 0.48 | 0.49 |
|   Self-Employed | 0.39 | 0.38 | 0.38 |
|   Unpaid Family Workers | 0.13 | 0.13 | 0.13 |

**Note:** Education levels are coded as 1=illiterate, 2=elementary school education, and 3=high school education or more. The employment shares sum to 1 for each rural and urban grouping.

**Figure 1.** GDP and Export Growth Rates (Year-on-Year) for the Philippines, 2006-2010

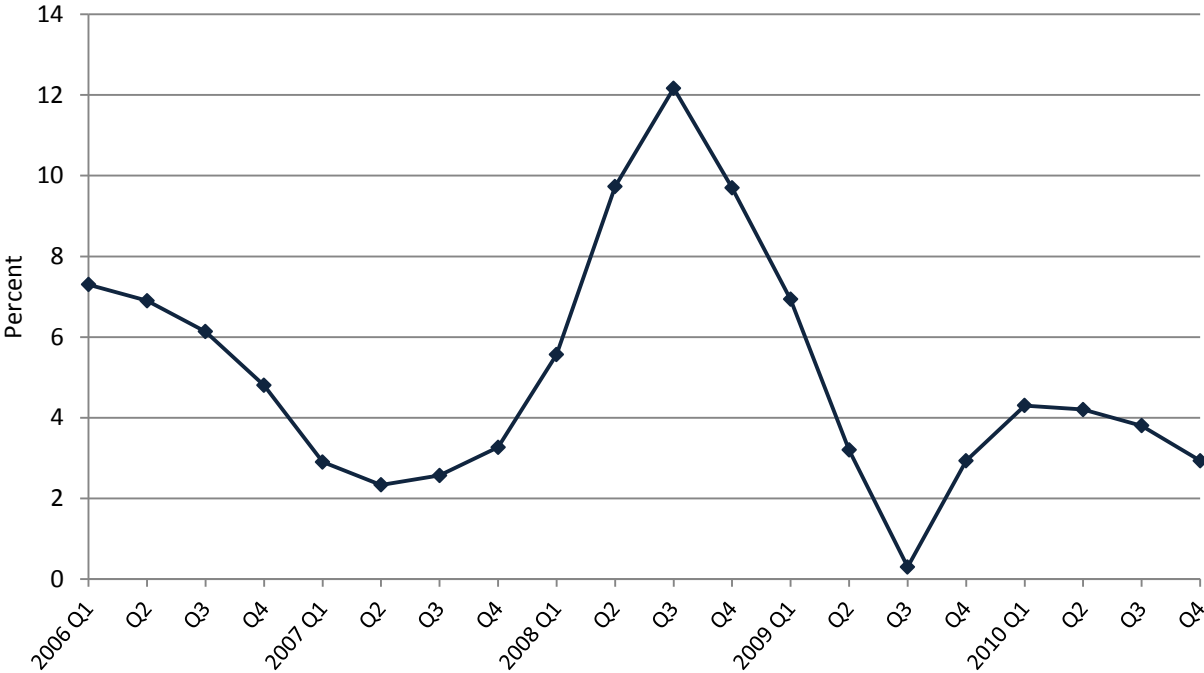Panel A. Real GDP Growth Rates
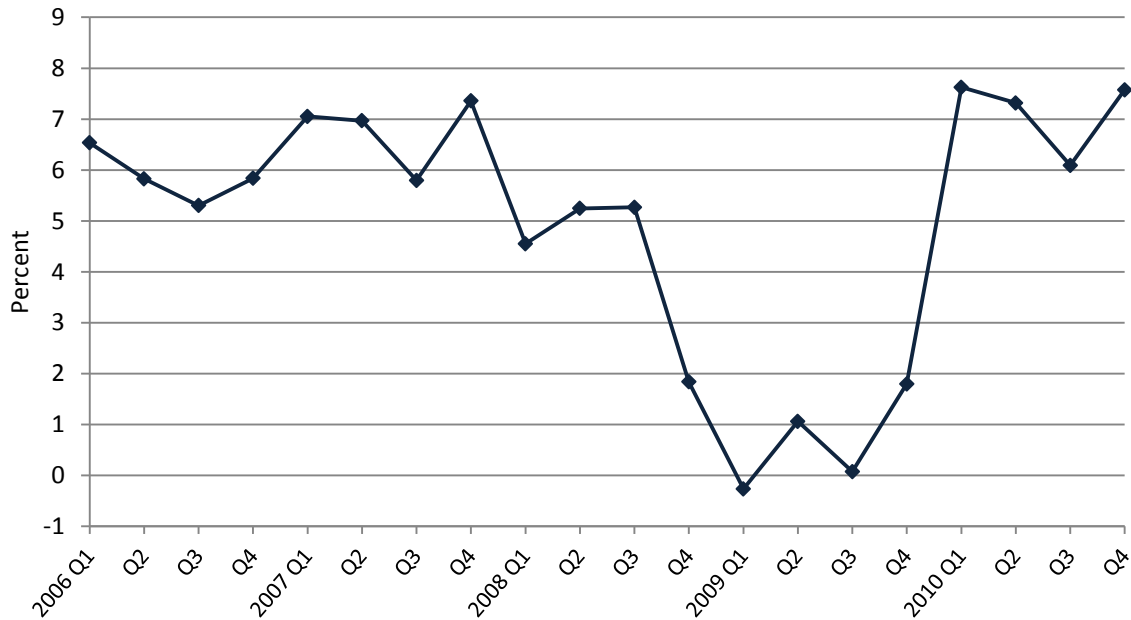


Panel B. Export Growth Rates
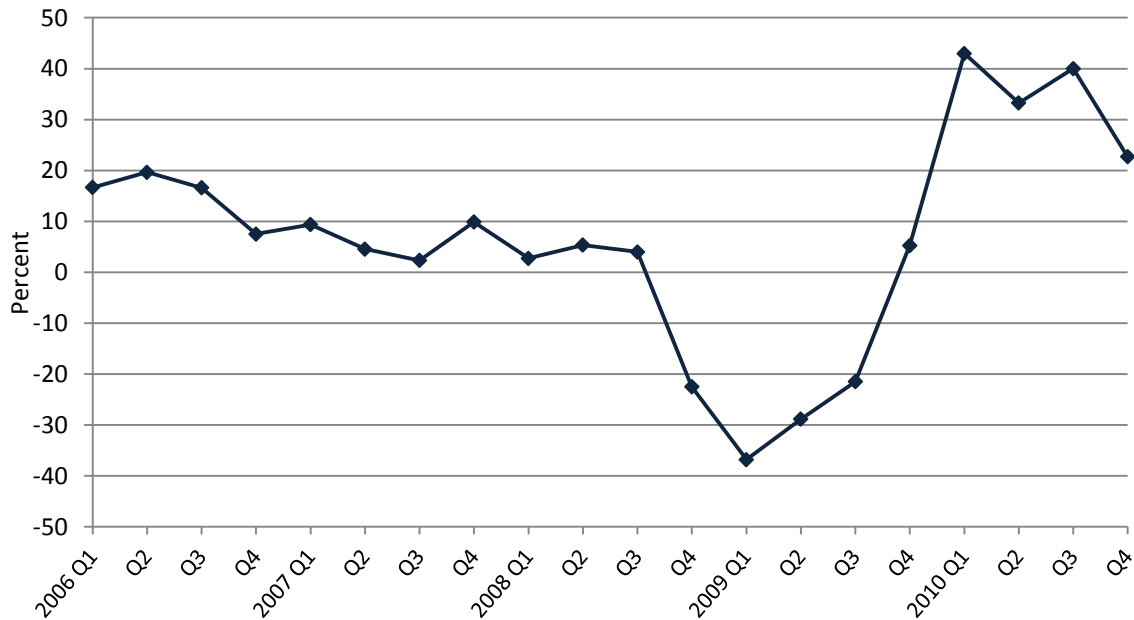


**Note:** Real GDP growth rates based on GDP in million pesos at constant 1985 prices. Export growth rates based on exports in millions of US dollars.
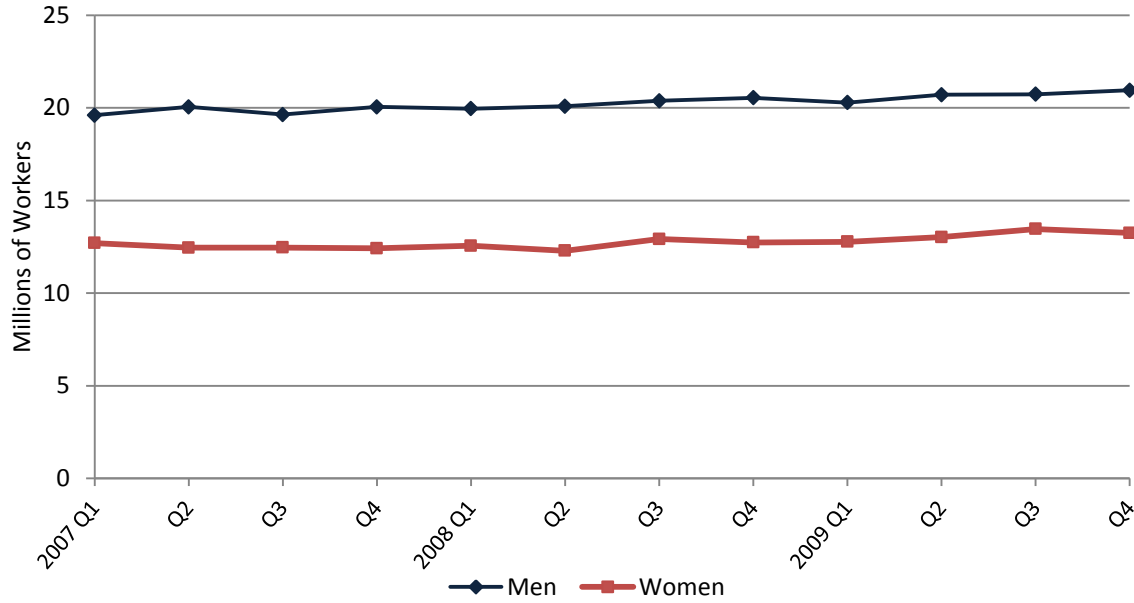**Source:** NSO (2012b, 2012c).

**Figure 2.** Inflation Rates for the Philippines, 2006-2010



**Note:** Inflation rates based on the Consumer Price Index.
**Source:** NSO (2012a).

**Figure 3.** Employment and Real Daily Wages by Gender, 2007-2009
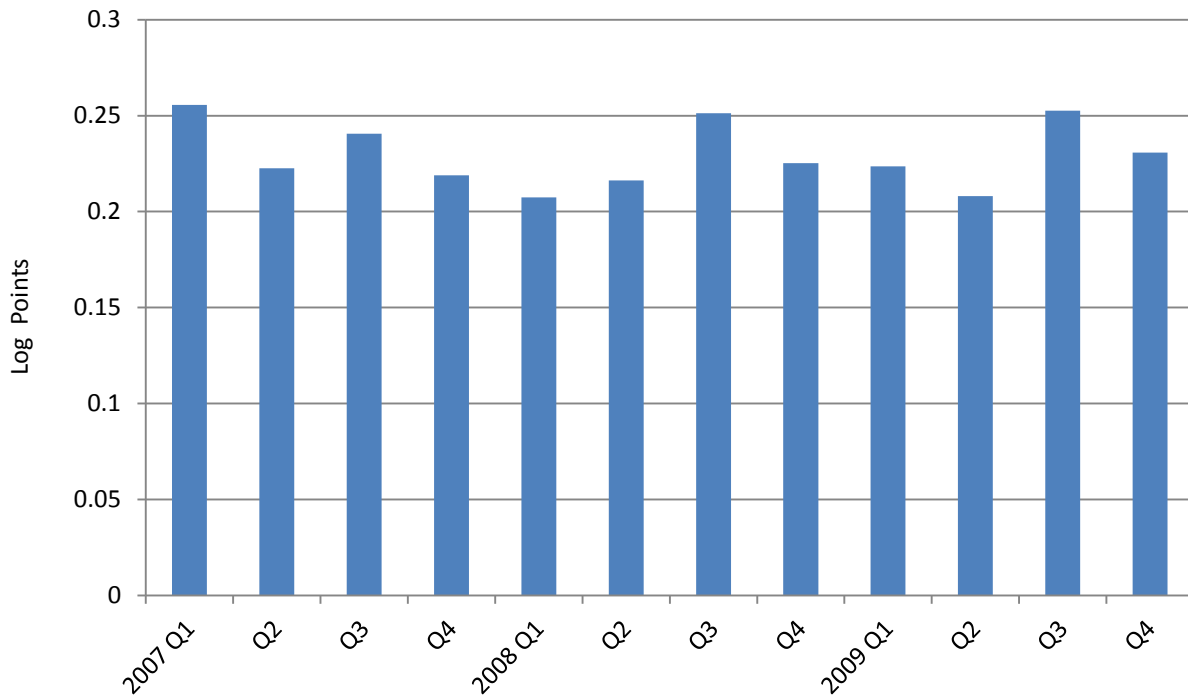
Panel A.  Employment



Panel B. Real Daily Wages



**Source:** Authors' calculations based on NSO (various years).

**Figure 4.** Residual Wage Gap, 2007-2009



**Note**: 2008 Q2 & 2008 Q3 correspond to the Food and Fuel Price Surge, 2008 Q4 and 2009 Q1 corresponds to the financial crisis.
**Source:** Authors' calculations based on NSO (various years).